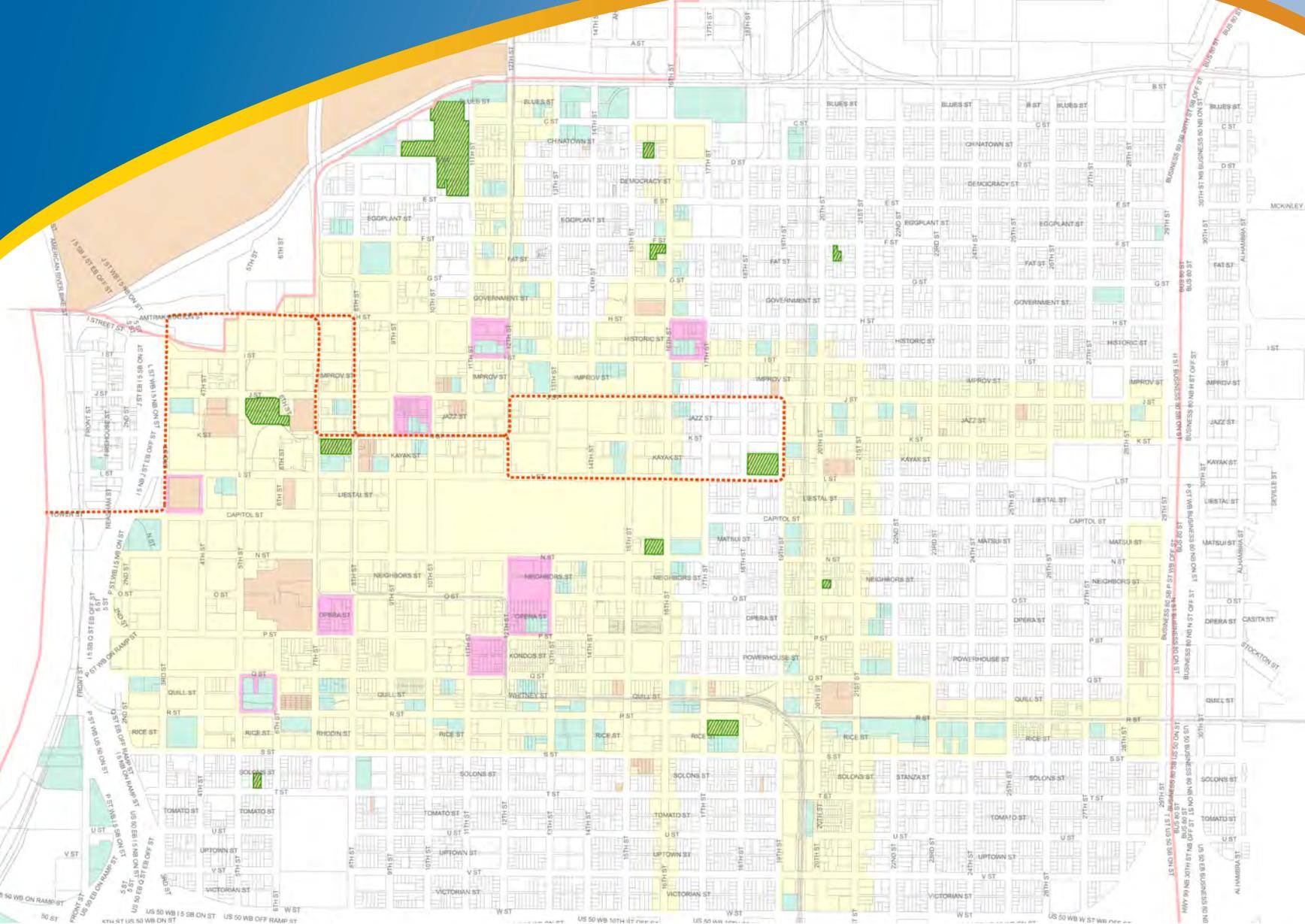


Central City Specific Plan Utility Infrastructure Analysis

SUBMITTED TO THE
City of Sacramento
Community Development Department

February 2018

NV5





FINAL REPORT FOR THE CENTRAL CITY SPECIFIC PLAN UTILITY INFRASTRUCTURE ANALYSIS

City Agreement #2016-0752

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INTRODUCTION

The 2030 General Plan adopted in March 3, 2009 (GP), set forth a new direction for the City of Sacramento (City). The GP set forth the Guiding Vision that “Sacramento be the most livable City in America.” Downtown Sacramento would be vibrant with arts, culture, entertainment, and a 24-hour population. The GP favored developing inward, rather than expanding outward through encouragement of infill development, and reuse of underutilized properties. The 2035 General Plan was a technical update of the 2030 General Plan and incorporated the City’s Climate Action Plan.

The Central City Specific Plan (CCSP) is proposed to create a predictable environment to encourage development, and increasingly housing, in the Central City through CEQA and regulatory streamlining combined with market, infrastructure, and historic analysis. The CCSP area is generally bounded by Broadway, Business 80, the American River, and the Sacramento River. Within this area are found previously developed Specific Plans for the River District, Railyards, and Docks Area.

This Utility Infrastructure Analysis will assist the City in attracting development to the Central City area. This analysis is a preliminary engineering, planning level effort that will aid the City and developers in creating a development fee structure to share the costs of improvements, attracting development funding assistance, and provide potential developers with information to evaluate their probable infrastructure costs. This study identifies potential opportunities to provide integrated infrastructure at least cost, through phasing options or the application of sustainable design principles and value engineering design considerations. The CCSP project area excludes the River District Specific Plan and Railyards Specific Plan areas and focuses on the Central City grid area south of B Street. Within the limits of the CCSP boundary, the City’s Community Development Department (CDD) has identified existing entitled projects together with vacant and underutilized opportunity sites that will likely be developed over the next 20 years. In total, these sites can potentially accommodate 13,400 dwelling units (du) and 3.8 million square feet with approximately 11,200 employees of employment growth within the CCSP area.

Opportunity sites located in the Central Business District (CBD), as defined by the GP, are assumed to have a development density of 165 du per acres (du/ac). Opportunity sites located along urban corridors, as defined by the GP, are assumed to have a development density of 100 du/ac. The other opportunity sites are assumed to have a development density of 30 du/ac. For non-residential uses, each opportunity site was assumed to be a mixed-use development with 120 square feet of commercial/retail/office per du.

In addition, several commercial/office only sites were identified that are likely to be developed as strictly non-residential sites. These sites are largely envisioned to accommodate additional State of California offices located in the Central City grid.

All of the currently active entitlement projects in the CCSP were included. However, the four entitled projects of Aura Condominiums, Cathedral Square, Metropolitan, and The Towers on Capitol Mall were assumed to have a development density of 150 du/ac rather than the number of units for which they were entitled.

Newly envisioned land uses for these sites will present added infrastructure demands. Existing sanitary sewer, storm drainage, water, electrical power, telecommunications, and natural gas infrastructure capacity must be analyzed to adequately serve these new demands. The location of each of the opportunity sites, entitled planning project sites, projects under construction, and commercial/office only sites are depicted in Figures 1A-1D: Land Use.

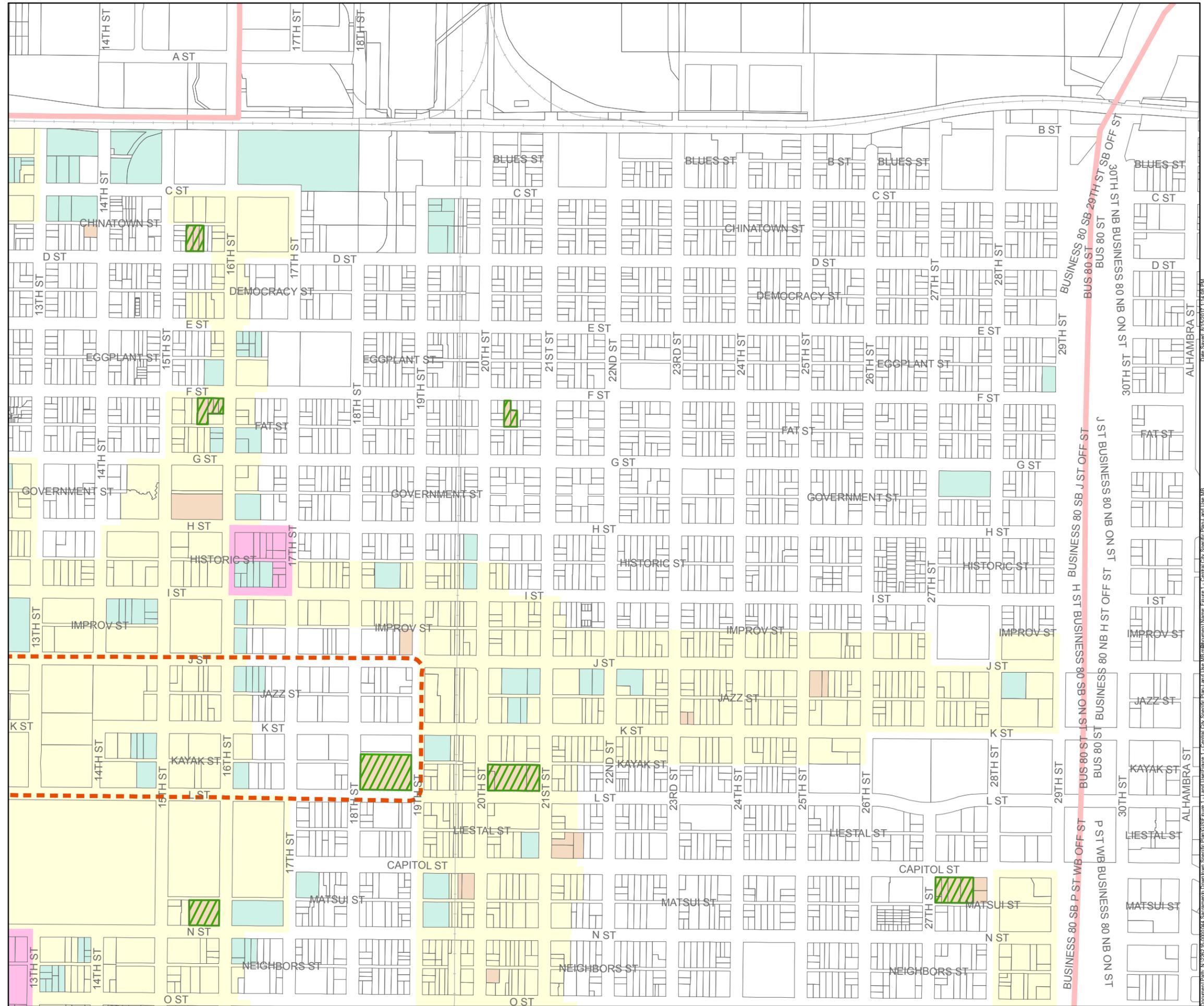
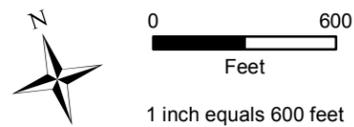
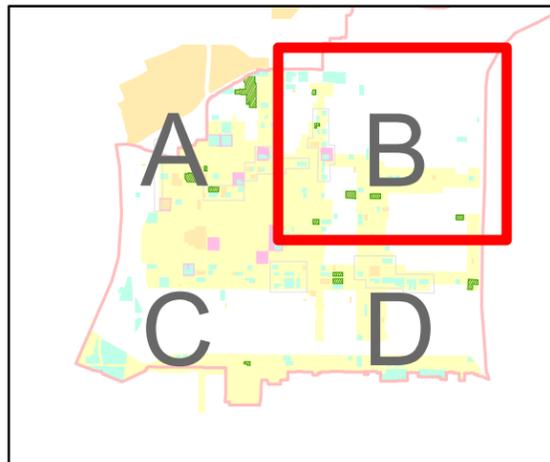
**Figure 1-B
Land Use**

Legend

Land Use

-  CCSP Boundary
-  Parcels
-  Opportunity Sites
-  Projects Under Construction
-  Planning Projects
-  Commercial/Office Only
-  Districts
-  Streetcar

Key Map



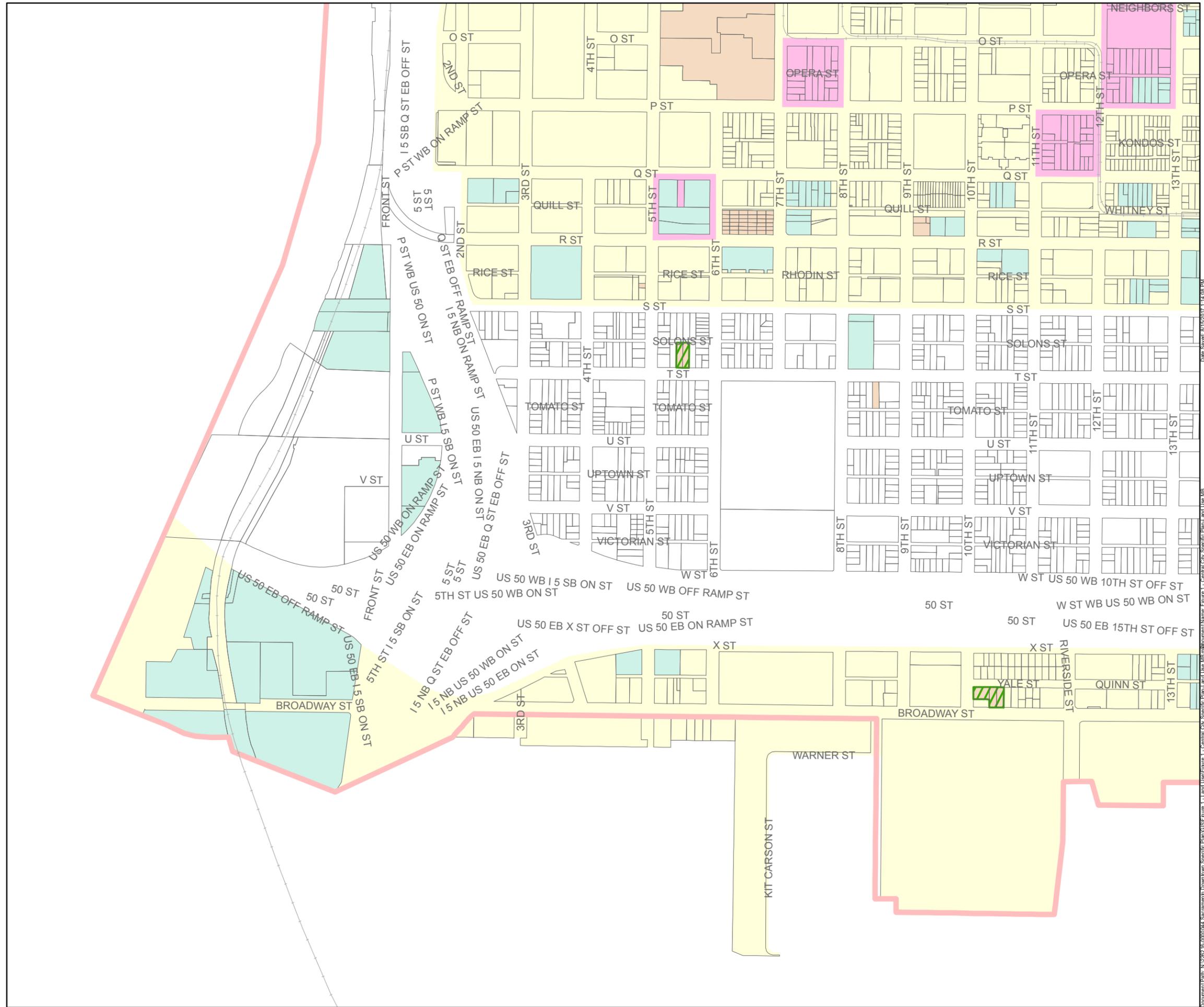
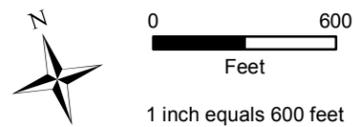
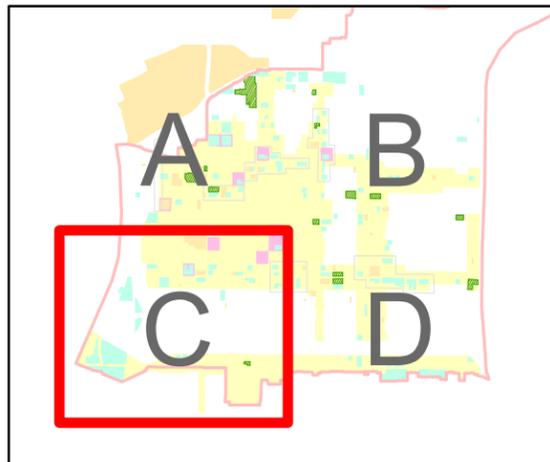
**Figure 1-C
Land Use**

Legend

Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

Key Map

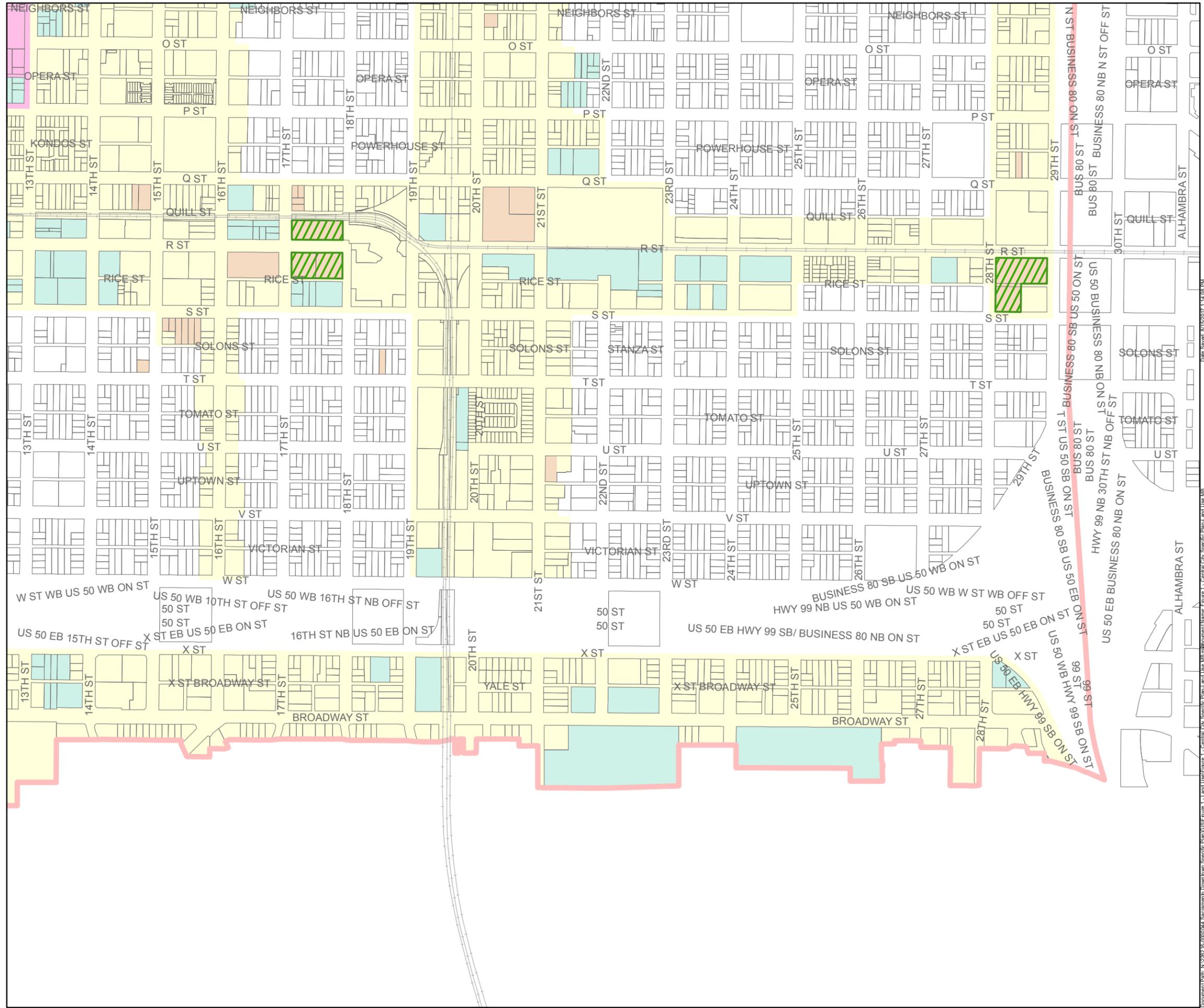


**Figure 1-D
Land Use**

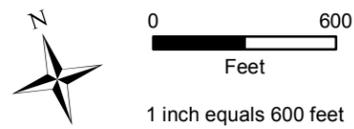
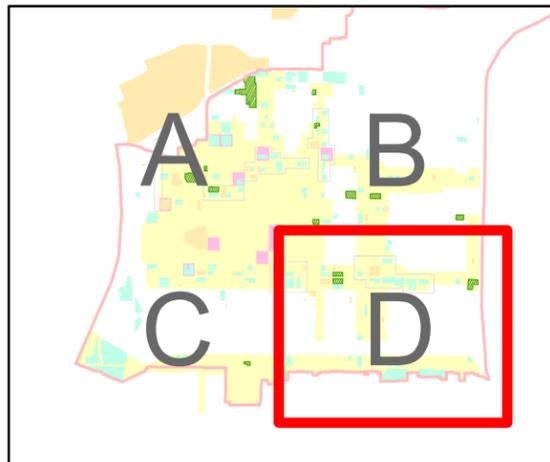
Legend

Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar



Key Map





STREET LIGHTS

General Information

The City Public Works Department maintains approximately 40,000 street lights within the City limits. This includes light varieties from the newest street lights installed in North Natomas to the lights in the older parts of the City that were installed over 80 years ago. The majority of lights in the City are High Pressure Sodium (HPS - the orange hued lights). Older lights still have Mercury Vapor lamps (white light) while newer lights may use energy efficient light emitting diodes (LED).

Within the CCSP there are approximately 3,400 street lights that are maintained by the City. There are an additional 250 lights that are owned and maintained by Sacramento Municipal Utility District (SMUD). There are 55 lights that are owned and maintained by Regional Transit (RT) along the light rail tracks on K Street between 7th and 12th and along O Street between 7th and 10th. The majority of these lights are the City's post top ornamental style light. There are also mast arm (aka, cobra head) style lights. The ornamental style lights are more aesthetically pleasing than the stark style of the mast arm style. However, the luminaires (light bulbs) in the ornamental lights are lower wattage than the mast arm style and therefore require more lights at a tighter spacing (typically four lights on each side of the street – total of eight lights per street block) to provide the desired level of lighting. The RT lights are a special dual luminaire and banner pole style. Example photographs of each type of street light within the CCSP are shown in Appendix A.

The City is currently replacing the existing HPS cobra-head style luminaires as they fail (burn out) with new energy efficient LED luminaires. The LED lights provide a brighter light than the comparable HPS lights. The LED luminaires are also slightly less expensive than the HPS and last longer. The HPS lights only have a life span of approximately 2 years while the LEDs are estimated to have a life span of up to 25 years. The City does not have the funds to replace all of the luminaires at once. The City is working on a LED replacement luminaire for the ornamental style lights.

The City has dedicated funding from Lighting Landscaping and Maintenance Districts (LLMDs) for the maintenance of existing street lights. Improvements to the existing street lights are also funded by the LLMDs. But, new lights are typically from grant funds, private funds, public-private partnerships, assessment districts, etc. The City typically has to assemble a variety of resources to pay for street lighting improvement projects.

The City has recently completed several street lighting projects within the CCSP including the Entertainment and Sports Center project, the Central City project, the Capitol Mall project, and several projects for the Handle District (a subset of the Mid-Town Association). The Riverfront Reconnection project and the R Street Market Place Phase 2 project are expected to be completed in 2017. The R Street Market Place Phase 3 project is anticipated to be completed in 2018.

The City does not have any other street lighting projects currently planned in the CCSP area, but is working with groups such as the Handle District to implement and fund other projects. These districts help provide a source of funding from contributions from their members/owners. The 16th Street Improvement project by the Capitol Area Development Authority (CADA) is currently applying for grant funding. CADA has also identified one other larger area bounded by 10th, N, 14th, and Q Streets that they are interested in improving the street lighting. None of these potential projects currently has confirmed funding.

The City has identified needed street lighting in two large, older, predominantly residential areas of the CCSP. These two areas are depicted as the Northeast CCSP – Street Light Area and the Southeast CCSP – Street Light Area in Figures 2A-2D: Street Lights. The proposed lighting in these areas is the ornamental style street lights.



Developers of projects in the CCSP area are typically required, as part of plan review, to improve the street lights along the street frontage of their project using ornamental style street lights. However, these lights are only installed on the development side of the street, not across the street, and not on the adjacent blocks.

Table 1 provides the quantities of each type of the existing street lights. The locations of the existing street lights together with the proposed developer-installed ornamental street lights needed to conform with the current development standards are depicted in Figures 2A-2D. These figures also show the locations of the City’s identified street light improvement areas together with the CADA potential project areas.

TABLE 1 - STREET LIGHTS

LIGHT TYPE	DOT	SMUD	RT
Mast Arm	1,520	0	0
Dual Mast Arm	4	0	0
Ornamental	1,659	0	0
Dual Ornamental	0	0	0
Post Top	5	0	0
Light & Banner Pole	0	0	55
Unknown	210	250	0
Total	3,398	250	55
Proposed Ornamental	694		

**Figure 2-A
Street Lights**

Legend

Proposed Street Lights

- Ornamental
- Existing Street Lights**
- Mast Arm
 - Ornamental
 - ▲ Dual Mast Arm
 - ▲ Post Top
 - ★ Light & Banner Pole

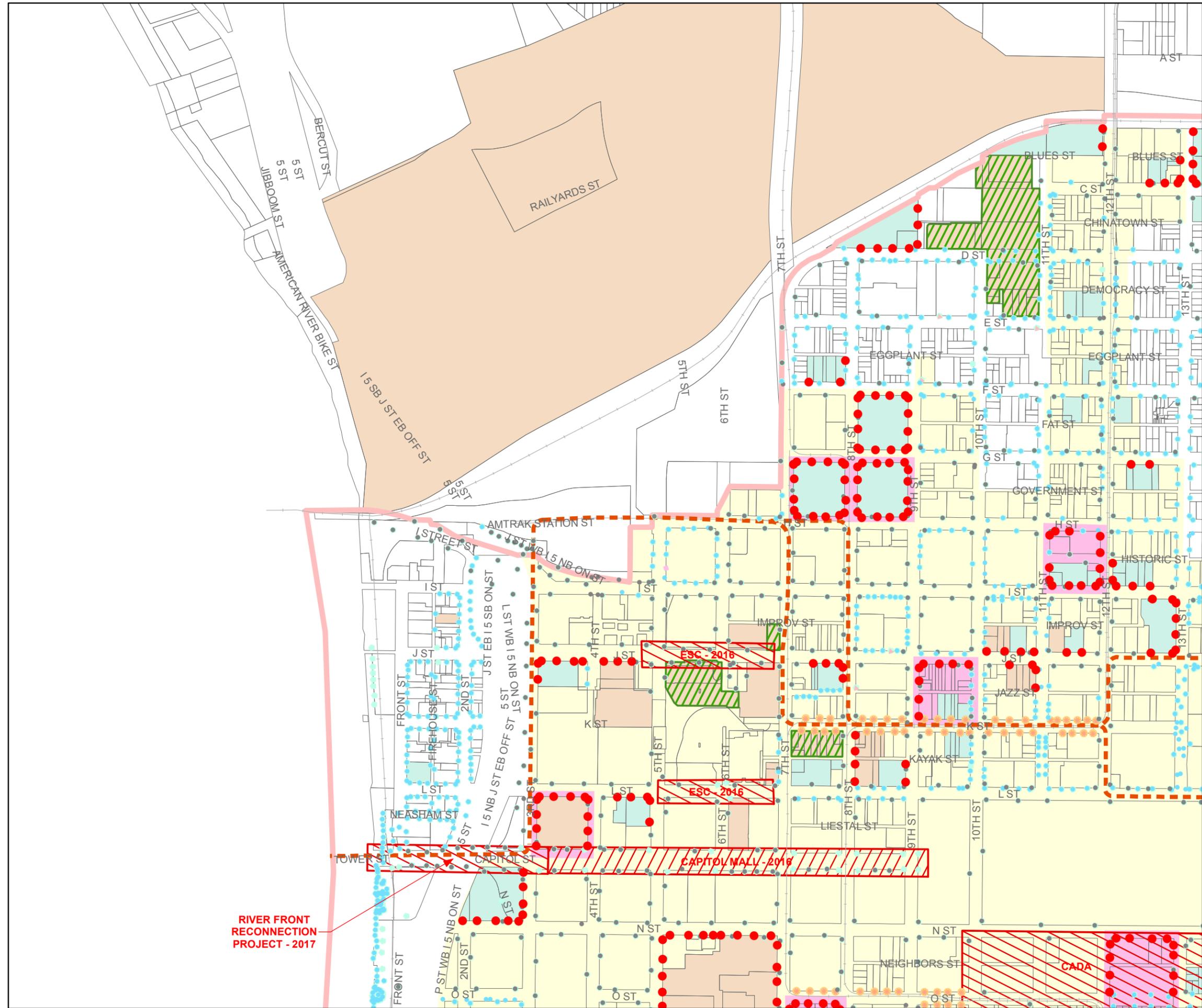
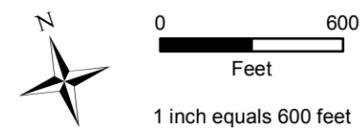
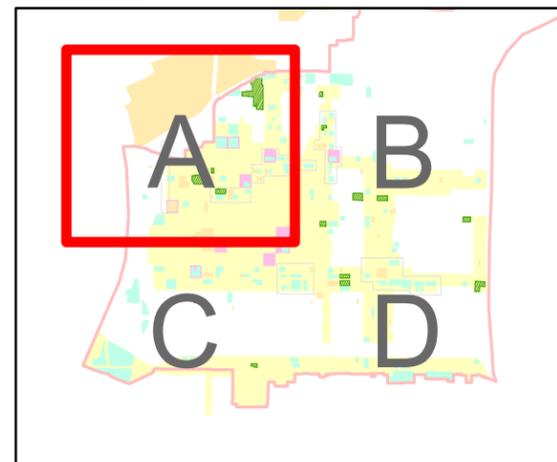
OWNER

- DOT
- SMUD
- Regional Transit
- ▨ Proposed Street Light Projects

Land Use

- ▭ CCSP Boundary
- ▭ Parcels
- ▭ Opportunity Sites
- ▨ Projects Under Construction
- ▭ Planning Projects
- ▭ Commercial/Office Only
- ▭ Districts
- ▭ Streetcar

Key Map



**Figure 2-B
Street Lights**

Legend

Proposed Street Lights

- Ornamental

Existing Street Lights

- Mast Arm
- Ornamental
- ▲ Dual Mast Arm
- ▲ Post Top
- ★ Light & Banner Pole

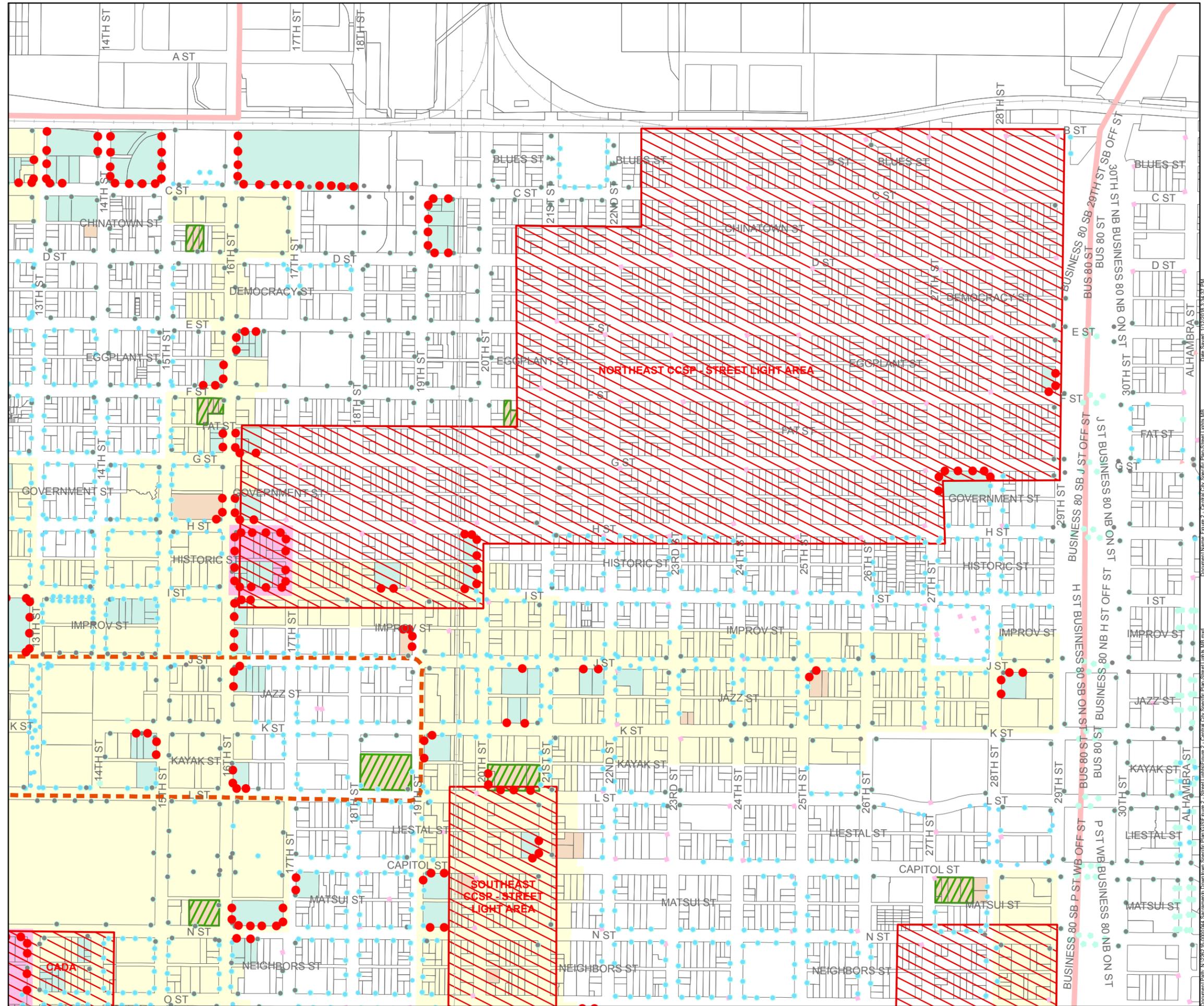
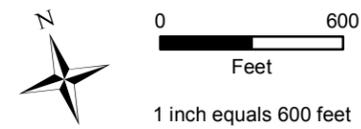
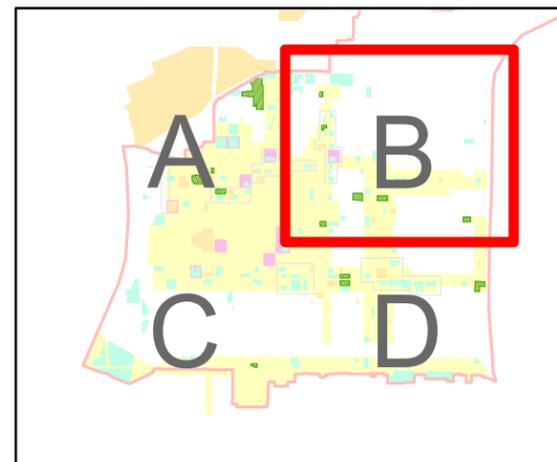
OWNER

- DOT
- SMUD
- Regional Transit
- ▨ Proposed Street Light Projects

Land Use

- ▭ CCSP Boundary
- ▭ Parcels
- ▭ Opportunity Sites
- ▨ Projects Under Construction
- ▭ Planning Projects
- ▭ Commercial/Office Only
- ▭ Districts
- ▭ Streetcar

Key Map



**Figure 2-C
Street Lights**

Legend

Proposed Street Lights

- Ornamental

Existing Street Lights

- Mast Arm
- Ornamental
- ▲ Dual Mast Arm
- ▲ Post Top
- ★ Light & Banner Pole

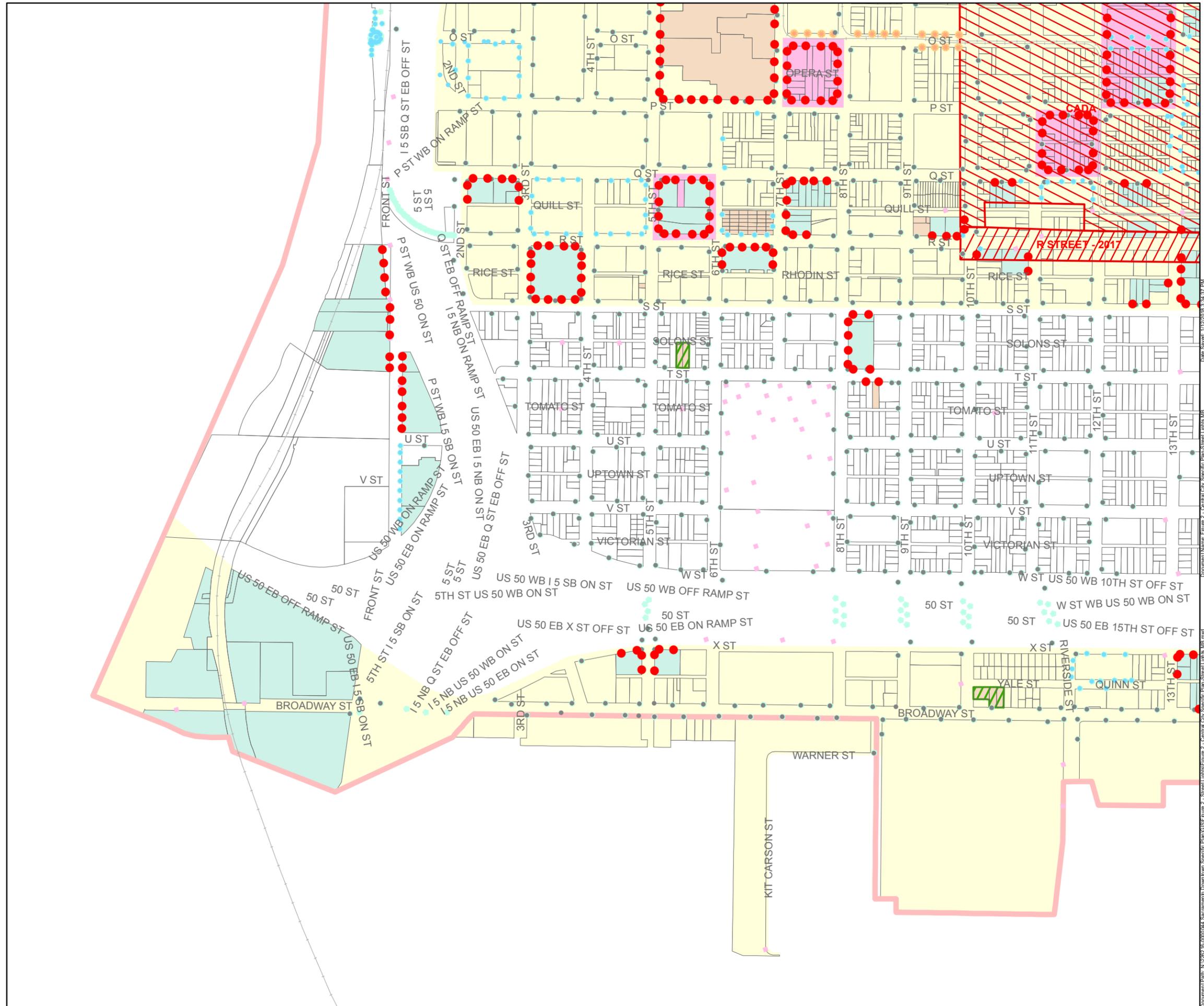
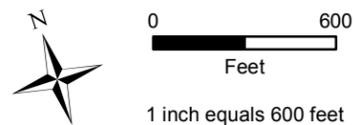
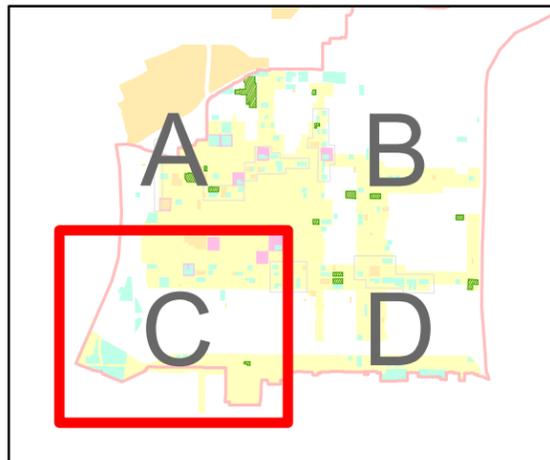
OWNER

- DOT
- SMUD
- Regional Transit
- ▨ Proposed Street Light Projects

Land Use

- ▨ CCSP Boundary
- ▨ Parcels
- ▨ Opportunity Sites
- ▨ Projects Under Construction
- ▨ Planning Projects
- ▨ Commercial/Office Only
- ▨ Districts
- ▨ Streetcar

Key Map



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**Figure 2-D
Street Lights**

Legend

Proposed Street Lights

- Ornamental

Existing Street Lights

- Mast Arm
- Ornamental
- ▲ Dual Mast Arm
- ▲ Post Top
- ★ Light & Banner Pole

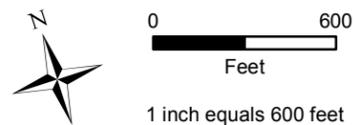
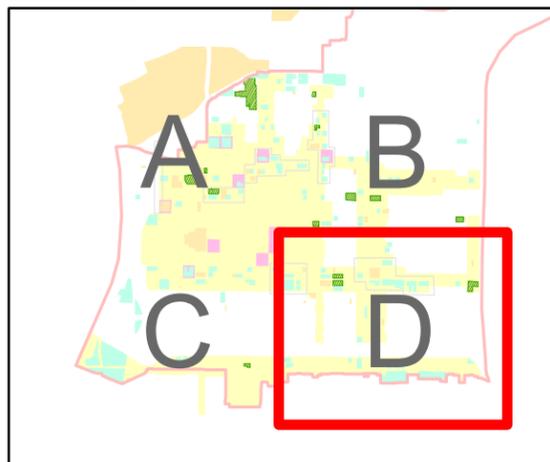
OWNER

- DOT
- SMUD
- Regional Transit
- ▭ Proposed Street Light Projects

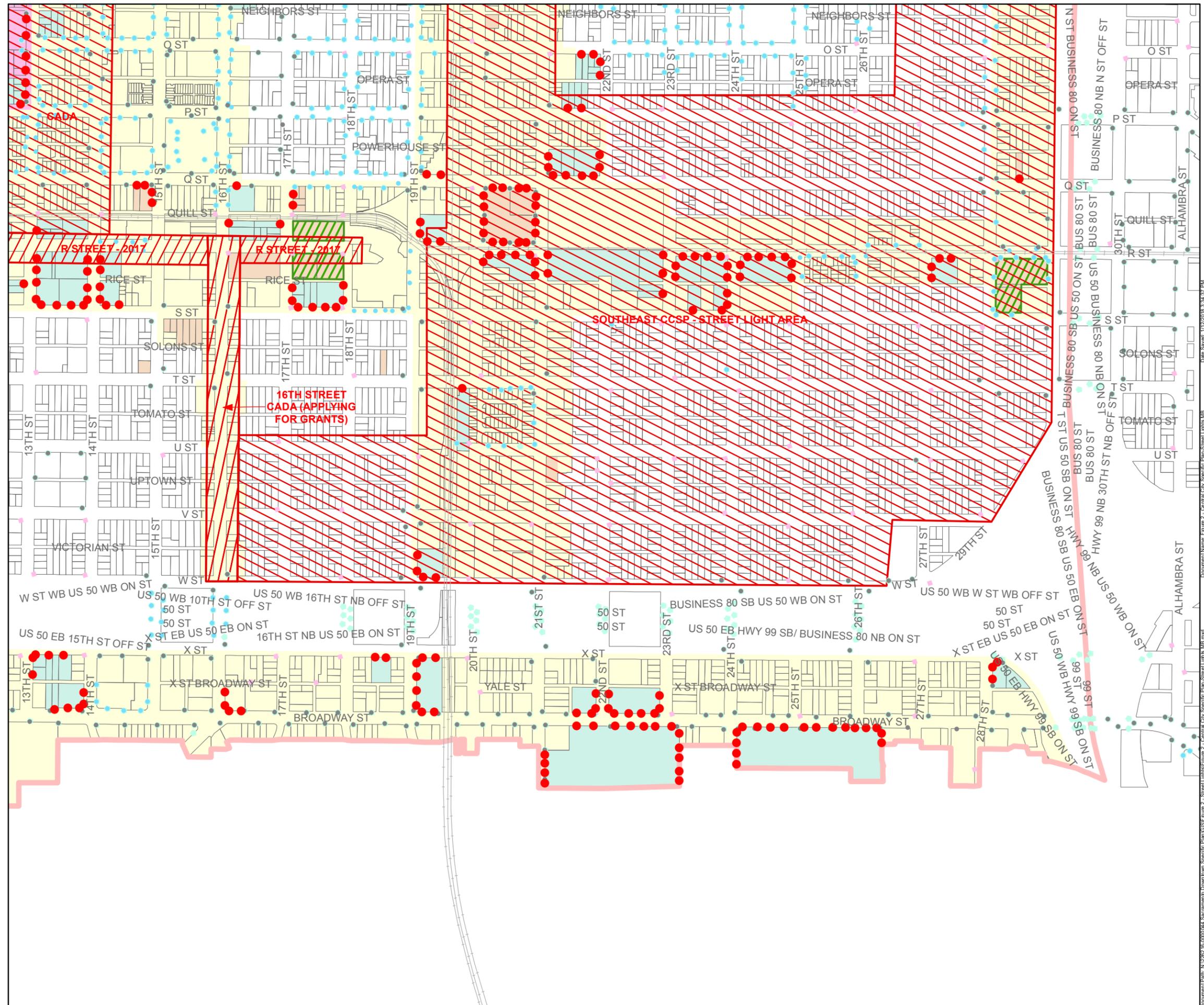
Land Use

- ▭ CCSP Boundary
- ▭ Parcels
- ▭ Opportunity Sites
- ▭ Projects Under Construction
- ▭ Planning Projects
- ▭ Commercial/Office Only
- ▭ Districts
- ▭ Streetcar

Key Map



N V 5





WASTEWATER & STORM DRAINAGE

General Information

The CCSP is served by both the Combined Sewer System (CSS) and Storm Drainage Basin 52 (Basin 52). The CSS is the legacy storm drain and sanitary sewer system that conveys both stormwater and sanitary flows. It encompasses approximately 7,500 acres of the Downtown, East Sacramento, and Land Park areas. Another 3,700 acres including the River Park, California State University, and eastern Sacramento areas utilize the system for sanitary sewer only. The City discontinued constructing combined sewer and storm systems in 1946, although continued connections to the existing CSS were allowed.

The City storm drainage requirements are handled by numerous drainage basins. Most of these basins are located outside of the CSS area. Basin 52 provides a separated storm drainage collection system in the westerly portion of the CCSP area. Storm drainage within this area is gravity piped to the pump station (Pump Station 52) located near the Crocker Museum. The pump station discharges directly to the Sacramento River. Sanitary sewer piping from the Basin 52 area is collected with a separated gravity system and connected to the CSS.

Combined Sewer System

The CSS is a collection system of pipes that convey both sanitary sewage and stormwater in a single pipeline. The piping system is greatly oversized for the sanitary sewer component, but inadequate for the City's current storm drainage design standard of 10-year capacity.

The CSS area is currently regulated by the Central Valley Regional Water Quality Control Board (RWQCB) per Cease and Desist Order No. 85-342 (Order). The Order, including its amendments, requires the City to make operational improvements to reduce combined sewer and runoff overflows and to ultimately provide 10-year capacity for the CSS.

The CSS is plagued by combined sewer outflows (CSO) and overflows where flows to the CSS exceed the system capacity. Outflows are when surcharges to the CSS flow onto the streets. Overflows are defined as the rare instances when untreated flows discharge to the Sacramento River. Outflows and the rare overflow usually occur only during heavy rainfall storm events.

The City has developed an improvement program to reduce CSO events. These improvements include rehabilitating and expanding Sumps 1/1A and 2, rehabilitating and converting Pioneer Reservoir into a treatment facility, rehabilitating and up-sizing of the sewer mains in the CSS, and rehabilitating the Combined Wastewater Treatment Plant (CWTP). Many of these projects have been completed.

Currently all flows into the CSS are conveyed westerly to two pumping stations (Sump 2 and 1/1A) located on the Sacramento River. For secondary treatment and disinfection of the flow, the City has entered into an agreement with the Sacramento Regional Wastewater Treatment Plant (SRWTP) to convey 60 million gallons per day (mgd). This treatment capacity is currently sufficient for dry weather flows.

During heavy storms where the capacity is exceeded, the CWTP at South Land Park Drive and 35th Avenue is utilized to provide primary treatment of an additional 130 mgd. Excess flows from SRWTP and CWTP are diverted to the Pioneer Reservoir storage and treatment facility that has a capacity of 350 mgd. When all three treatment facilities (SRWTP, CWTP, and Pioneer) have reached capacity, excess flows are directly discharged into the Sacramento River without treatment from Sump 2. Sump 1 also has the ability to discharge flows directly to the river. When the pipeline system and treatment plant capacities are surpassed, the excess flows flood local streets in the Downtown area through maintenance holes and catch basins.



The City prepared a Combined Sewer System Improvement Plan (CSSIP) Update Report dated August 2014. This CSSIP Update Report is an ongoing, multi-year project intended to evaluate and provide recommendations for projects to alleviate flooding in the CSS area during a 10-year event and to prevent structure flooding during the 100-year event. The CSSIP Update Report analysis of the system improvements includes an allowance of increased sewer flows from future development. Recommendations for specific project improvements that provide localized or system-wide reductions to flooding have been identified. The projects are prioritized based on considerations such as flood-reduction benefits, cost-effectiveness, ensuring no increase in untreated discharges, sewer condition/age, cost-sharing opportunities, and City/community interests.

The City adopted the Combined Sewer Development Fee (City Code 13.08.490) which is an impact mitigation fee that requires mitigation of any significant increase in wastewater flows over the present level. If a proposed development project is determined to have a significant impact on the CSS, an acceptable mitigation plan is required by the City. The current CSS Development Fee is \$130.31 per ESD for up to 25 ESD and \$3,251.72 per ESD for more than 25 ESDs. The payment of the fees mitigates the project's sewer impacts.

In lieu of paying the fees, a developer may mitigate the impacts to the system with a mitigation plan approved by the City Department of Utilities (DOU). The mitigation plan could include on-site storage with retention, sewer main up-sizing, diversion of flows, rerouting or replacement of pipes, connection to separated areas, and/or other mitigation measures depending on the site.

The City offers an incentive through their Economic Development Treatment Capacity Bank Sewer Credits program providing credits that reduce sewer connection fees for commercial, new construction and residential homeowner projects. The program's objective is to provide economic incentives for commercial and industrial sewer customers and facilitate new employment opportunities. A copy of the program application can be obtained at <http://www.cityofsacramento.org/Economic-Development/Grow-Here/Incentives>.

There is a second fee associated with the sanitary sewer system, the Facility Impact Fee levied by the Sacramento Regional County Sanitation District (SRCSD). This fee pays for planning, designing, construction, and other related costs for wastewater conveyance, treatment, and disposal facilities for system expansion.

The SRCSD Facility Impact Fee currently is calculated by multiplying the ESDs generated by the development by the fee of \$3,358 per ESD for infill projects. It is possible in certain cases to receive a credit of 1 ESD per parcel as credit for previously paid fees. Sacramento County (County) policy determines when the credit is allowed. The County has published the method of calculating the ESDs for the different types of development. Additional information is available on line at <http://www.srcsd.com>.

Storm Drain – Basin 52

Basin 52 serves the storm drainage needs of approximately 320 acres, bounded generally by the tracks north of I Street, the Sacramento River, S Street, and 7th and 10th Streets. There are two additional smaller storm drainage basins, Basins 73 and 114, that are pumped into the Basin 52 system and are generally considered part of the larger Basin 52 system for planning purposes.

Basin 114 serves the area bounded by 3rd to 5th Streets and I to J Street. The sump for Basin 114 is located near at the intersection of 4th and J Streets. Basin 73 serves the depressed section of 5th Street from J Street to L Street. The sump for Basin 73 is located just west of 5th Street in Downtown Plaza. These combined basins discharge stormwater through the levee into the Sacramento River at Sump 52, located at the Crocker Museum site at 3rd and P Streets. The limits of each of these Basins (52, 73, and 114) together with the CSS are shown on Figures 3A-3D: Wastewater & Storm Drainage.



Basin 52 utilizes a system of pipelines conveying stormwater to Sump 52. The system is currently over capacity and allows fairly significant street flooding even during a 2-year storm event. This flooding is comprised only of stormwater, not sanitary sewage. Property flooding for at-grade structures is only anticipated during the 100-year storm event, although underground structures are at risk during smaller storm events.

The Basin 52 Stormwater Master Plan dated May 1996 has determined the recommended improvements for the shed area. The improvements include construction of a new pump station and storage basin, new outfall lines to the river, upsizing 8,800 feet of pipe, and replacement in kind of 3,300 feet of pipe as the life cycle requires. The City DOU is currently preparing an update of the Basin 52 Stormwater Master Plan with their consultant AECOM. A draft of the initial report was made available for review for this CCSP report. The findings in the updated Basin 52 Stormwater Master Plan are preliminary and are therefore subject to change as the Master Plan report is finalized over the coming months.

Existing Conditions

Combined Sewer System

The CSS that serves both the sanitary sewage and much of the stormwater needs of the area consists of pipes ranging in size from 4-inches to 120-inches in diameter. The largest pipe in the CSS is the 120-inch Pioneer Interceptor (force main) which conveys flows from Sump 2 to Pioneer Reservoir. Piping material includes brick, polyvinyl chloride (PVC), reinforced concrete pipe (RCP), and vitrified clay pipe (VCP). Flows for the system are through the CCSP area and are generally from the north to the south.

The local drainage and sanitary sewage is typically collected in 8-inch to 12-inch piping systems located in the alleyways and streets. The collection system has collector pipelines ranging in size from 24-inch to 36-inch diameter.

The City has recently completed the majority of the Downtown Combined Sewers Upsizing project. This project added significant capacity to the CSS with the installation of large diameter pipelines ranging in size from 36-inches to 84-inches on U, P, S, 5th, and 7th Streets.

Storm Drain - Basin 52

The Basin 52 piping system ranges from 12-inches to 54-inches in diameter. The larger collection mains are located in 3rd Street, 4th Street, and 7th Streets. The system generally flows southwesterly towards the Basin 52 Pump Station located adjacent to the Crocker Museum at the corner of 3rd and P Streets.

Proposed Improvements

Combined Sewer System

The CCSP area is largely developed at this time with a variety of land uses including office, commercial, and residential. The majority of the opportunity sites and entitled planning projects sites are envisioned as redevelopment projects consisting of mixed-use land uses that incorporate a combination of residential, office, and commercial/retail uses. Sanitary sewer flows are expected to increase because of the future increased density of office, commercial, and residential land uses. Since the majority of the sites are previously developed with highly impervious surfaces (i.e.; roof tops, parking lots, sidewalks, etc.), the stormwater runoff flows from the projects are not anticipated to increase with the new development. The increased sanitary sewer flows are anticipated to be relatively small compared to the stormwater component of the CSS design flows.

Sanitary Sewer: The anticipated future development in the CCSP area is expected to increase the sanitary sewer flows due to the increase in the residential, office, and commercial uses. The addition of



over 13,400 new residences and almost 3.8 million square feet of office/commercial/retail uses will affect the existing sewer system.

The City of Sacramento Design Standards for sewer generation rates (Section 9 – Sanitary Sewer Design Standards) contain average daily flow rates for residential and non-residential uses. The existing standard for sewer generation is 400 gallons per day (gpd) per ESD. The City DOU is currently in the process of revising these Design Standards. The new standards are anticipated to be adopted by Fall 2017.

For more recent planning studies, the City has used a lower generation rate of 310 gpd per ESD. This is based on the stricter water usage construction standards limiting the flow per fixture unit that have been adopted over the last decade. With the State's adoption of CalGreen construction standards, even further reductions will be realized. However, this lower generation rate has not been formally adopted as the City standard and is therefore subject to change.

A factor of 0.55 ESD per residential unit was selected based on the nature of the high-density, urban infill residential. The factor is consistent with other recent planning studies for the Railyards Specific Plan and the River District Specific Plan. This factor when multiplied by 310 gpd per ESD yields a sewer generation rate of 170 gpd per residential unit. This factor has not been formally adopted as the City standard and is therefore subject to change.

For the non-residential land uses, the City standards recommend 0.2 ESD per 1,000 square feet for general office/commercial buildings. This generation rate has been applied to both the Office and Commercial/Retail land uses and yields a rate of 62 gpd per 1,000 square feet.

Given the anticipated development of 13,400 dwellings units in the CCSP area, the anticipated increase in the residential Average Dry Weather Flow (ADWF) is 2.28 mgd (13,400 DUs x 0.55 ESDs x 310 gpd/ESD). The anticipated development of 3.8 million square feet of commercial/office/retail space is anticipated to increase the ADWF by 0.24 mgd (3.8 million square feet x 0.2 ESD/1000 square feet x 310 gpd/ESD). The total anticipated increase in the ADWF for the CCSP area is 2.52 mgd.

The City requires the developer to mitigate the increased sewer flows. The City will consider one of the following approaches to mitigate the impacts:

1. Project developer pays the established CSS mitigation fee.
2. At the City's discretion, the project developer can participate in a City-sponsored project that improves the system in the area and can be upsized to incorporate mitigation of the project. A separate cost sharing agreement shall be executed for this option.

The stormwater runoff characteristics of the current and proposed land uses are similar. As a result, the peak stormwater flow rate and volume of rainfall-runoff is not expected to significantly change when the land use changes. The City requires the developer to mitigate the increased drainage flows. The City will consider one of the following approaches to mitigate the impacts:

1. Project developer pays the proposed CSS drainage impact fee. This fee was calculated to be \$6.89 per square foot of increased imperviousness in 2015.
2. Project developer directly mitigates the impacts utilizing low impact development Best Management Practices (BMPs).
3. Project developer directly mitigates the impacts via an on-site or off-site improvement as determined by a Drainage Design Report.
4. For projects disturbing less than 2 acres, project developer prepares a Drainage Design Report and provides a minimum of 7,600 cubic-feet of on-site storage per acre of increased impervious area. The maximum discharge flow rate from the on-site storage would be required to be limited to 0.18 cubic feet per second (cfs) per acre.



5. At the City’s discretion, project developer can share in a City-sponsored project that improves the system in the area and can be upsized to incorporate mitigation of the project. A separate cost sharing agreement shall be executed for this option.

Recommended System Improvements: The updated CSSIP has recommend eleven projects located within the CCSP area. The following is a list of these projects:

1. WA1-1: Zapata Park
2. WA1-2: G and 9th Street Parking Lot
3. WA1-3: 9th Street from G to L Street
4. WA1-4: 14th Street Storage
5. WA1-5: N and 22nd Street
6. WA1-6: 24th Street Storage
7. WA1-7: Grant Park Storage
8. WA5-1: T and 20th Street Pipe Installation
9. WA5-2: 28th and T/U Alley
10. WA5-3: W and 25th Street Storage
11. WA3-7: Target Parking Storage

A twelfth project, WA6-2 Riverside Boulevard Upsizing, is partially located within the CCSP area with the upper reaches of the pipe system improvements located on Broadway and Riverside.

In addition to these CSSIP projects, improvements specific to the locations of the opportunity sites, entitled planning projects sites, projects under construction, and commercial/office only sites have been conceptually identified and are depicted in Figures 3A-3D: Wastewater & Storm Drainage. No detailed design analysis was performed. The existing system is generally comprised of 6-inch to 10-inch pipelines in the alleys and streets. These pipelines, while more than adequately sized for the sanitary sewer flows, are typically undersized for the added storm drainage flows during a rainfall event. The proposed system would upsize the existing pipe or add a separate 18-inch storm drain pipeline to the system. Adding an 18-inch pipeline to an existing alley or street may prove difficult and will need to be analyzed on a project by project basis.

Storm Drain - Basin 52

The construction of the improvements identified in the Basin 52 Master Plan is not required to be constructed by the developers within the CCSP area by current City policy. However, the system improvements have been included in this CCSP report and included in the cost estimate.

The costs for these improvements are currently not included in the City Capital Improvement Program (CIP), and a funding source has not yet been identified. If a financial plan to fund the improvements is developed in the future, developers in the CCSP area within the limits of the Basin 52 watershed would be expected to pay their proportionate share.

3rd Street CSS Relief Sewer Project

The upsizing of the existing 3rd Street CSS sanitary sewer system was studied by NV5 (formerly Nolte) for the City Utility Department in 2007. An update of this report was prepared by NV5 in 2015. This pipeline conveys primarily sanitary sewer flows with some existing storm drainage flows entering the system at the Railyards project. With the development in the Railyards Specific Plan area, it is intended



that the majority of the stormwater flows will be conveyed directly to the Sacramento River with the construction of a new stormwater collection system and pump station. The increased sewer flows from the Railyards development together with diverted sewer flows from the River District Specific Plan area and development along 3rd Street will require the existing 3rd Street CSS pipeline to be upsized.

The 3rd CSS project is currently under design with construction anticipated to occur in 2018. The construction of the improvements identified in the 3rd Street CSS Relief Sewer Project is not required to be constructed by the developers in the CCSP area by current City policy. However, the 3rd Street CSS Relief Sewer system is included in the cost estimate.

The proposed CSSIP, 3rd Street CSS, Basin 52, together with the locations of the 18-inch CSS pipelines are depicted in Figures 3A-3D: Wastewater & Storm Drainage.

Stormwater Quality

The City adopted the Stormwater Quality Design Manual (SQDM) for the Sacramento and South Placer Regions (May 2007), a joint effort of the communities in the greater Sacramento region. The SQMD provides locally-adapted information for design and selection of three categories of stormwater quality control measures: source control, runoff reduction, and treatment control. Per the requirements, multi-family and commercial projects greater than 1 acre are required to implement permanent post-construction treatment measures.

The CCSP area is subject to the requirements of the SQDM only for those projects that fall within the boundary of Basin 52. All projects greater than 1 acre will be required to comply with the stormwater quality measures outlined in the SQMD. These measures may include treatment measures such as bioswale planters, stormwater treatment vaults, green roofs, etc. – either used as a single treatment or as a combination of several measures. Developers are urged to discuss their project with the Stormwater Quality Section of the City DOU while in the planning stages so that proper permanent post-construction stormwater quality treatment measures can be effectively implemented into the project.

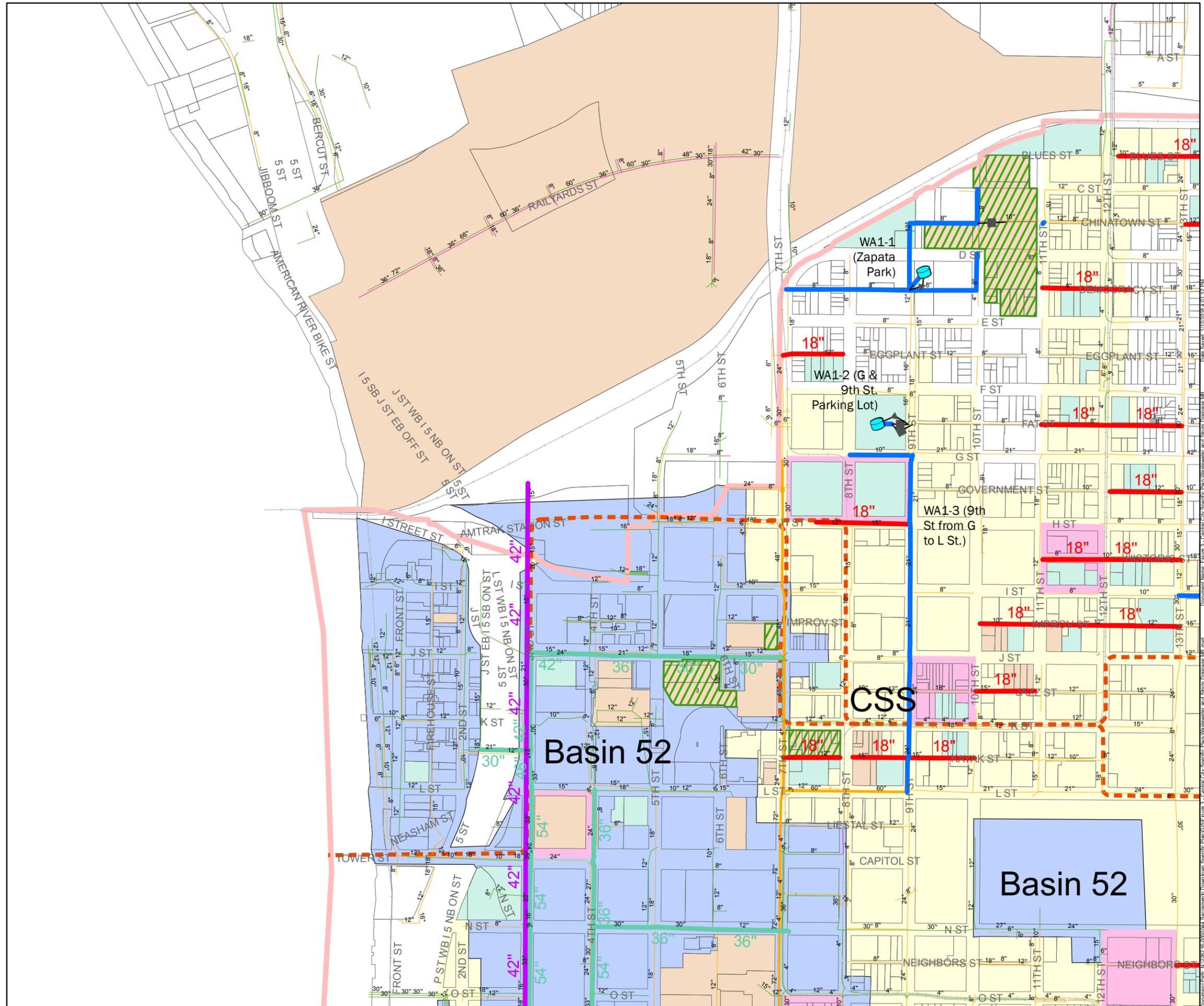
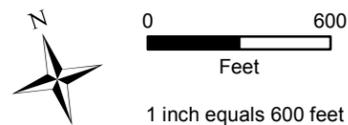
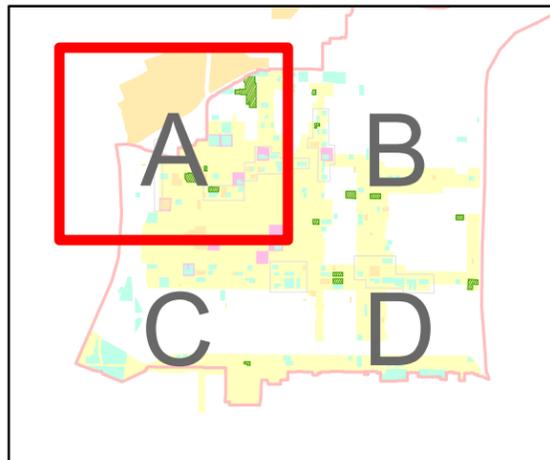
The remainder of the CCSP area is within the CSS, which is under separate permit regulations for stormwater discharges. The stormwater flows from the CSS are treated at the SRWTP, CWTP, and the Pioneer treatment facilities. Therefore, projects within the CSS are not required to have additional stormwater quality control measures.

**Figure 3-A
Wastewater & Storm Drainage**

Legend

-  Storage
-  Flap Valve/Gate
-  Pumps
-  Weirs
- Proposed Improvements**
-  CIP
-  CSSIP Sewer Pipes
-  3rd Street CSS
-  CSS Development Specific
-  Basin 52-Alternative 2
- Existing Mains**
-  Drainage
-  Sewer
-  Combined Sewer
-  Completed CSS Upsizing
- Land Use**
-  CCSP Boundary
-  Parcels
-  Opportunity Sites
-  Projects Under Construction
-  Planning Projects
-  Commercial/Office Only
-  Districts
-  Basin 52
-  Streetcar

Key Map

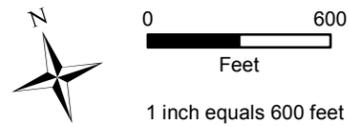
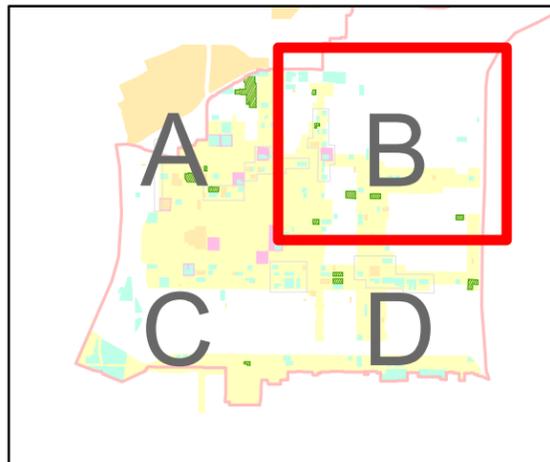


**Figure 3-B
Wastewater & Storm Drainage**

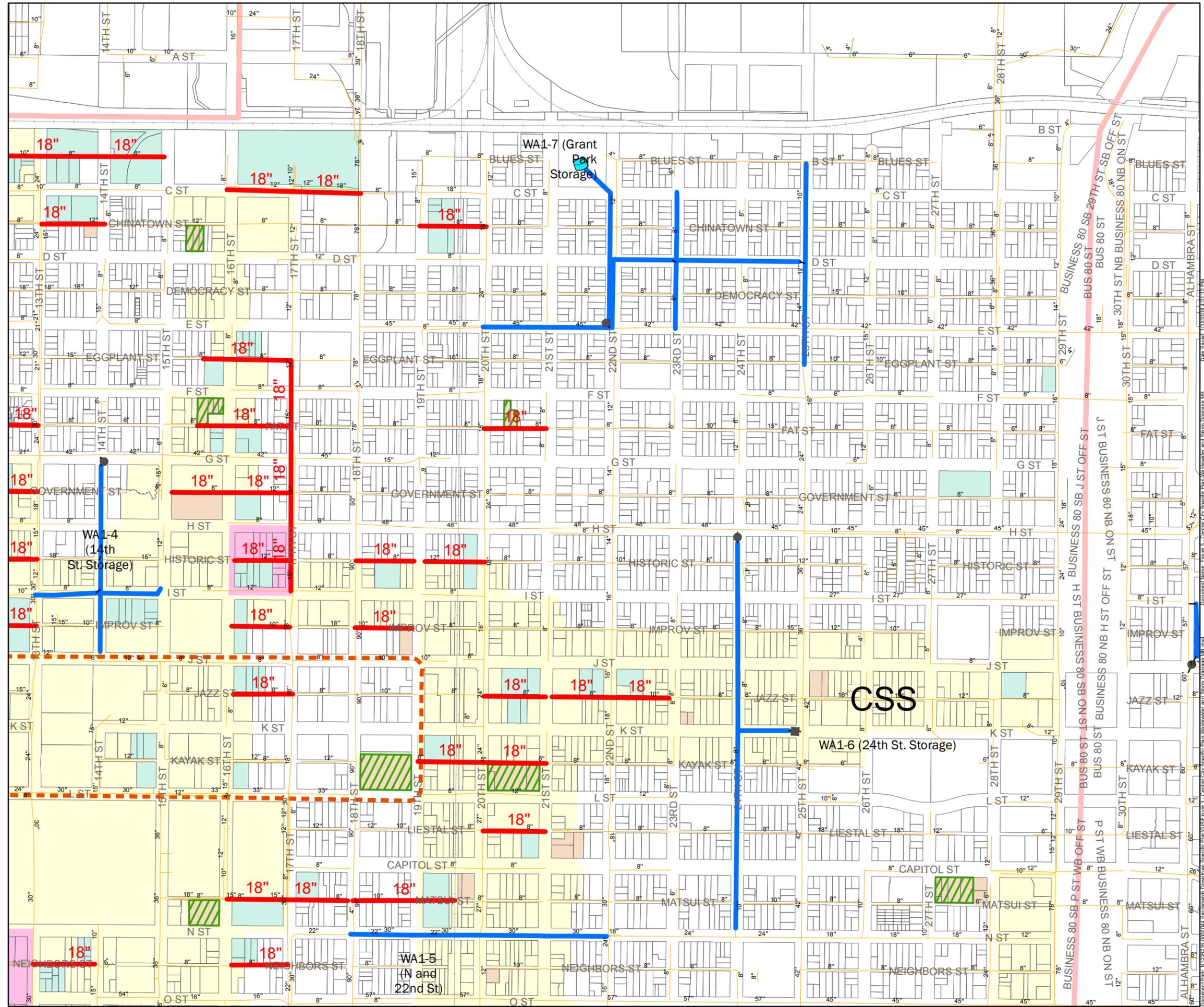
Legend

-  Storage
-  Flap Valve/Gate
-  Pumps
-  Weirs
- Proposed Improvements**
-  CIP
-  CSSIP Sewer Pipes
-  3rd Street CSS
-  CSS Development Specific
-  Basin 52-Alternative 2
- Existing Mains**
-  Drainage
-  Sewer
-  Combined Sewer
-  Completed CSS Upsizing
- Land Use**
-  CCSP Boundary
-  Parcels
-  Opportunity Sites
-  Projects Under Construction
-  Planning Projects
-  Commercial/Office Only
-  Districts
-  Basin 52
-  Streetcar

Key Map



NV5



**Figure 3-C
Wastewater & Storm Drainage**

Legend

- Storage
- Flap Valve/Gate
- Pumps
- Weirs

Proposed Improvements

- CIP
- CSSIP Sewer Pipes
- 3rd Street CSS
- CSS Development Specific
- Basin 52-Alternative 2

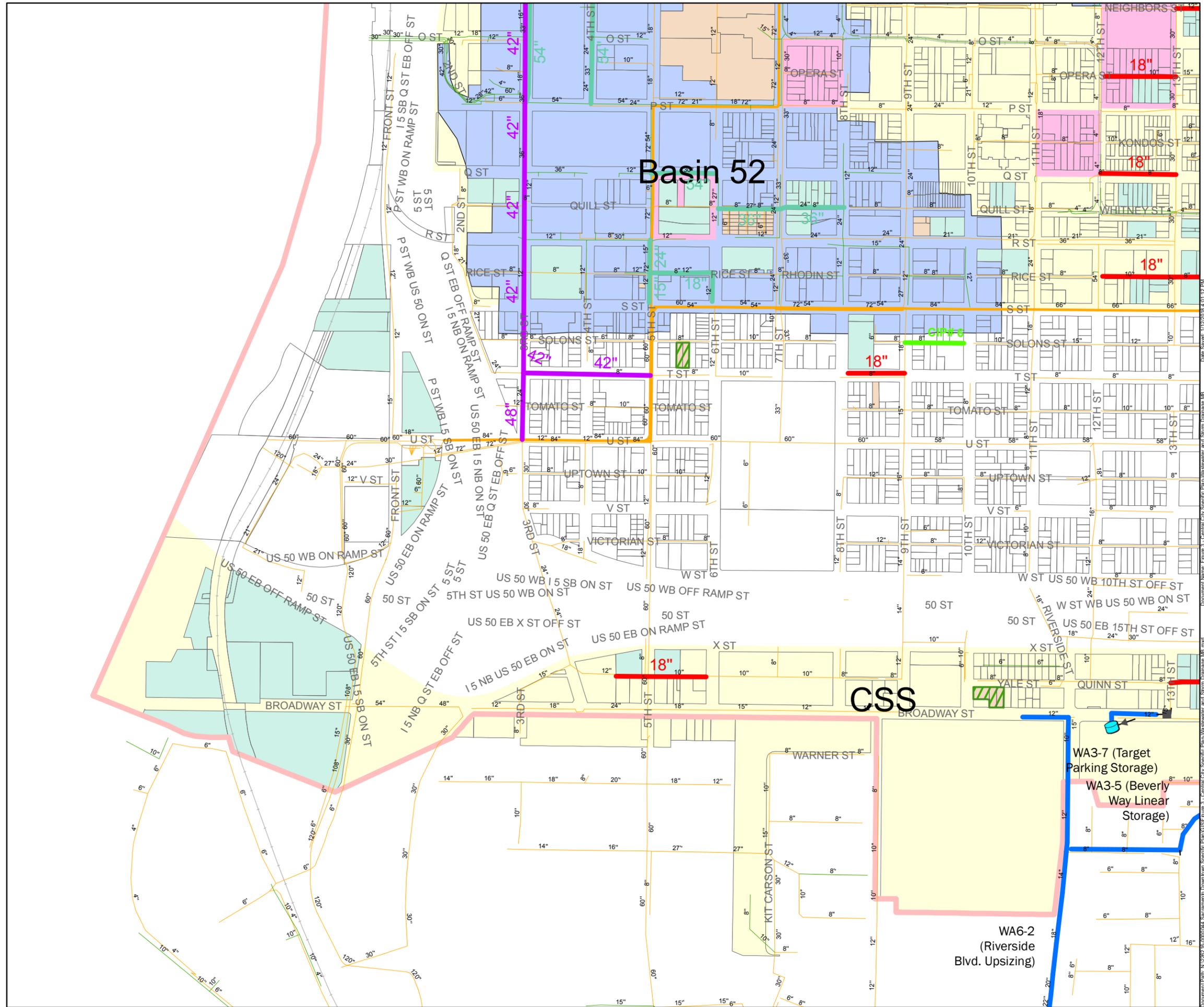
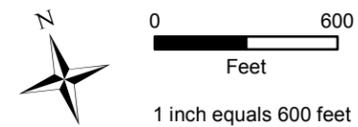
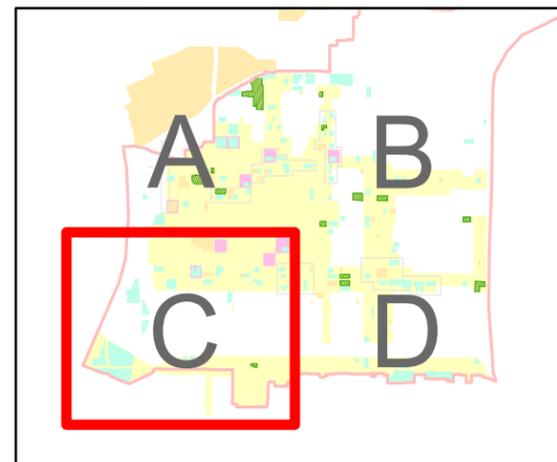
Existing Mains

- Drainage
- Sewer
- Combined Sewer
- Completed CSS Upsizing

Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Basin 52
- Streetcar

Key Map

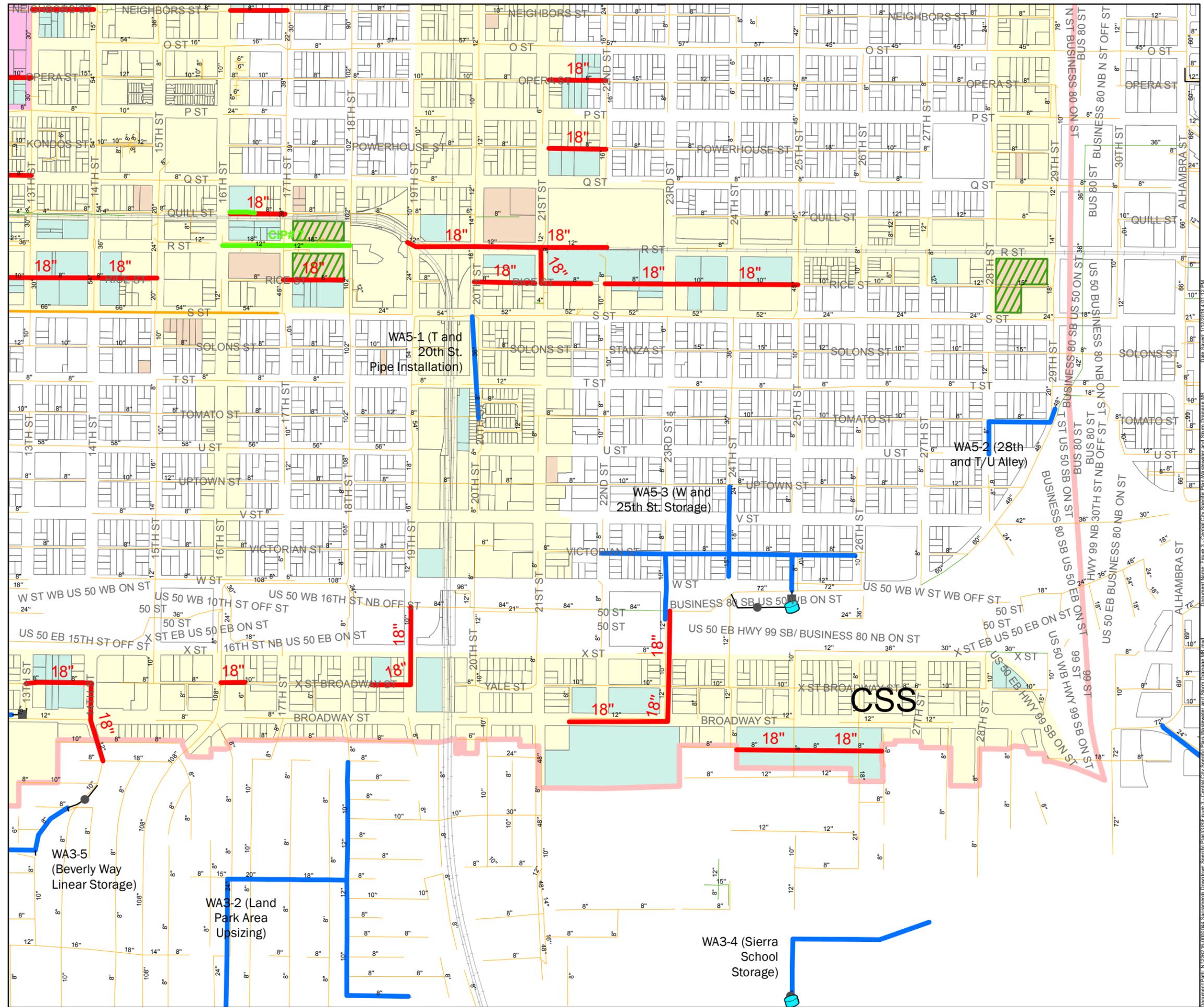
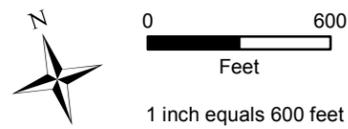
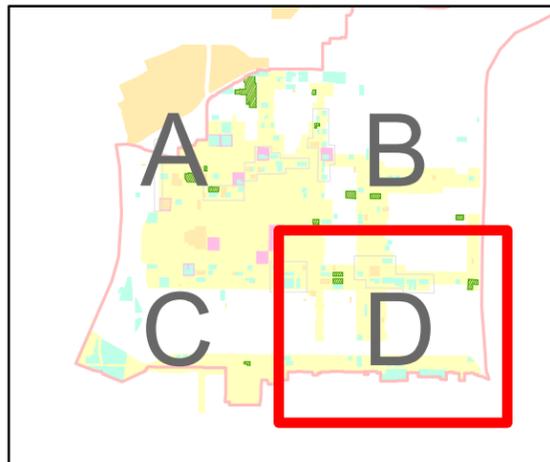


**Figure 3-D
Wastewater & Storm Drainage**

Legend

-  Storage
-  Flap Valve/Gate
-  Pumps
-  Weirs
- Proposed Improvements**
-  CIP
-  CSSIP Sewer Pipes
-  3rd Street CSS
-  CSS Development Specific
-  Basin 52-Alternative 2
- Existing Mains**
-  Drainage
-  Sewer
-  Combined Sewer
-  Completed CSS Upsizing
- Land Use**
-  CCSP Boundary
-  Parcels
-  Opportunity Sites
-  Projects Under Construction
-  Planning Projects
-  Commercial/Office Only
-  Districts
-  Basin 52
-  Streetcar

Key Map





WATER SUPPLY

General Information

The City provides domestic water to the CCSP area. The City utilizes both surface water and groundwater to meet the water demands. The City treats surface water diverted from the Sacramento River and American River through the Sacramento River Water Treatment Plant (SRWTP) and the E.A. Fairbairn Water Treatment Plant (FWTP), respectively. Additionally, the City extracts groundwater from both the North Sacramento and Central Sacramento basins. The current reliable water production capacity is approximately 280 mgd.

Sacramento River Water Treatment Plant: The SRWTP began operation in 1924 with an initial capacity of 32 mgd and treats water diverted from the Sacramento River approximately one-half mile downstream of the confluence of the American River. A new water intake structure, located approximately 700 feet downstream of the old intake structure, was completed in 2003. Other expansions and modifications completed by the City since the 1920s increased the treatment plant design capacity to 160 mgd. The most recent project was completed in 2016, which replaced many of the older facilities at the SRWTP in order maintain the 160 mgd capacity into the foreseeable future.

E.A. Fairbairn Water Treatment Plant: The FWTP is located adjacent the American River approximately seven miles upstream with the Sacramento River. The FWTP began operation in 1964 and has a current diversion limit of 200 mgd following an expansion completed in 2005. Currently, the California Department of Public Health (CDPH) has permitted a capacity of 160 mgd. However, the amount of water diverted is further limited by the so-called Hodge Flow Criteria which restricts diversions from the FWTP under certain low river flow conditions. Hodge conditions have historically occurred about 50% of the time, and can be present in any month of the year. During the time of peak demand, most often in June, July, or August, the Hodge Flow Criteria could limit the diversion rate at the FWTP to 100 mgd. As a result of this constraint, sufficient pipe capacity to move the 160 mgd into the distribution system has not been constructed. The current facility is physically constrained to approximately 130 mgd, which Hodge is not triggered.

Groundwater Wells: The City currently operates 27 municipal groundwater supply wells; 25 wells are located in the northern portion of the City, north of the American River, while the remaining two are located south of the American River. The total pumping capacity of the City's municipal supply wells is approximately 20 mgd, assuming 90% of the production capacity is available. The City has recently completed a well rehabilitation program that improved capacity at a number of existing wells. Overall, the groundwater facilities operated by the City are known to be at or near the end of useful life, and the City is currently preparing a groundwater master plan to help determine the direction and anticipated future capacity of the collective groundwater facilities. The City has also constructed one newer well in the southern portion of the system at Shasta Park, with a second well pending at the FWTP. These two projects are anticipated to supply potable water by 2017-2018. The City anticipates the groundwater pumping capacity to increase to approximately 25 mgd after the activation of the rehabilitated wells and completion of the new groundwater wells.

Distributed Storage: The City maintains eleven enclosed distributed water storage reservoirs together with a total capacity of 45 million gallons (MG). This water is used to meet the water demand for fire flows, emergencies, and peak hours where demands exceed the maximum day supply rates. A new 4 MG distribution storage tank in the southern portion of the City is anticipated to be completed in 2017, which will increase the total storage to 49 MG. In addition to the reservoirs, the SRWTP and FWTP together maintain a combined on-site storage of over 44 MG.

The City operates pumping facilities throughout the area. There are high lift service pumps at the SRWTP and FWTP to move the treated water from the facility reservoirs into the distribution system. The City



also maintains pumping facilities at ten of the City's storage reservoirs. These pump stations are of varying sizes and capacities.

The City differentiates the water mains into two distinct categories: water distribution mains and water transmission mains. Water distribution mains are smaller pipelines located in the streets and alleys utilized for water services. Water transmission mains are larger pipelines utilized to convey water to the distribution mains.

It is City policy to only utilize the water distribution mains for water services, fire services, and fire hydrants. These pipes are typically 4-inches to 12-inches in diameter. If no smaller pipe is available, existing water mains 14-inches and 16-inches in diameter may be considered distribution mains. These pipes may be tapped only with the approval of the City DOU. Considering each service tap is a potential weakening of the water main, the City currently has the policy to restrict the installation of service taps until after a project has been reviewed and approved by the City. This is to restrict the number of taps to the mains to those that are in the ultimate location per an approved development plan. This reduces the number of service taps that are abandoned due to changes in the development plans.

Transmission mains are 14-inches and larger in diameter. They are used to convey large volumes of water from the treatment plants to selected points throughout the distribution system. They are also utilized to transfer water to and from the storage reservoirs to meet fluctuating daily and seasonal demands. These mains cannot be tapped for water services, fire services, or fire hydrants.

The City DOU has an active CIP for maintaining and upgrading the water supply system. The implementation of the water improvements necessary to serve a specific project site is typically the responsibility of future developers. City policy is to require the developer to construct any infrastructure necessary to support the project in question without compromising service or water quality to the project area. To determine if water needs for a project can be met, a water supply test is performed on the existing system. If the existing water system is sufficient to meet the needs, no infrastructure upgrades are necessary. If the existing infrastructure is found to be insufficient for the project's needs, the developer is required to construct necessary infrastructure improvements. Reimbursement agreements are available for construction of facilities included in the development impact fee program.

The current City policy could prove burdensome to a small developer whose project exceeds the capacity of the water system. One project could, under this approach, be held responsible for major infrastructure improvements, creating the possibility of a financial responsibility making the project no longer viable. One possible mitigation for this problem could include the developer entering into agreements with adjacent developers to construct the required facilities as a small assessment district. This process, however, would be complex, expensive, and could be infeasible due to intractable owners.

The infrastructure improvements required for all new development will need to meet current City standards. Looped water main systems are typically required due to the unreliability of dead end mains, and the potential for water quality problems as a result of stagnant water. Additional water main installation may also be required depending on the existing system layout. All new water services are required to be metered.

Temporary source of water for construction is easily acquired two different ways. First, the contractor can purchase a construction service. This potentially could be the ultimate water service tap for the project. Secondly, the contractor can arrange to purchase water from an adjacent fire hydrant.

The City Design Standards for water (Section 13 – Water Distribution System Design Standards) contains the planning and design criteria for water systems. The City DOU is currently in the process of revising these Design Standards. The new standards are anticipated to be adopted by Fall 2017.



Existing Conditions

The CCSP project area is generally served by several major transmission mains ranging in size from 14-inches to 42-inches in diameter together with an extensive system of service mains ranging in size from 6-inches to 12-inches in diameter.

A major transmission main serving the greater Downtown Sacramento area from the SRWTP enters the area at the west end of I Street through a 42-inch diameter pipeline from the Railyards area. This 42-inch pipeline continues easterly through the CCSP area along I Street and H Street, decreasing in size to a 36-inch and then to a 30-inch as it branches north and south to serve the greater CCSP area. The 30-inch leaves the CCSP area at H Street and 29th Street. The 24-inch transmission mains leave the CCSP area at three locations including on Broadway at Muir Street, Broadway on the easterly side of the railroad tracks between 19th and 20th Streets, and Q Street at 29th Street.

There are no wells or reservoirs within the limits of the CCSP area. The nearest reservoir outside of the SRWTP is the Alhambra Reservoir located just to the east of the CCSP area on the block bounded by Alhambra Boulevard, J Street, 33rd Street, and L Street. This reservoir together with the SRWTP are identified by the City as Critical Infrastructure items.

The existing CCSP area is served by an extensive system of service mains ranging in size from 6-inch to 12-inch diameter. Upsizing of the existing mains has been performed over the years as development in the CCSP area has occurred. However, much of the system mains within this region are cast iron pipelines which have demonstrated a history of problems associated with mains reaching the end of their useful life. Hydraulic testing of these mains has determined a severe reduction in capacity. Continued replacement/upsizing of the cast iron mains, and the smaller 6-inch and 8-inch mains is envisioned in order to provide adequate domestic water needs and meet current regulations for fire suppression. Assessment and prioritization of rehabilitation of the distribution system in this area is currently in the beginning stages as part of the City DOU asset management program.

Proposed Improvements

Water Demands: The types of development envisioned with the opportunity sites and the entitled planning projects sites are high-density urban infill type projects. As described in the Land Use section of this CCSP report, the opportunity sites located in the CBD, as defined by the GP, are assumed to have a development density of 165 du/ac. The opportunity sites located in the urban corridors, as defined by the GP, are assumed to have a development density of 100 du/ac. The other opportunity sites are assumed to have a development density of 30 du/ac. For non-residential uses, each opportunity site was assumed to be a mixed-use development with 120 square feet of commercial/retail/office per DU.

Projects within the CCSP area are anticipated to have smaller residential units (700-1000 square feet) with a smaller per capita occupancy rate per unit than traditional single-family or multi-family units in suburban areas. The domestic water demands for these smaller residential units is anticipated to be substantially reduced compared to the City's typical single-family or multi-family water usage criteria. Fire flow demands for these three areas are assumed to be 3,500 gpm for the CBD, 2,500 gpm for the urban corridors, and 1,500 gpm for the remaining areas. Ultimately, the minimum fire flow for a specific building is designated by the fire department during plan review.

The adoption by the State of California of SB7–“20 x 2020” Water Conservation Standards requiring a 20% reduction in urban water usage by the year 2020 and the CalGreen Building Code will require reductions in overall water usage through stricter indoor and outdoor usage. These requirements mandating water conservation will further justify the use of the reduced water rates for the future development in the CCSP area.

The City Water Study Design Manual contains the Water System Design Criteria (WSD Criteria) which is a summary of the recommended potable water system performance and operational criteria. The WSD



Criteria provides a table of gross unit water use factors for various land uses. The demands are broken into two categories of water use factors, residential and non-residential. The residential factors are based on the acre-feet per year per DU (afy/du) and the non-residential is based on acre-feet per year per employee (afy/employee). For the CCSP, all of the anticipated dwelling units are anticipated to be the Residential High category which has a residential factor of 0.12 afy/du. The Commercial/Office land use has a factor of 0.09 afy/employee. These factors have not yet been formally adopted as the City standard and are therefore subject to change.

Given the anticipated development of 13,400 du in the CCSP area, the anticipated increase in the residential average water demand is 1,608 afy (13,400 DUs x 0.12 afy/du). The anticipated development of 3.8 million square feet of new commercial/office/retail space is anticipated to have approximately 11,200 employees which will increase the average water demand by 1,008 afy (11,200 employees x 0.09 afy/employee). The total anticipated increase in the CCSP area average water demand is estimated to be 2,616 acre-feet per year.

Infrastructure: The plan for the CCSP area is to upgrade the existing water system supply grid to provide the opportunity sites, entitled planning project sites, and commercial/office only sites with adequate water for both domestic and fire suppression needs. The existing water system will require strategic upgrades to serve the proposed projects.

The existing transmission mains are not anticipated to be a requirement for development within the limits of the CCSP area. However, the City has identified several sections of older mains that will likely need to be replaced due to age within the next 30 years. These mains will be the responsibility of the City through their ongoing CIP.

Extension of the existing distribution main system is envisioned to provide adequate service to the future development within the CCSP area. The proposed extensions of the existing service main system will be accomplished using a combination of new 8-inch and 12-inch water mains. Density and placement of fire hydrants are usually dependent on the determination from the City Fire Department based on the development in question. When street fronting hydrants are required, new sections of water mains which otherwise may not have been required, may need to be added to the system to meet these requirements. The existing system of 8-inch, 10-inch, and 12-inch service mains will usually be retained provided they adequately serve future development with sufficient hydraulic capacity.

The existing 6-inch and 8-inch mains located within the unobstructed alleys can be retained to provide fire and domestic water service to the adjacent existing buildings. The alleyway mains will be retained as installation and maintenance of new services are more easily performed from the alleys. If alley improvements/activation projects occur, it is recommended older pipelines be replaced concurrent with other surface improvements.

The City DOU is also anticipating the need to add water transmission mains through the CCSP area. These large diameter transmission mains are expected to range in size between 48-inch to 78-inch diameter. The sizes and locations for these transmission mains at this time are very conceptual and no detailed alignment/routing studies have been performed. These mains are needed to move water through the CCSP area to other parts of the City service area to service the future water needs. They are included in this report for informational purposes only.

The proposed water system improvements together with the CIP projects and future water transmission mains are depicted in Figures 4A-4D: Water Mains.

**Figure 4-A
Water Mains**

Legend

Proposed Improvements

- 8" Water
- 12" Water
- CIP

Future Transmission Main

- 2030
- 2050

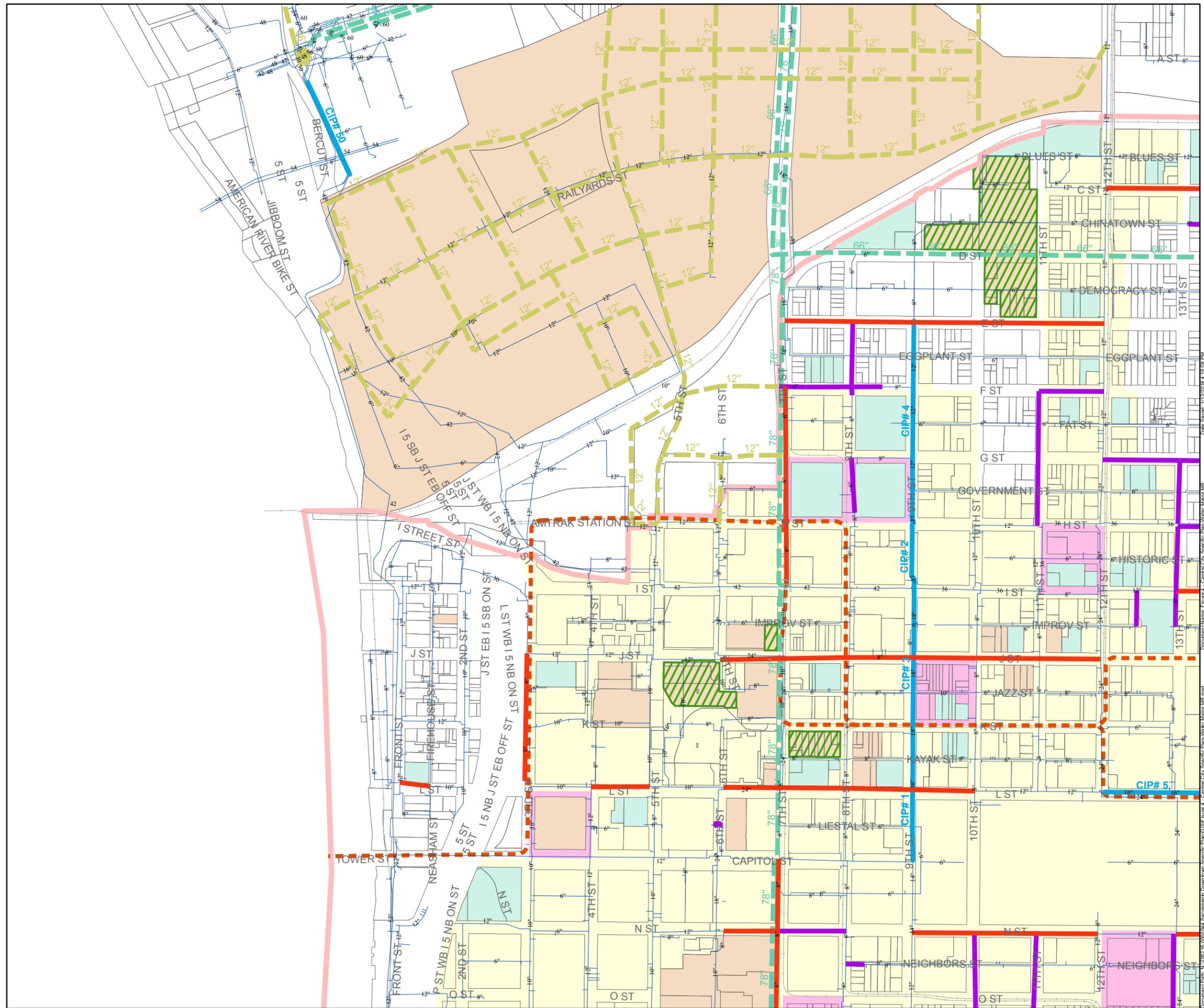
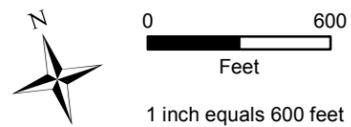
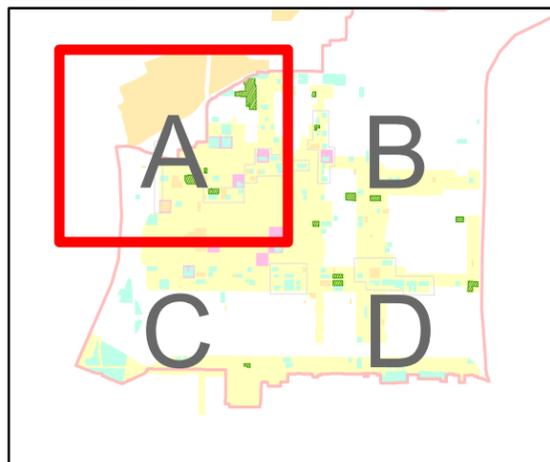
Existing Mains

- Water
- Streetcar

Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Projects Under Construction
- Commercial/Office Only
- Districts

Key Map



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**Figure 4-B
Water Mains**

Legend

Proposed Improvements

- 8" Water
- 12" Water
- CIP

Future Transmission Main

- 2030
- 2050

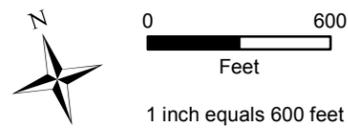
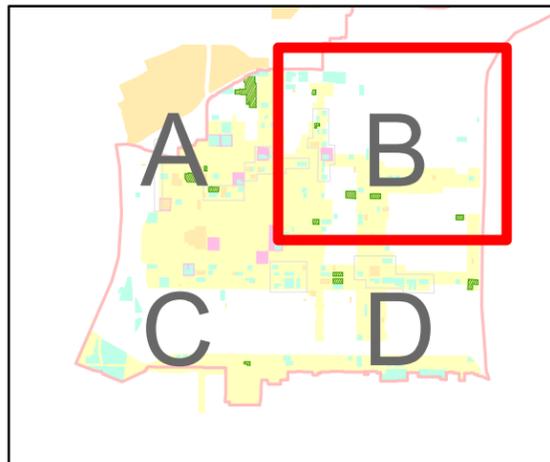
Existing Mains

- Water
- Streetcar

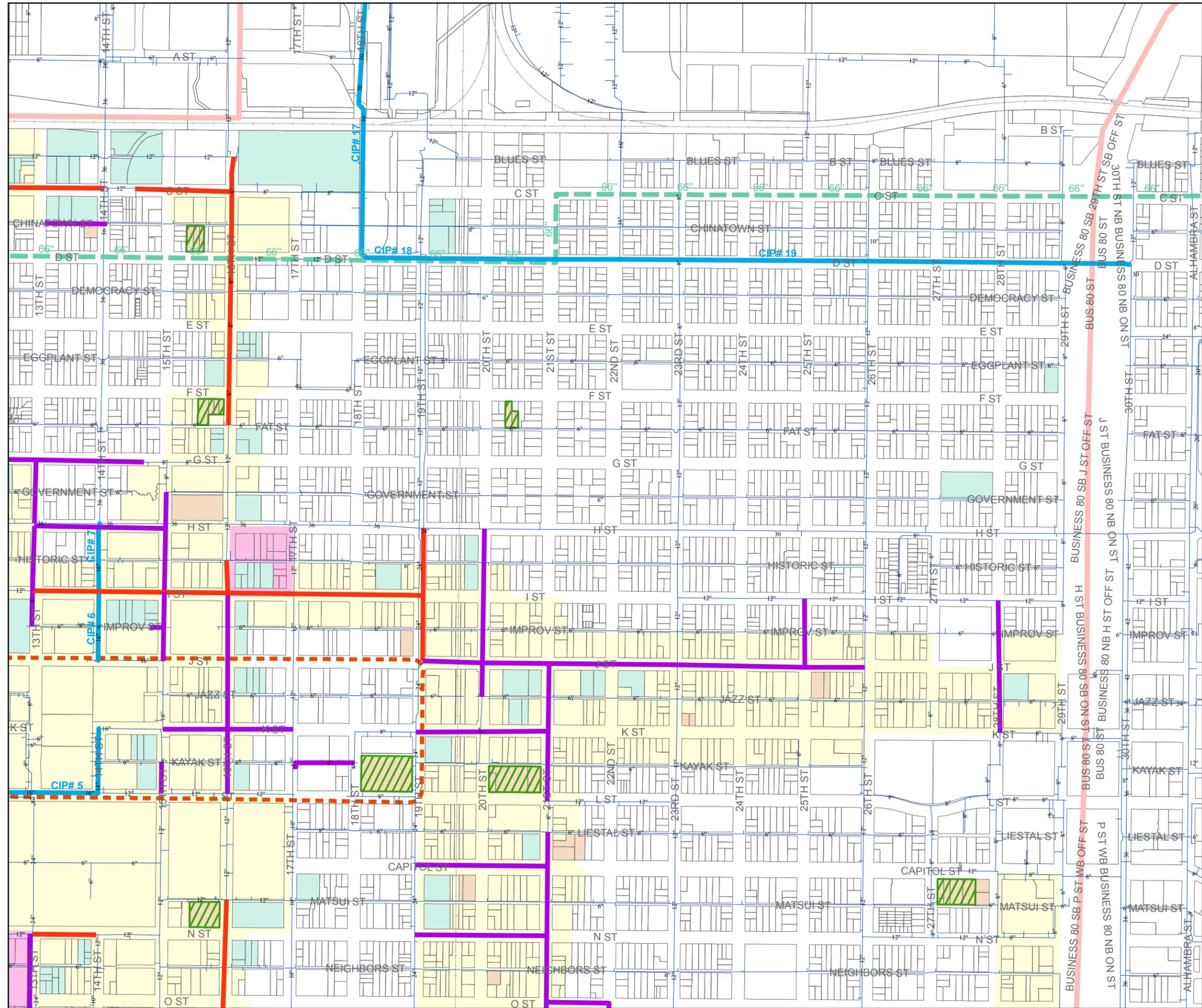
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Projects Under Construction
- Commercial/Office Only
- Districts

Key Map



NV5



**Figure 4-D
Water Mains**

Legend

Proposed Improvements

- 8" Water
- 12" Water
- CIP

Future Transmission Main

- 2030
- 2050

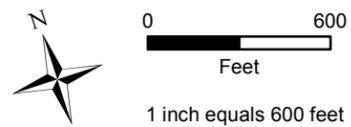
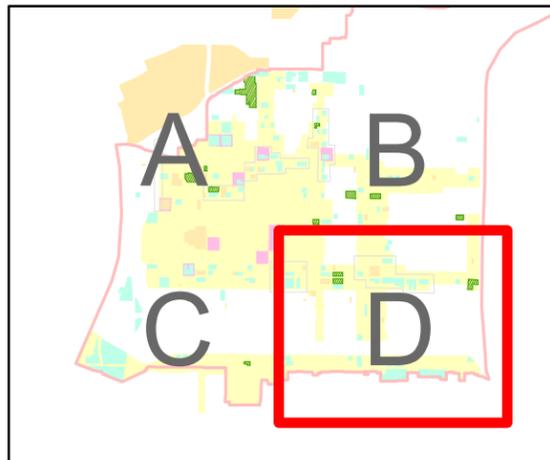
Existing Mains

- Water
- Streetcar

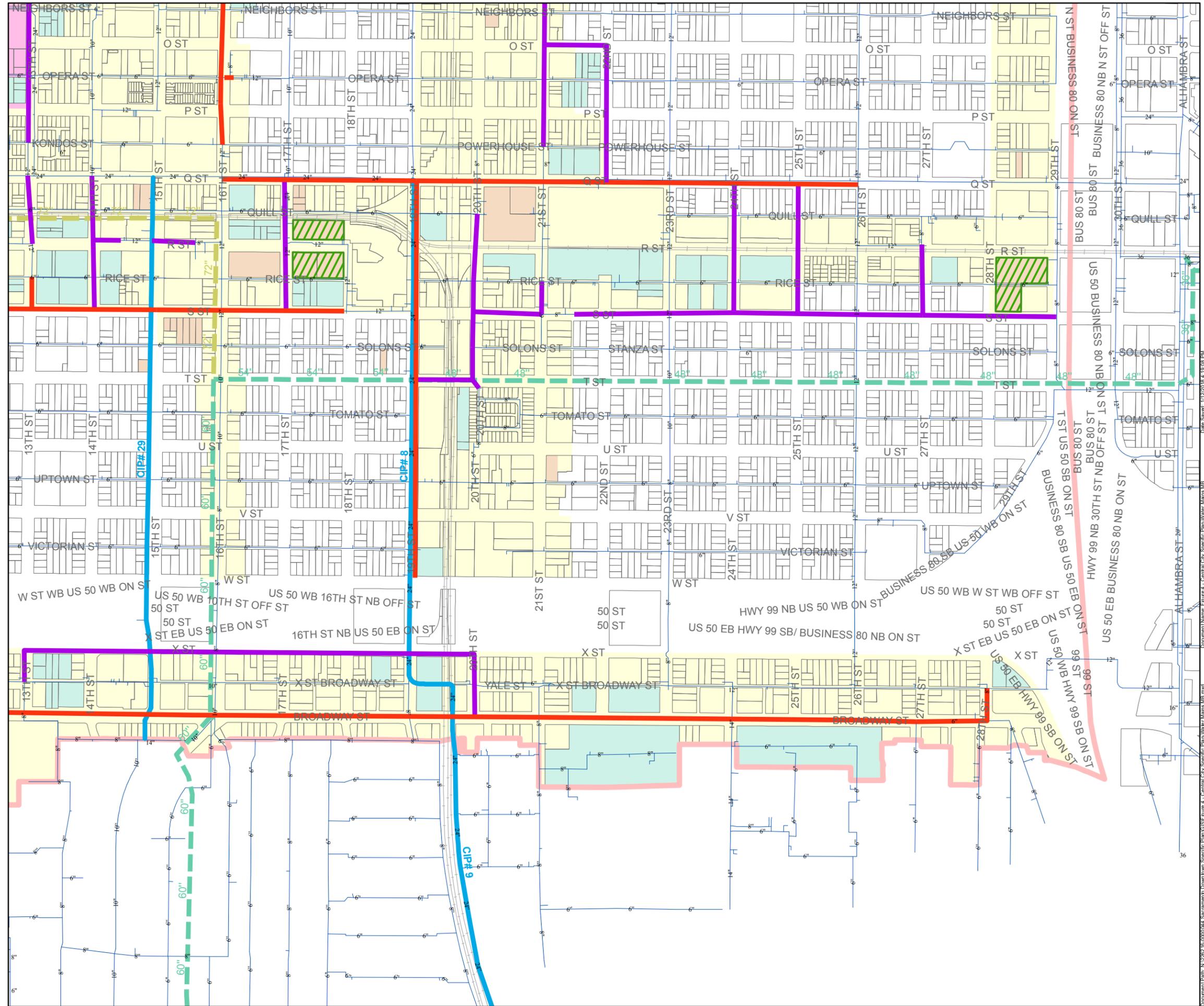
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Projects Under Construction
- Commercial/Office Only
- Districts

Key Map



N V 5





NATURAL GAS

General Information

Pacific Gas & Electric Company (PG&E) supplies natural gas to the Sacramento area. During the winter, approximately 70% is imported from Canada and the balance is supplied from California production wells. During the summer, this ratio is reversed. Also during the summer, gas prices are lower so gas is stored in underground reservoirs for use during winter peak use periods.

In the CCSP area, there are both high pressure and low pressure distribution systems. High pressure system pipelines, generally 4-inch diameter and larger, carry gas at approximately 40 pounds per square inch (psi). Low pressure system pipelines, generally 2-inch diameter, carry gas at a pressure of 7-inch water column (about 0.25 psi). Service is generally provided from the low pressure system unless usage exceeds about 3,000 cubic feet per hour; however, in the CCSP area the system is all high pressure. Regulators are used to reduce high pressure to low pressure.

Existing Conditions

The high pressure gas system generally is served by a grid system throughout the CCSP area. The high pressure system pipelines range in size from 4-inch to 12-inch diameter. The low pressure system is predominantly comprised of 1-inch and 2-inch diameter pipelines, in some cases parallel to the high pressure mains.

Proposed Improvements

PG&E was unable to provide a draft of necessary system improvements and/or review of their gas system without specific information regarding gas loads at each potential development site together with an application for service.

PG&E has indicated they are currently making improvements to their system in accordance with a number of projects and initiatives which may negate the need for future improvements when or if the new developments are constructed. PG&E will service the new developments and infrastructure as they are constructed and require service. Upgrades to the existing system will be addressed on a case-by-case basis as additional information is received on the actual development square footage and maximum and minimum gas loads.

If the user is a core (non-interruptible) customer in the service area and will accept service at 7-inch water column pressure, the company is generally obligated by California Public Utilities Commission (CPUC) regulations to provide service without additional cost for service. If the user is a non-core (interruptible) customer, or needs an elevated pressure service for large volume use, there are charges for service according to PG&E new business tariffs. Whether a project is a core (non-interruptible) user or a non-core (interruptible) user is dependent on the type of use for the facility or business. Projects in the CCSP are most likely to be core (non-interruptible) customers.



ELECTRICAL

General Information

SMUD provides electrical service to customers located within the CCSP area. Power is transmitted to the CCSP area by a looped underground 115 kilovolt (kV) transmission system that feeds several substations that step down the voltage to 12 kV and 21 kV distribution systems. The 115 kV loop connects SMUD Station A located at 6th and H Streets, Station B located at 19th and O Streets, and Station D located at 8th and R Streets. This loop is also connected to the North City (north of 20th & C Streets) and Mid City (35th & R Streets) substations.

Station D, Mid City, and the North City substations step down the 115 kV to 21 kV and Station A and Station B step down 115 kV to 12 kV to serve the overall Central City area. The 12 kV system serves a secondary network system. The 21 kV system serves the balance of the Central City area and will likely be used to serve new development within the CCSP area.

Existing Conditions (Facilities)

As stated above, the 115 kV transmission system is connected to Station A located on the north side of H Street between 6th and 7th Streets within the CCSP area. The transmission lines are located in H Street from the Substation to 5th Street and then in 5th Street south through the CCSP area.

The southerly portion of the CCSP area is served by the 21 kV distribution system. This system is fed by Station D and by Mid City. Station D has two 40 Mega Volt Amperes (MVA) transformer banks. Mid City has two 37.5 MVA and two 25 MVA banks.

The 12 kV network has limited capacity for expansion. It is served by Station A which has six banks (ranging from 20-25 MVA) and Station B which contains three 37.5 MVA transformer banks and have no further room for additional transformer banks. The 115 kV circuits utilize pressurized oil-filled cables with pumps that circulate oil through the cables. Repairs or relocations are difficult, expensive, and require importing technicians from out of state where this older technology is more common. Connections are expensive for customers, requiring large underground vaults and redundant transformers and feeds, with fire suppression and dewatering facilities.

Regulatory Context

The energy consumption of new buildings in California is regulated by State Building Energy Efficiency Standards, Title 24. These are contained in the California Code of Regulations, Title 24, Part 2, Chapter 2-53. Enforcement of the regulations is addressed in the California Code of Regulations, Title 20, Chapter 2, Subchapter 4, Article 1. Title 24 applies to all new construction of both residential and non-residential buildings and regulates energy consumed for heating, cooling, ventilation, water heating, and lighting.

Proposed Improvements

Based on land use projections assumed under the CCSP, SMUD estimates that the additional electrical load from development within the CCSP area may be 70 to 90 megawatts. A majority of the load would require adding major components in the CCSP area. SMUD is already working on replacing the North City substation with Station E, a 60 MVA facility. This allows for additional express feeders mainly to serve the Railyard Specific Plan development but also to offload and back up Central City feeders to serve development (initiated by the new Golden 1 Center arena) within the CCSP area. An existing North City feeder is being extended to the CCSP area in 2017 and the first express feeder is planned by 2019 when Station E is completed.



Once Station A (network) is replaced with Station G, and the Station A site is decommissioned, Station A is being planned to add 80 MVA. With the addition of 13,400 du and 3.8 million square feet of commercial development, another three 40 MVA substation would be required along the 7th Street corridor in the Railyards or River District, preferably between North B Street and Richards Boulevard. However, this could be located anywhere between 7th Street and 10th Street, North B Street and Richards Boulevard. The substation is more expensive to construct west of 7th Street and less expensive further east since overhead facilities will need to be extended from Station E.

There will be cases where multiple adjacent opportunity sites are on a common 21 kV feeder, necessitating switch(es), risers, line reconductor, or line extension to the parcel(s). Additional major equipment and infrastructure external to the CCSP area will be required as electrical demand approaches area electrical capacity. This would require additional duct banks and splice vaults along 5th and 6th Streets. There is also a possibility of extending a feeder tie on 7th or 12th Streets from the north, but this may be external to the CCSP Area. These improvements will be identified in SMUD's five-year system plan as the need arises. Depending on phasing of the opportunity sites, some smaller sites may be fed off the Network system. Extension of the existing 21 kV distribution system will be required to serve the opportunity sites and entitled proposed project sites.

In the near term, SMUD anticipates extending the existing 21kV system from the intersection of 7th and L Streets, north on 7th to the K/L Alleyway, then east in the K/L Alleyway to 10th Street. This extension of the system is proposed for construction in 2017-2019. It is anticipated that an extension of the 21 kV line will be required along 3rd Street from I Street to N Street and connecting with a location west of 2nd Street (just west of the Crocker Museum). The section on 3rd Street from J to I Street (Alternative 1) or on J Street across from 3rd to 5th Street (Alternative 2) will be required to loop the system. The future extensions of the 21 kV are anticipated mainly along J Street from 3rd to 15th, 15th Street from J to the K/L Alley. The proposed system extensions are depicted in Figures 5A-5D: Electrical. In addition, SMUD is replacing the existing Station A site to a parcel directly north and across Government Alley (will become Station G) from the current site to meet current safety regulations and continue to provide reliable electrical service to the CCSP area. SMUD is reserving the current Station A site for future 21 kV system improvements and a substation.

Another extension will be required on 7th Street from R Street to the Solons or S/T alley, then heading west to 6th Street and a section along Rice or R/S alley from 21st Street to 23rd Street. SMUD will reconductor the overhead line on 6th Street from S to T Street. Reconductoring will also be required along 8th Street from a location near the F/G alley to the D/E alley (Democracy Alley), then west to 7th Street. An extension of an overhead line will be required from Democracy Alley to just north of D Street as well.

The future 21 kV routes and switchgear locations are continually subject to change based on the sequence that sites develop; specific load requirements; other utility conflicts; and availability of required space for splicing manholes, duct banks, etc. These routes would provide the 21 kV feeder system to within two blocks of the identified opportunity sites and entitled proposed project sites. Additional infrastructure (switchgear, transformers, conduit, pull boxes, etc.) to serve these sites will need to be determined with SMUD and the individual site developers.

In accordance with SMUD's Rules and Regulations, offsite infrastructure for the 21 kV extension will be provided by SMUD. All onsite (on or adjacent to the development parcel) infrastructure is required to be provided by site owners/developers. This is applicable when receiving service from SMUD's preferred source.

Site specific improvements are not included in this analysis. Project developers will be required to install service to the proposed project. The proposed development site plan will need to incorporate adequate space (including working clearances) for the placement of aboveground, pad mounted switches and transformers. If space is not available on the project site or immediately adjacent to a project site, an alcove on the ground floor exterior section of the building can house pad mounted equipment; otherwise,



more expensive underground vaults within the street section or building setback will be required. These vaults are very large (typically 9 ft x 20 ft), and costly to install. The costs of the transformer(s), switch(es), and installation are paid by the project developer. To eliminate the challenge and expense of installing the underground vaults, developers are encouraged to plan adequate space for pad mounted switch(es) and transformer(s) when developing the project site plan. For approximate equipment space requirements, refer to: SMUD.org/Business/Support & Services/Design Construction Services/Downtown Commercial/Electric Service in Downtown Sacramento (pdf).

**Figure 5-A
Electrical**

Legend

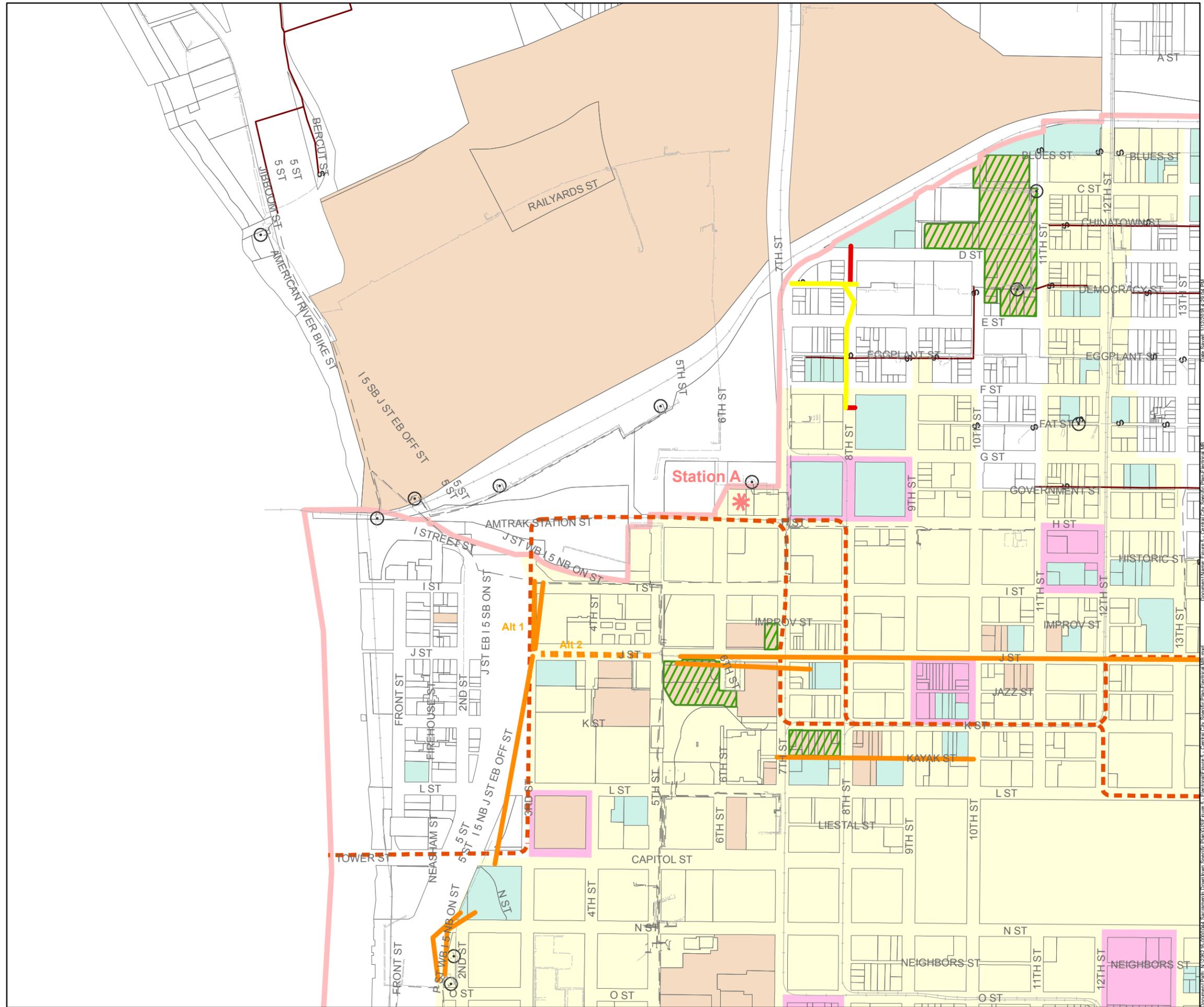
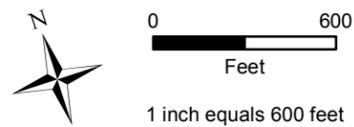
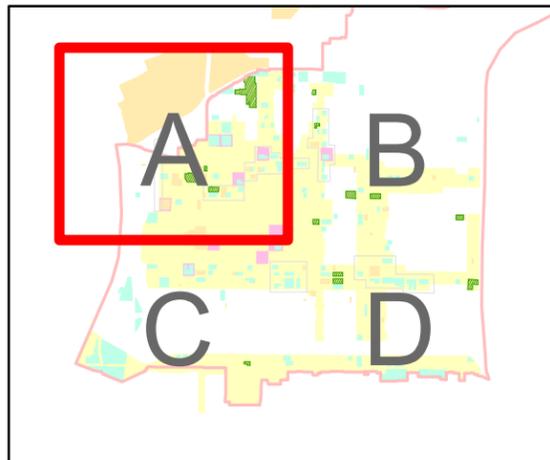
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line
- New Cubicle
- ✱ Station
- 21 Overhead Feeder
- 21 Overhead Local
- 21 Underground Feeder
- 21 Underground Local

Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

Key Map



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**Figure 5-B
Electrical**

Legend

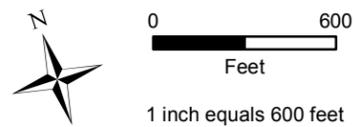
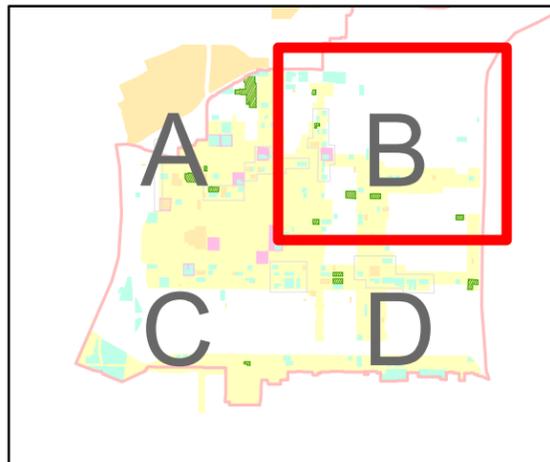
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line
- New Cubicle
- ✱ Station
- 21 Overhead Feeder
- 21 Overhead Local
- 21 Underground Feeder
- 21 Underground Local

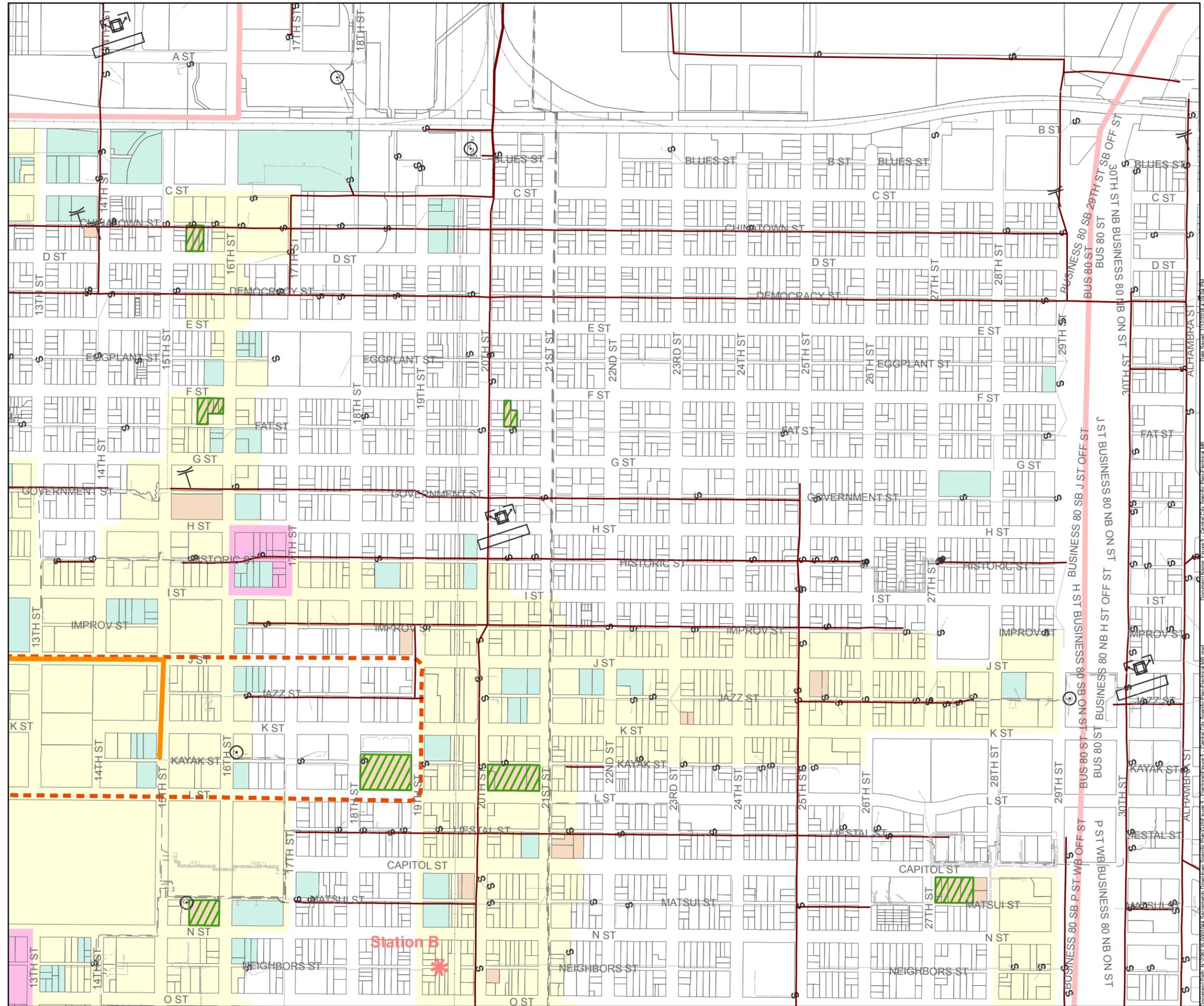
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

Key Map



NV5



**Figure 5-C
Electrical**

Legend

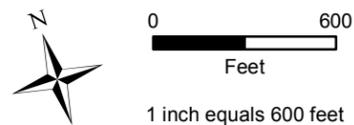
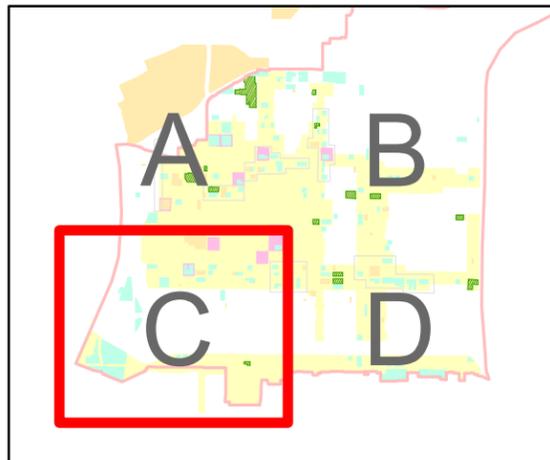
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line
- New Cubicle
- ✱ Station
- 21 Overhead Feeder
- 21 Overhead Local
- 21 Underground Feeder
- 21 Underground Local

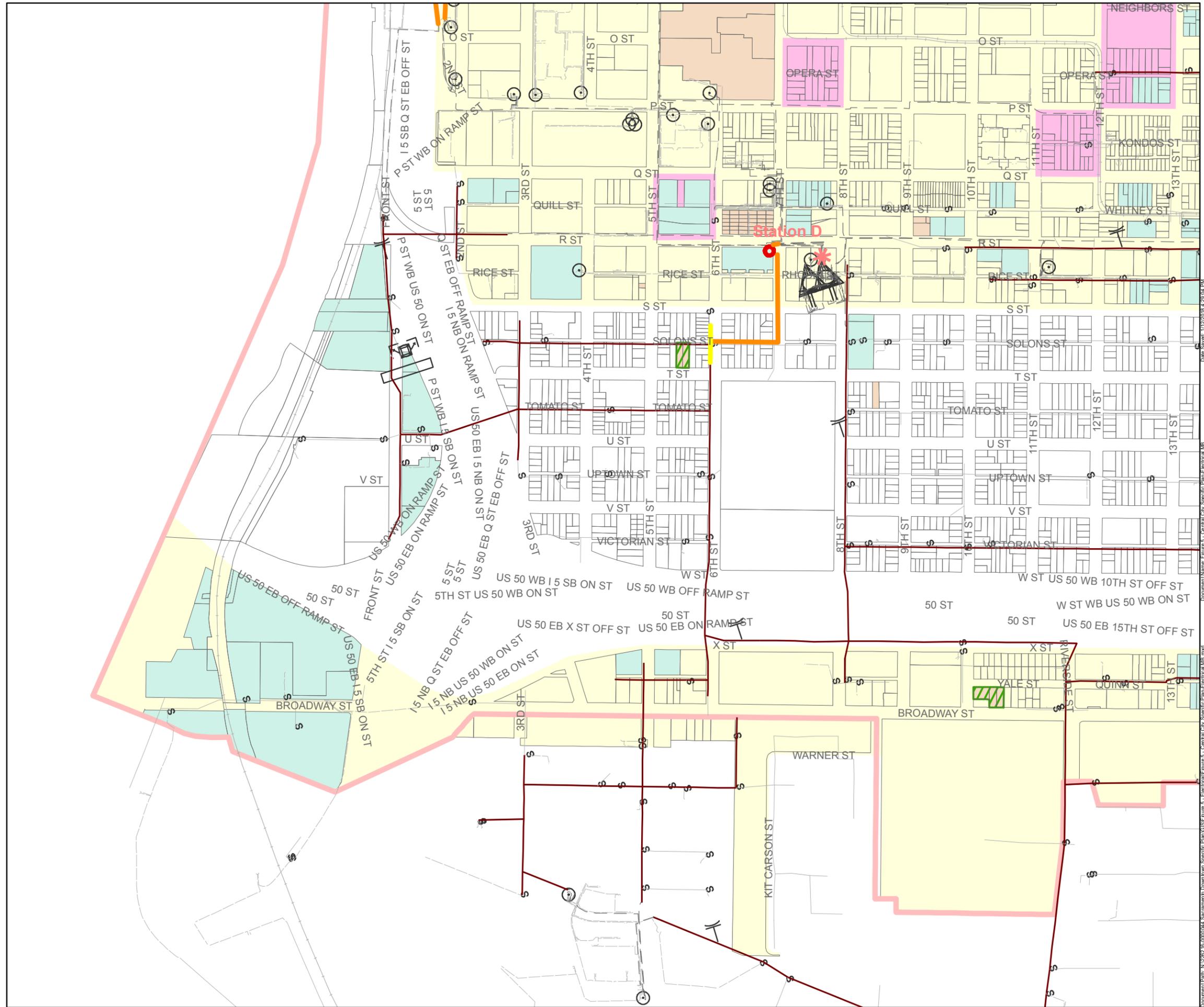
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

Key Map



N V 15



**Figure 5-D
Electrical**

Legend

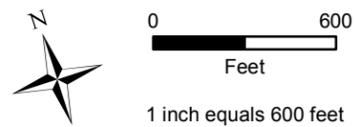
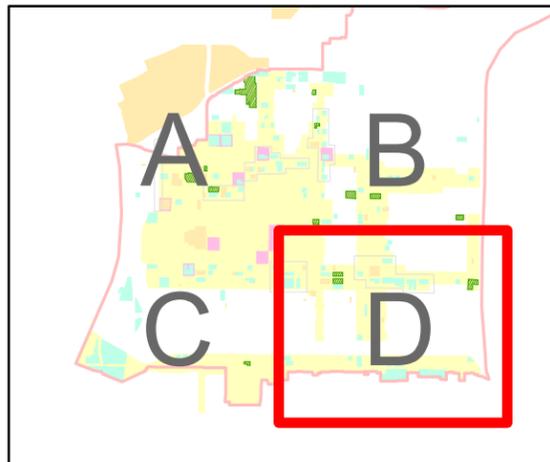
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line
- New Cubicle
- ✱ Station
- 21 Overhead Feeder
- 21 Overhead Local
- 21 Underground Feeder
- 21 Underground Local

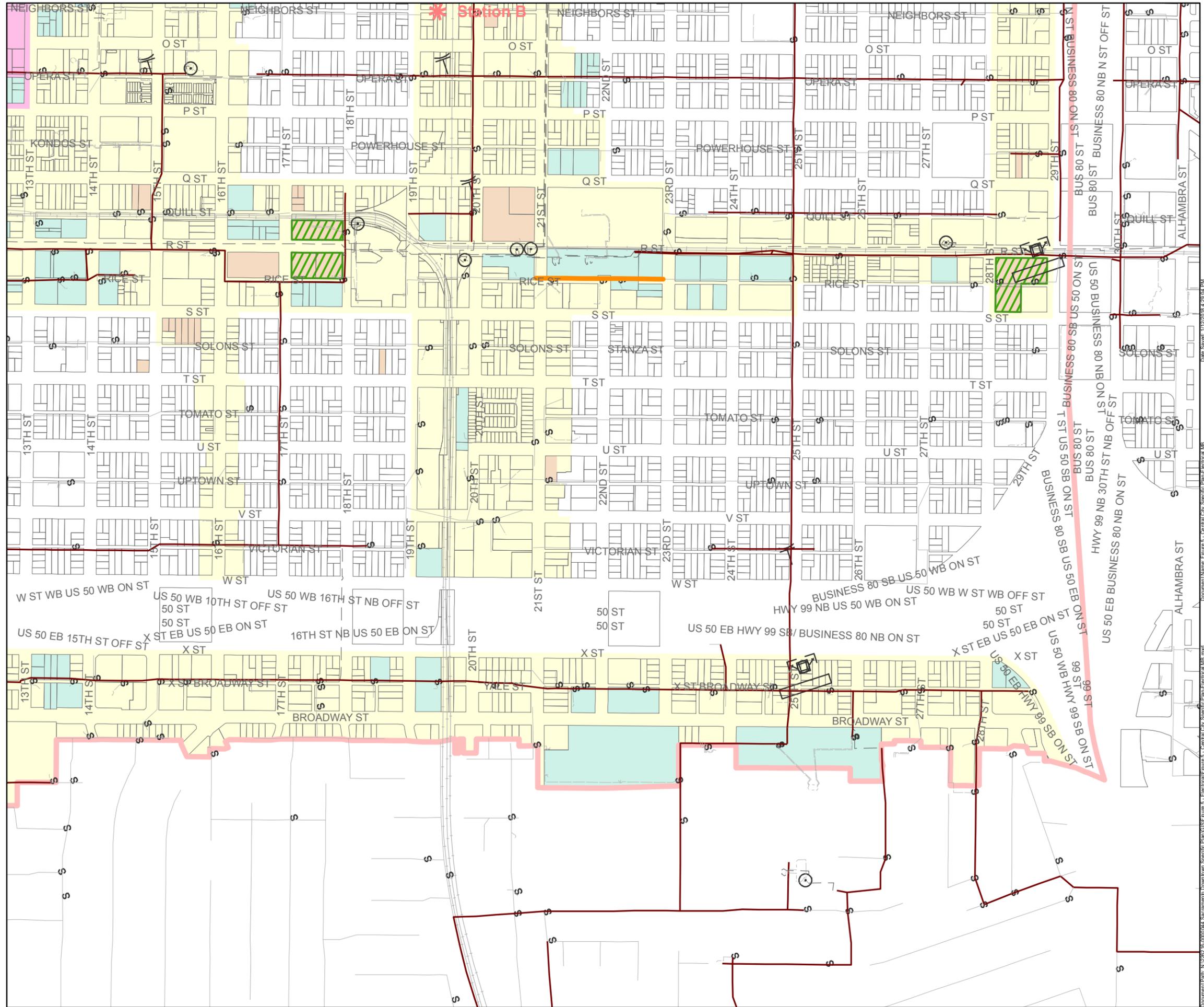
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

Key Map



N V 5





TELECOMMUNICATIONS

General

Within the CCSP area there are numerous telecommunications providers. The following are the main providers for telephone and cable services.

AT&T – Telecommunications

AT&T supplies local and long distance telephone service, and also data communications, in most of the Sacramento area. The CCSP area is served by the Main Wire Center at 14th and J Streets.

AT&T serves the CCSP area with a predominantly underground conduit system. There is a small portion of aerial system at the edge of the CCSP area on 17th Street, northerly of J Street. The main lines are generally located in the streets with the feeder lines located in the alleys.

Recently-developed properties often place the aerial facilities underground, generally in a joint trench with other utilities in an alley or along the street frontage. Cabling in underground conduits can be either copper wire or fiber optic cable.

Comcast/AT&T Broadband

Comcast provides cable television service in the Sacramento area. AT&T Broadband leases conduit space and fiber optic cable capacity from Comcast in the CCSP area.

Comcast serves the Sacramento area with a combination of underground and overhead fiber optic and copper coaxial cable. The signal is generated at a downtown site on N Street near the Capitol and is distributed to hub sites throughout the service area, from which local service is distributed. There are four different service nodes located in and around the CCSP area.

Consolidated Communications

Consolidated Communications also provides telecommunications service in the Central City area. Some of their fiber system is actually in the Comcast/AT&T manhole and conduit system.

The Consolidated Communications system through the CCSP area is centered around the existing larger buildings in the downtown core. Consolidated Communications also operates some aerial facilities.

Electric Lightwave

Electric Lightwave, Inc. (ELI) provides data and communications, internet, and local and long distance voice communications in the Sacramento area for non-residential customers.

ELI serves the Sacramento area with a combination of underground and overhead fiber optic cable and copper cable. The CCSP area is served by a switching site at 650 J Street, and the company has fiber optic connections to most AT&T switching sites. Some customer sites may be connected to ELI facilities using AT&T T-1 connections.

City of Sacramento

The City currently owns an existing fiber network that provides Municipal and Smart City services. The network provides connections between various traffic signals, utility sumps, reservoirs, and City facilities spread throughout the City. The network consists of approximately 160 miles of underground fiber optic cables and conduits that transverse the main corridors of the City. The fiber network currently enables the City to run efficient operations and reduces operational costs, while expanding capabilities. The telecommunications system consists of single or multiple underground conduits, pull boxes, and utility



vaults that are interconnected with the traffic signals, utility services, and various City facilities. The existing City fiber systems are depicted in Figures 6A-6D: City Fiber Cable/Conduit.

The following link shows how the Public Works - Transportation Division utilizes this infrastructure:
<http://www.cityofsacramento.org/Public-Works/Transportation/Traffic-Signals/Traffic-Operations-Center>

Proposed Telecommunications

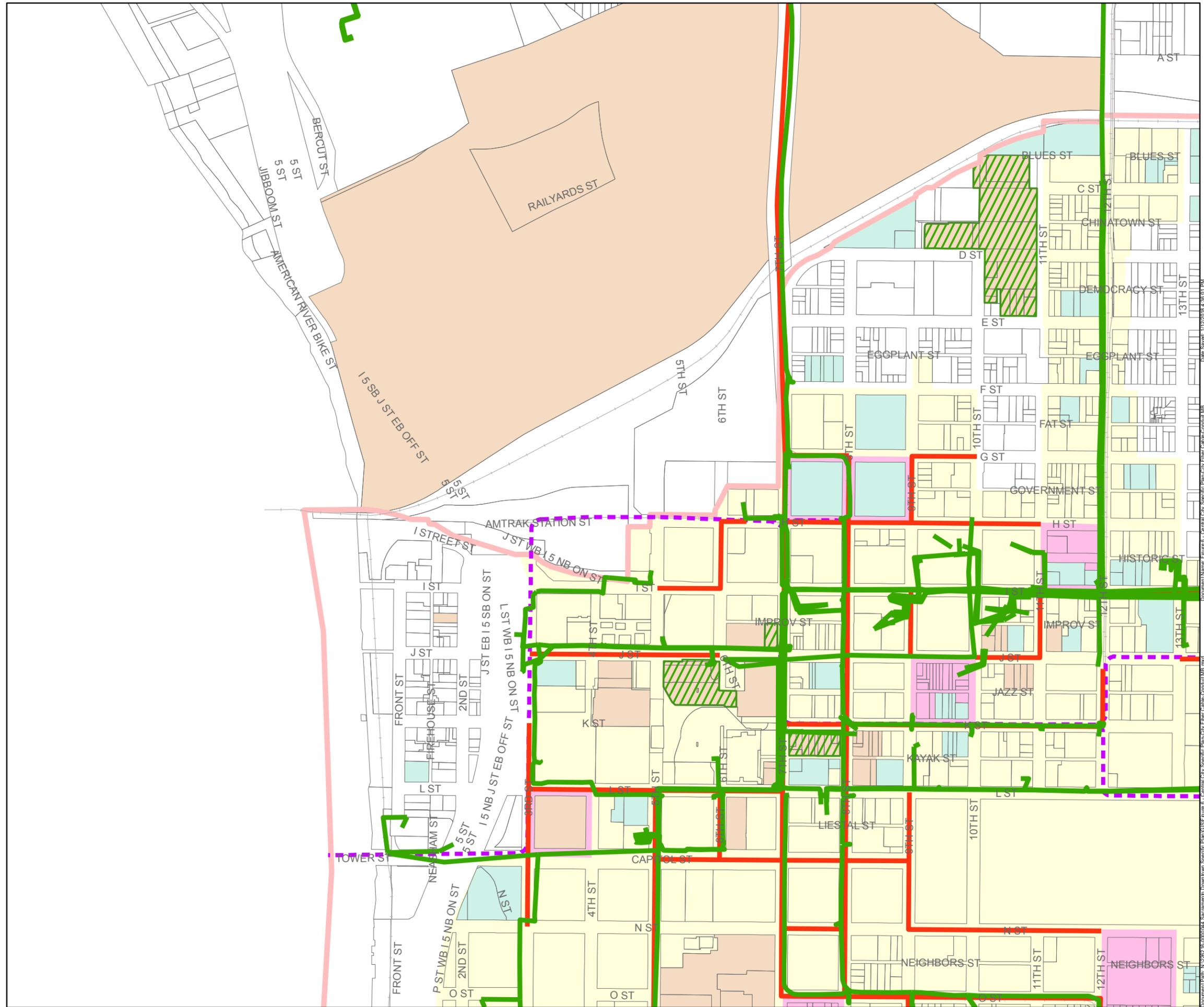
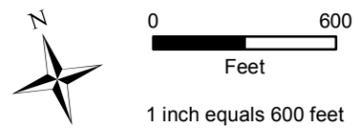
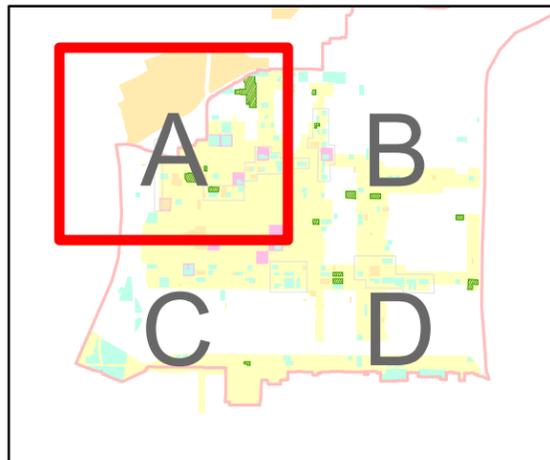
Telecommunications providers have indicated the existing system within the CCSP area should be sufficient to serve the proposed projects and opportunity sites with relatively minor additions. In general, service to each of the new sites will be coordinated with the main electrical service in a common joint trench. Typically, a few 2-inch conduits will be added to the joint trench for service to the projects. Extension of the existing systems can also utilize the proposed 2 1kV conduit trench proposed by SMUD for the electrical system.

**Figure 6-A
City Fiber Cable/Conduit**

Legend

- Existing Fiber Cable/Conduit
- Existing Communication Conduit
- Land Use**
- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

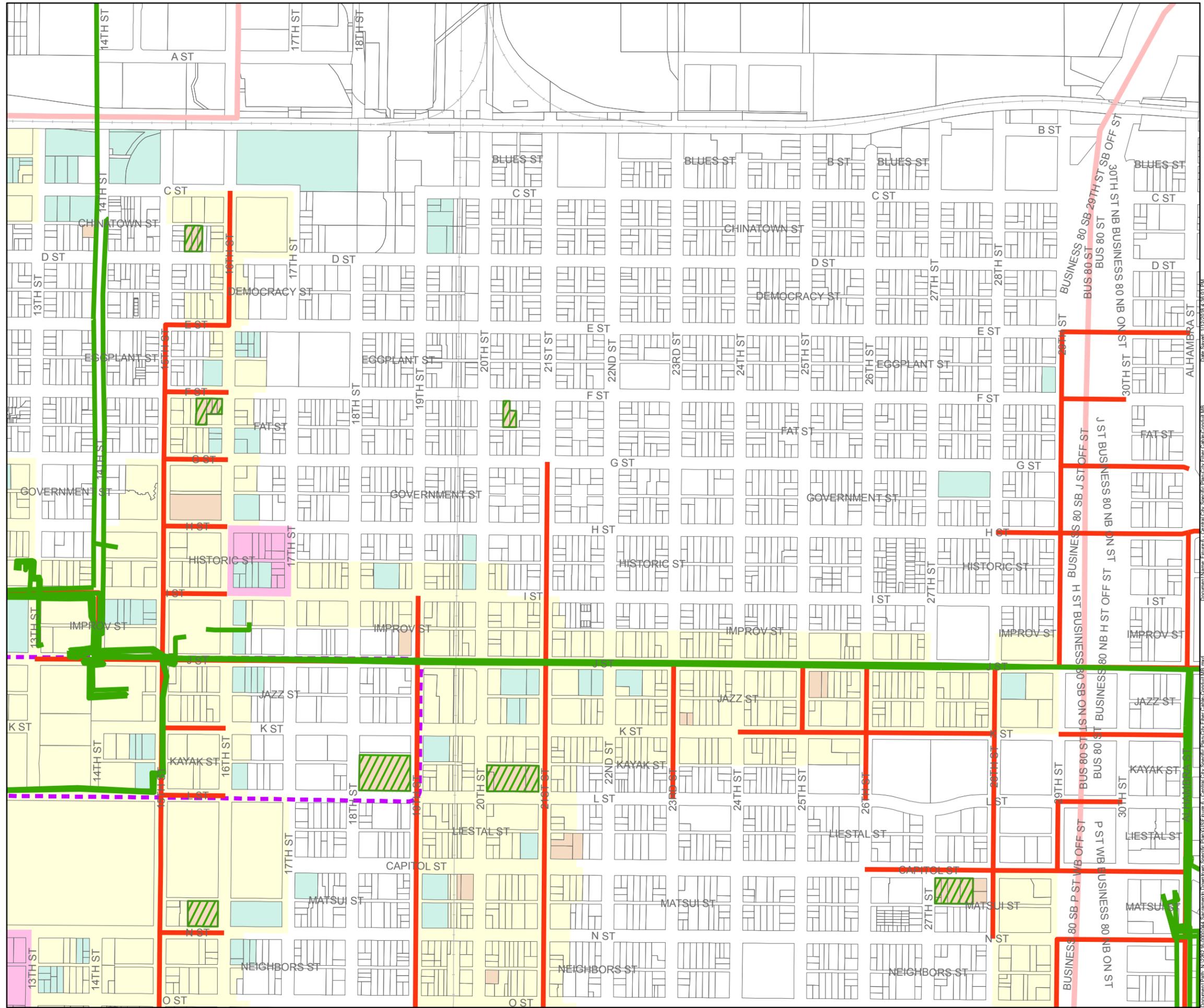
Key Map



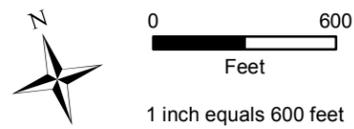
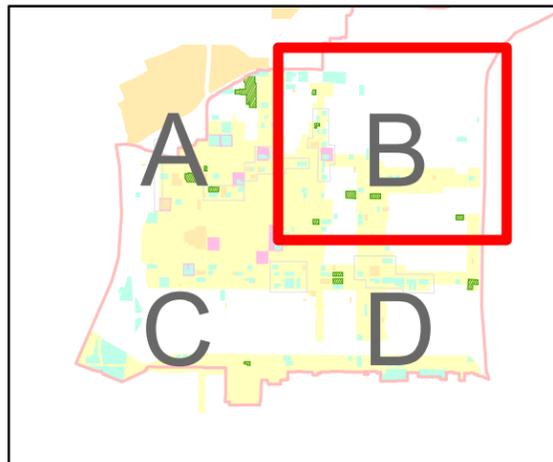
**Figure 6-B
City Fiber Cable/Conduit**

Legend

- Existing Fiber Cable/Conduit
- Existing Communication Conduit
- Land Use**
- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar



Key Map



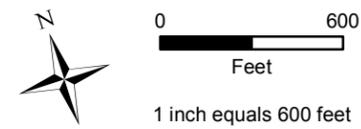
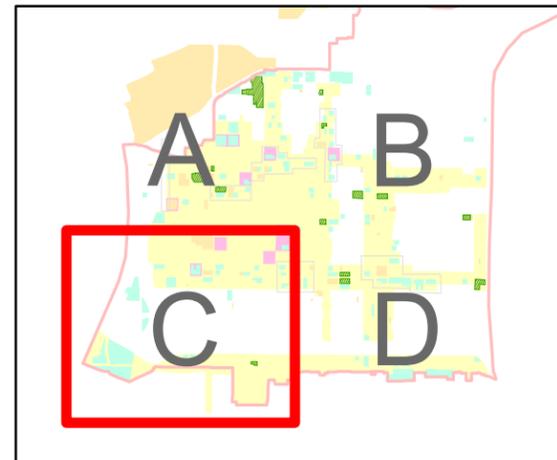
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**Figure 6-C
City Fiber Cable/Conduit**

Legend

- Existing Fiber Cable/Conduit
- Existing Communication Conduit
- CCSP Boundary
- Parcels
- Opportunity Sites
- Projects Under Construction
- Planning Projects
- Commercial/Office Only
- Districts
- Streetcar

Key Map



N V | 5

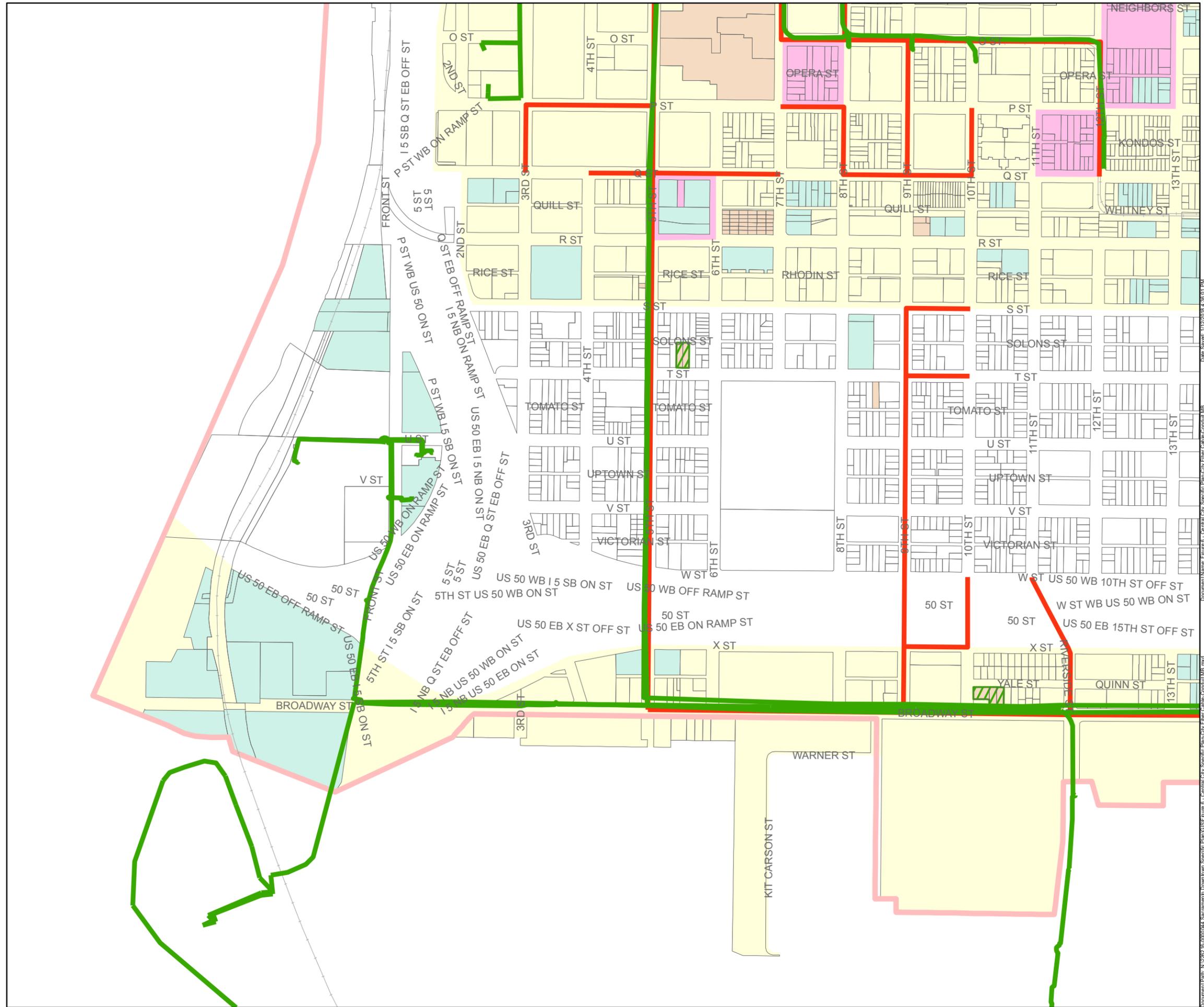
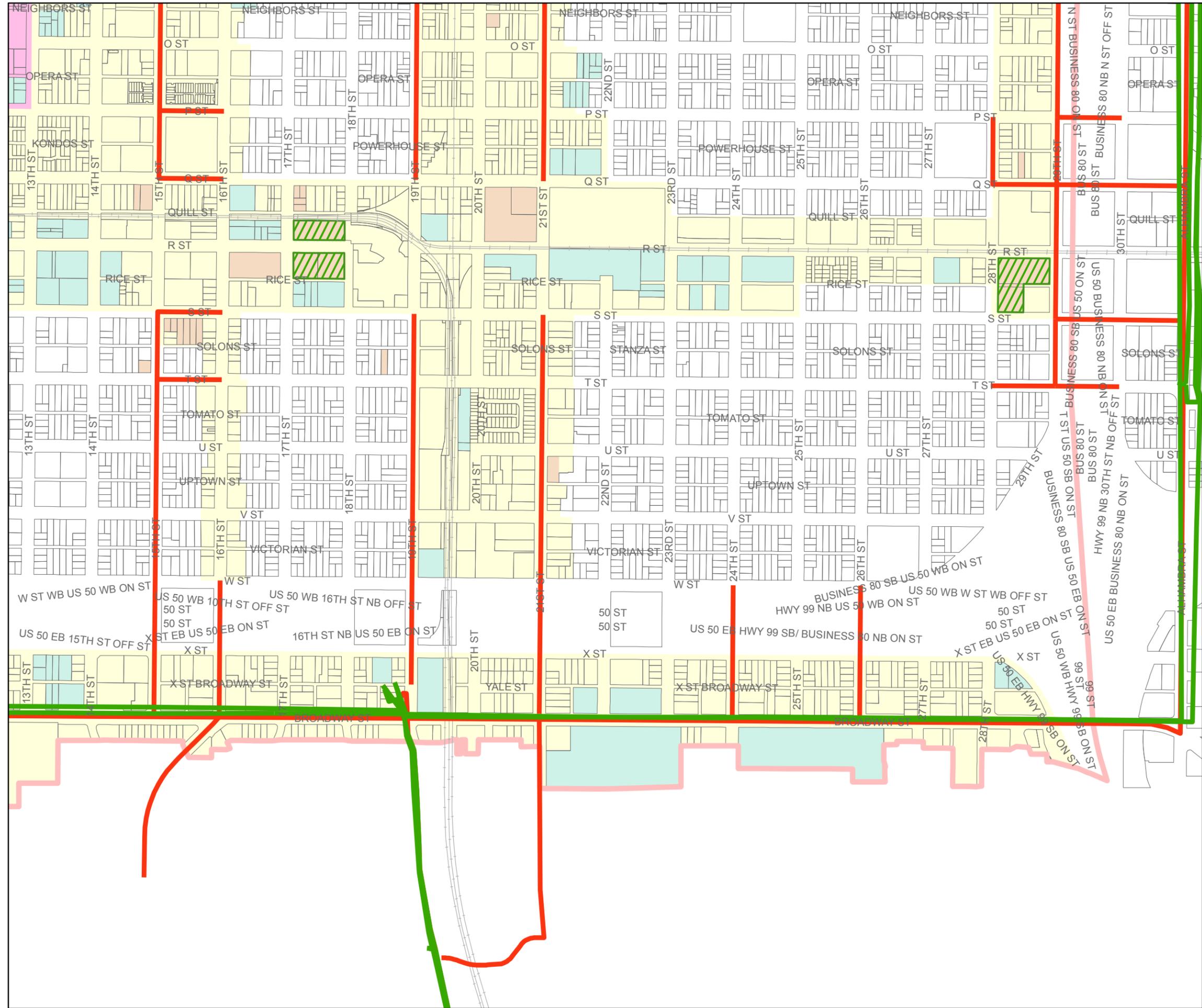
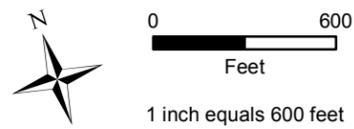
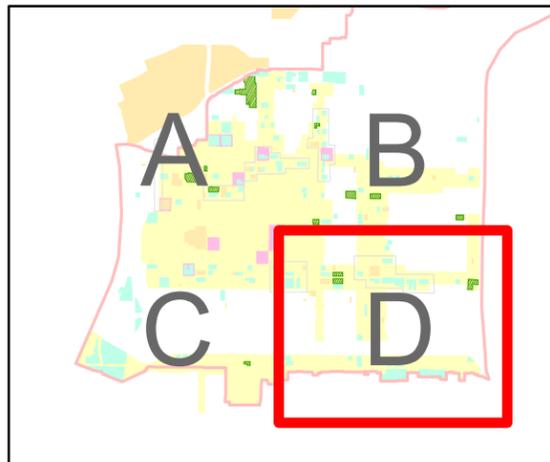


Figure 6-D
City Fiber Cable/Conduit

Legend

- Existing Fiber Cable/Conduit
 - Existing Communication Conduit
- Land Use**
- CCSP Boundary
 - Parcels
 - Opportunity Sites
 - Projects Under Construction
 - Planning Projects
 - Commercial/Office Only
 - Districts
 - Streetcar

Key Map





OPINION OF PROBABLE CONSTRUCTION COSTS

The costs presented here to construct the infrastructure necessary for the CCSP area are intended for planning purposes only. Both the Railyards Specific Plan and River Districts Specific Plan areas have previously prepared financing plans and are excluded from the estimates in this section.

The estimates include the general costs for the overall buildout of the proposed development of the plan area using today's dollars. This estimate is not intended to be utilized for the actual costs for specific projects. The final costs for each specific project will need to be estimated separately and could be considerably different than those shown here due to the uncertainty of the order, timing, and scope of the actual development to be constructed. The estimates have been developed solely to give interested parties a magnitude of the scale of the costs of improvements.

The unit costs are based on actual costs of recent development within the CCSP area, planning level costs utilized by various City departments, as well as engineering judgment. Final unit costs for each specific project will depend on the actual labor and materials costs for the conditions at the time of construction. These conditions might include the scope of the development and the schedule of the completion of the project. It should be noted that costs to construct infrastructure within the CCSP area are significantly higher than costs generally associated with infrastructure construction in the outlying suburban or previously undeveloped areas due to the increased costs associated with working within existing roadways with numerous existing utilities, traffic control, and limited working hours.

The estimates are generally separated into the corresponding infrastructure report chapters for the different utilities. The estimates are limited to the work within the defined CCSP area. Assumptions and clarifications for the costs are noted at the bottom of the individual sheets.

Right-of-way/easement acquisition has not been included in the estimates since it is expected that the improvements will be constructed within the existing road rights-of-way.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

CONSTRUCTION COST ESTIMATE SUMMARY

A. STREET LIGHTS	\$31,110,000
B. WASTEWATER AND STORM DRAIN SYSTEMS	\$177,548,600
C. WATER DISTRIBUTION SYSTEM	<u>\$33,018,000</u>
<u>TOTAL ESTIMATED CONSTRUCTION COSTS</u>	<u>\$241,676,600</u>

Note: All estimated costs are rounded to the nearest \$100.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

STREET LIGHTS

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. Ornamental Street Light - Developer ¹	694	EA	\$15,000	\$10,410,000
2. Northeast CCSP Street Light Area ²	1	LS	\$8,400,000	\$8,400,000
3. Southeast CCSP Street Light Area ³	1	LS	\$9,600,000	\$9,600,000
4. CADA Project (10th-14th, N-R Sts.) ⁴	140	EA	\$15,000	\$2,100,000
5. 16th Street CADA Project	40	EA	\$15,000	\$600,000
TOTAL STREETS LIGHT IMPROVEMENTS				\$31,110,000

Notes:

1. The estimated unit cost for street lights is provided by City Public Works based on the average total project construction cost per light for recent street light construction projects within the Central City area.
2. The Northeast CCSP Street Light Area project estimated costs were provided by Public Works from a previous study and increased by 20% as recommended by Public Works to account for recent increases in street light construction costs.
3. The Southeast CCSP Street Light Area project estimated costs were provided by Public Works from a previous study and increased by 20% as recommended by Public Works to account for recent increases in street light construction costs.
4. The total estimated number of street lights in the CADA Project Area is from a 2013 study of the area performed by Public Works.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

WASTEWATER & STORM DRAINAGE SYSTEM

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	31,740	LF	\$390	\$12,378,600
2. CSSIP WA1-1 (Zapata Park) ²	1	LS	\$11,129,000	\$11,129,000
3. CSSIP WA1-2 (G & 9th St. Parking Lot)	1	LS	\$9,629,000	\$9,629,000
4. CSSIP WA1-3 (9th St. from G to L St.)	1	LS	\$4,376,000	\$4,376,000
5. CSSIP WA1-4 (14th St. Storage)	1	LS	\$4,987,000	\$4,987,000
6. CSSIP WA1-5 (N and 22nd St.)	1	LS	\$2,866,000	\$2,866,000
7. CSSIP WA1-6 (24th St. Storage)	1	LS	\$9,074,000	\$9,074,000
8. CSSIP WA1-7 (Grant Park Storage)	1	LS	\$22,857,000	\$22,857,000
9. CSSIP WA5-1 (T & 20th St. Pipe)	1	LS	\$744,000	\$744,000
10. CSSIP WA5-2 (28th & T/U Alley)	1	LS	\$566,000	\$566,000
11. CSSIP WA5-3 (W & 25th St. Storage)	1	LS	\$13,761,000	\$13,761,000
12. CSSIP WA3-7 (Target Parking Storage)	1	LS	\$9,963,000	\$9,963,000
13. CSSIP WA6-2 (Riverside Bl. Upsizing) ³	1	LS	\$1,901,000	\$1,901,000
14. 3rd Street CSS Relief Sewer ⁴	1	LS	\$10,350,000	\$10,350,000
15. 2012 Wastewater CIP#3 (1608 Q Street) ⁵	1	LS	\$266,000	\$266,000
16. 2012 Wastewater CIP#6 (S/T Alley 9th - 10th)	1	LS	\$261,000	\$261,000
17. 2012 Wastewater CIP#7 (R Street 16th- 17th)	1	LS	\$401,000	\$401,000
18. Basin 52 Master Plan – Alternative #2 ⁶	1	LS	\$62,039,000	\$62,039,000
TOTAL WASTEWATER & STORM DRAINAGE IMPROVEMENTS				\$177,548,600

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assume a 50% allowance for contingencies, engineering, and construction management.
2. The CSSIP project costs are based on the estimates from the CSSIP Update Report dated August 2014. The costs have been adjusted from the August 2013 dollars based on an Engineering News Record (ENR) Construction Cost Index (CCI) of 9967 which is an average of the 20 cities and San Francisco indexes to the December 2016 ENR-CCI of 11,070 average of 20 cities and San Francisco. Adjusted costs are rounded to the nearest \$1,000.



3. The CSSIP WA6-2 (Riverside Bl.) project is only partially located within the CCSP area. The estimated cost was adjusted as a portion of the overall project cost by using the ratio of the length within the CCSP to the overall project length. Adjusted cost is rounded to the nearest \$1,000.
4. The 3rd Street CSS Relief Sewer project costs are based on preliminary design estimates from NV5, the consultant engineer currently working on the project design.
5. The 2012 Wastewater CIP project costs are based on the estimates from the 2012 CIP Programming Guide with the costs adjusted from the April 2012 dollars based on an ENR Construction Cost Index (CCI) 20 cities of 9273 to the December 2016 ENR-CCI of 10,530 20 cities. Adjusted costs are rounded to the nearest \$1,000.
6. The Basin 52 Master Plan are based on preliminary conceptual estimates for the likely preferred Alternative #2 dated 12/12/16. The updated Master Plan is still a draft so the estimates are subject to change.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

WATER SYSTEM

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. Development Water Main, 8" Pipe ¹	43,500	LF	\$150	\$6,525,000
2. Development Water Main, 12" Pipe ¹	43,950	LF	\$180	\$7,991,000
3. 2012 Water CIP#1 (9th St. - K/L to Cap. Mall) ²	1	LS	\$439,000	\$439,000
4. 2012 Water CIP#2 (9th St. - H to I Sts.)	1	LS	\$292,000	\$292,000
5. 2012 Water CIP#3 (9th St. - I to K/L Alley)	1	LS	\$777,000	\$777,000
6. 2012 Water CIP#4 (9th St. - E to H Sts.)	1	LS	\$877,000	\$877,000
7. 2012 Water CIP#5 (12th & L to 14th & K)	1	LS	\$877,000	\$877,000
8. 2012 Water CIP#6 (14th St. - J to I Sts.)	1	LS	\$292,000	\$292,000
9. 2012 Water CIP#7 (14th St. - I to H Sts.)	1	LS	\$292,000	\$292,000
10. 2012 Water CIP#8 (14th & Q to Broadway @ RR)	1	LS	\$2,919,000	\$2,919,000
11. 2012 Water CIP#9 (Broadway @ RR to 21st St.) ³	1	LS	\$154,000	\$154,000
12. 2012 Water CIP#17 (18th - North B to D Sts.)	1	LS	\$1,210,000	\$1,210,000
13. 2012 Water CIP#18 (D St. - 18th to 19th Sts.)	1	LS	\$292,000	\$292,000
14. 2012 Water CIP#19 (D St. - 19th to Alhambra) ³	1	LS	\$3,064,000	\$3,064,000
15. 2012 Water CIP#29 (15th St. - Q to Broadway)	1	LS	\$2,450,000	\$2,450,000
16. 2012 Water CIP#42 (6th St. - Q to Broadway)	1	LS	\$2,483,000	\$2,483,000
17. 2012 Water CIP#43 (Brdwy & 6th to Fremont) ³	1	LS	\$1,612,000	\$1,612,000
18. 2012 Water CIP#48 (Front St. - T to U Sts.)	1	LS	\$552,000	\$552,000
TOTAL WATER SYSTEM IMPROVEMENTS				\$33,018,000



Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The 2012 Water CIP project costs are based on the estimates from the 2012 CIP Programming Guide with the costs adjusted from the April 2012 dollars based on an ENR Construction Cost Index (CCI) 20 cities of 9273 to the December 2016 ENR-CCI of 10530 20 cities. Adjusted costs are rounded to the nearest \$1,000.
3. The 2012 Water CIP project is only partially located within the CCSP area. The estimated cost was adjusted as a portion of the overall project cost by using the ratio of the length within the CCSP to the overall project length. Adjusted cost is rounded to the nearest \$1,000.



PROJECT PRIORITIZATION

General

The purpose of this section of the report is to identify key areas where infrastructure investments can be made at minimal cost to maximize development in the near term. This report can serve as a guide for City planners and engineers and developers to determine which sites have the least infrastructure constraints.

CSSIP

The CSSIP study contains a prioritization ranking of all the projects. The ranking was determined based on several factors including:

- Cost Effectiveness
- NPDES Permit CSO Discharge
- Age of Existing Sewer Pipes
- Condition Assessment Drivers
- Cost Sharing with Other Departments
- City or Community Input

Each factor was assigned a different weighting depending on the level of importance. A ranking list of all 28 projects was prepared with five of the top eight projects within the CCSP area. However, four projects within the CCSP were at the bottom of the list. The relative ranking of each projects within the CCSP is the following:

- #4 WA5-3 W and 25th Street Storage
- #5 WA1-6 24th Street Storage
- #6 WA1-3 9th Street from G to L Streets
- #7 WA1-4 14th Street Storage
- #8 WA1-7 Grant Park
- #17 WA6-2 Riverside Blvd. Upsizing
- #18 WA1-1 Zapata Park
- #19 WA1-2 G Street and 9th Street
- #25 WA3-7 Target Parking Storage
- #26 WA1-5 N & 22nd Street Upsizing
- #27 WA5-2 T Street and 28th
- #28 WA5-1 T Street and 20th

CONSTRAINTS

Within the CCSP is one area the is especially congested with proposed and/or upsized systems. This is the area of 3rd Street from Capitol Mall to H Street. Within this area there are five proposed projects, all competing for space within the limited existing 3rd Street right-of-way including the following:

- 3rd Street CSS – 42-inch pipeline
- Basin 52 – 48-inch to 54-inch pipeline



- Water – 12-inch water main
- SMUD – 2 kV line extension
- Proposed Streetcar project

It is likely that alternative routing of some of these proposed systems may be necessary to avoid conflicts.

PRIORITY INVESTMENT AREAS

The opportunity sites, entitled planning projects, and commercial/office projects are located throughout the CCSP area. However, in some areas, especially along the some of the major commercial corridors, these sites are more clustered together – creating an opportunity for strategic infrastructure improvements in these areas to remove constraints that would be burdensome for a single development.

The City has completed the first two phases of the R Street redevelopment with R Street Market Place Phase 1 from 10th to 13th Streets. R Street Market Place Phase 2 project from 16th to 18th Streets is expected to be completed in 2017. The R Street Market Place Phase 3 project is anticipated to be completed in 2018.

Priority should be given to groups of developments within same the block or within blocks of each other in order to look for opportunities to construct the needed infrastructure at one time rather than piecemeal as each individual project develops. For instance, if a new or upsized water main is necessary, look for opportunities to expand the length of the construction project to include benefits to serve multiple sites.

The CCSP team has identified six locations within the CCSP as Priority Investment Areas (PIAs) where the concentrations of development would benefit from focused infrastructure investments. These PIAs are depicted in Figures 7A-7F.

Probable Estimates of Construction Costs have been prepared for the utility infrastructure with each of the six PIAs. The following are summaries and individual estimates of the utility infrastructure costs associated with each PIA together with the associated amount of development anticipated within each area. The order of the numbering of the PIAs is purely random and is not intended as a ranking of areas.

PIA #6 is the location of the constrained area of 3rd Street. The cost estimate for this area does not include any development as this was an area of interest in order to determine the magnitude of the costs for this critical juncture point.

Figure 7-B
Priority Investment Area #2

Legend

Street Lights

- Ornamental

Wastewater & Storm Drainage

- CIP
- CSSIP Sewer Pipes
- CSS Development Specific
- 3rd Street CSS
- Basin 52-Alternative 2

Water Mains

- 12"
- 8"
- CIP

Future Transmission Main

- 2030
- 2050

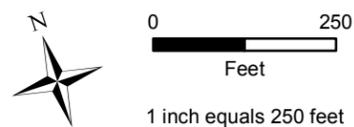
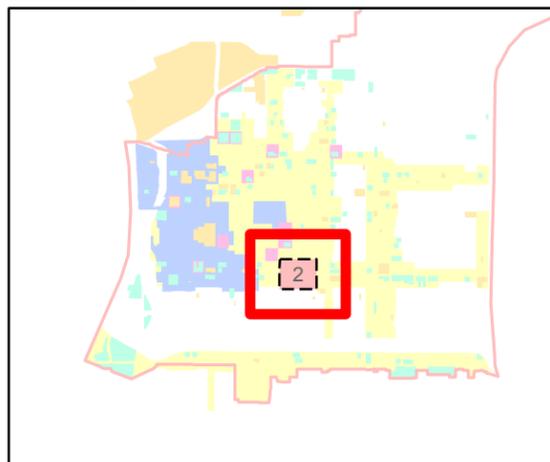
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line

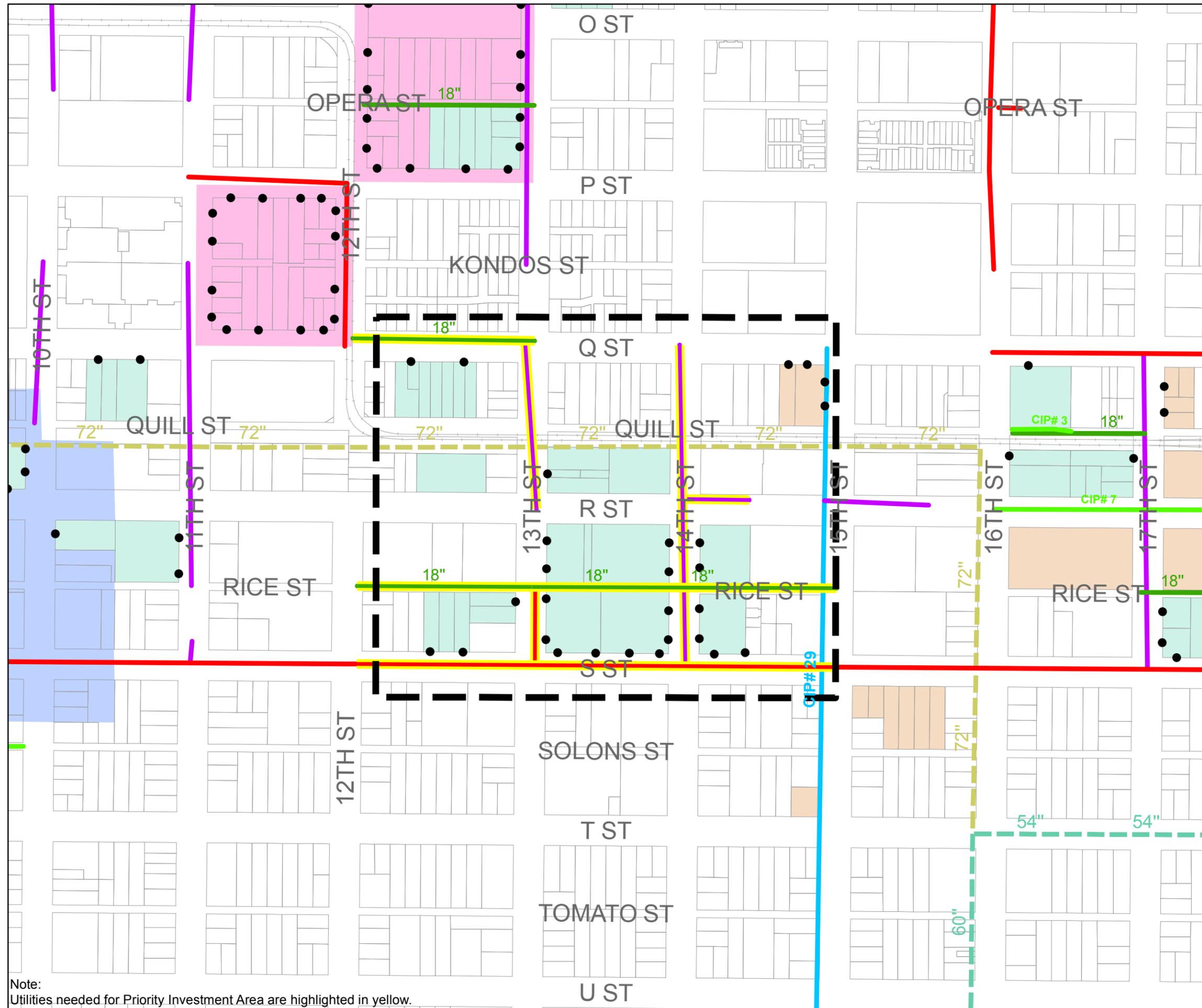
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Commercial/Office Only
- Basin 52
- Districts
- Streetcar
- Priority Investment Area Boundary

Key Map



N V 15



Note:
 Utilities needed for Priority Investment Area are highlighted in yellow.

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Figure 7-C
Priority Investment Area #3

Legend

Street Lights

- Ornamental

Wastewater & Storm Drainage

- CIP
- CSSIP Sewer Pipes
- CSS Development Specific
- 3rd Street CSS
- Basin 52-Alternative 2

Water Mains

- 12"
- 8"
- CIP

Future Transmission Main

- 2030
- 2050

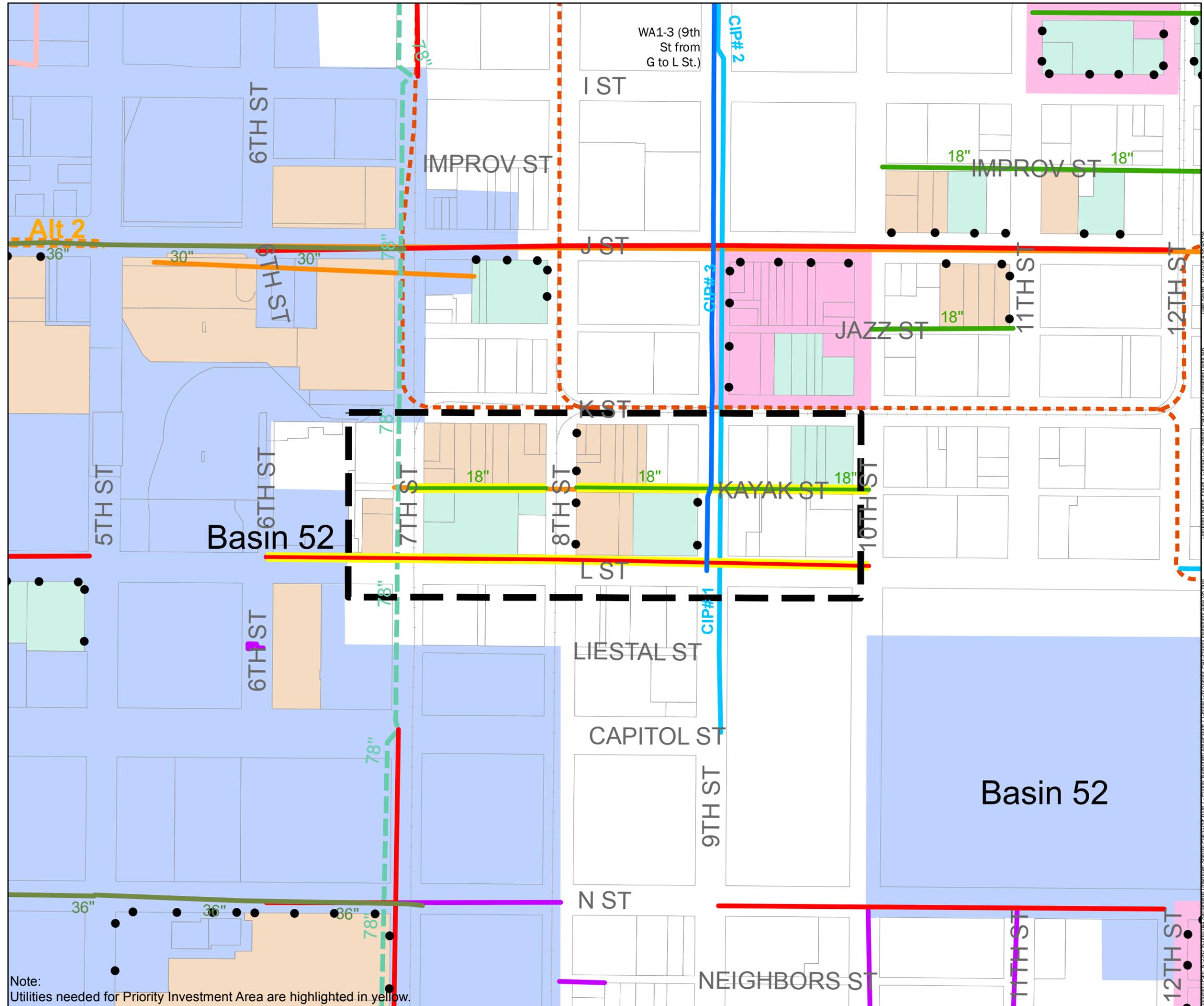
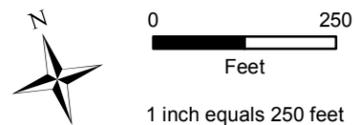
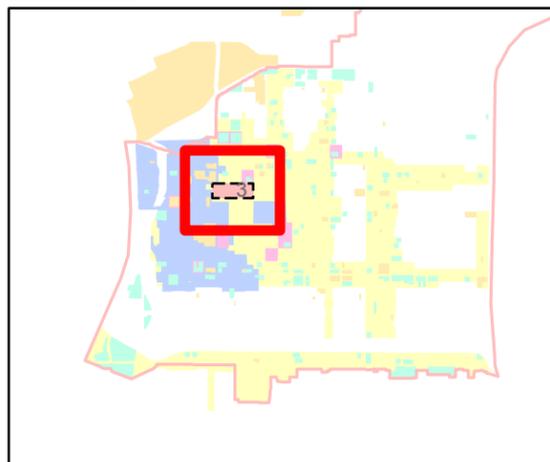
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line

Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Commercial/Office Only
- Basin 52
- Districts
- Streetcar
- Priority Investment Area Boundary

Key Map



Note:
 Utilities needed for Priority Investment Area are highlighted in yellow.

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Figure 7-D
Priority Investment Area #4

Legend

Street Lights

- Ornamental

Wastewater & Storm Drainage

- CIP
- CSSIP Sewer Pipes
- CSS Development Specific
- 3rd Street CSS
- Basin 52-Alternative 2

Water Mains

- 12"
- 8"
- CIP

Future Transmission Main

- 2030
- 2050

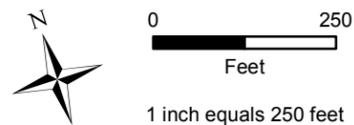
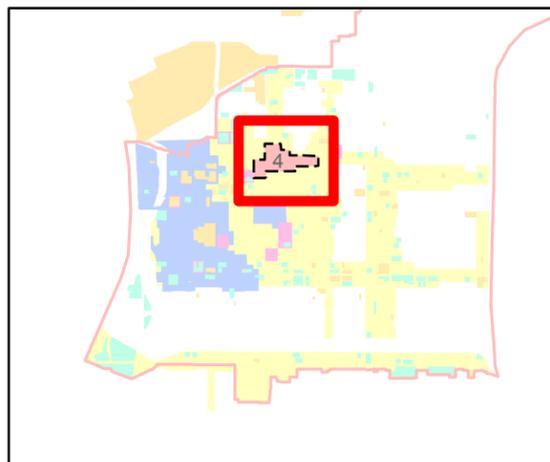
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line

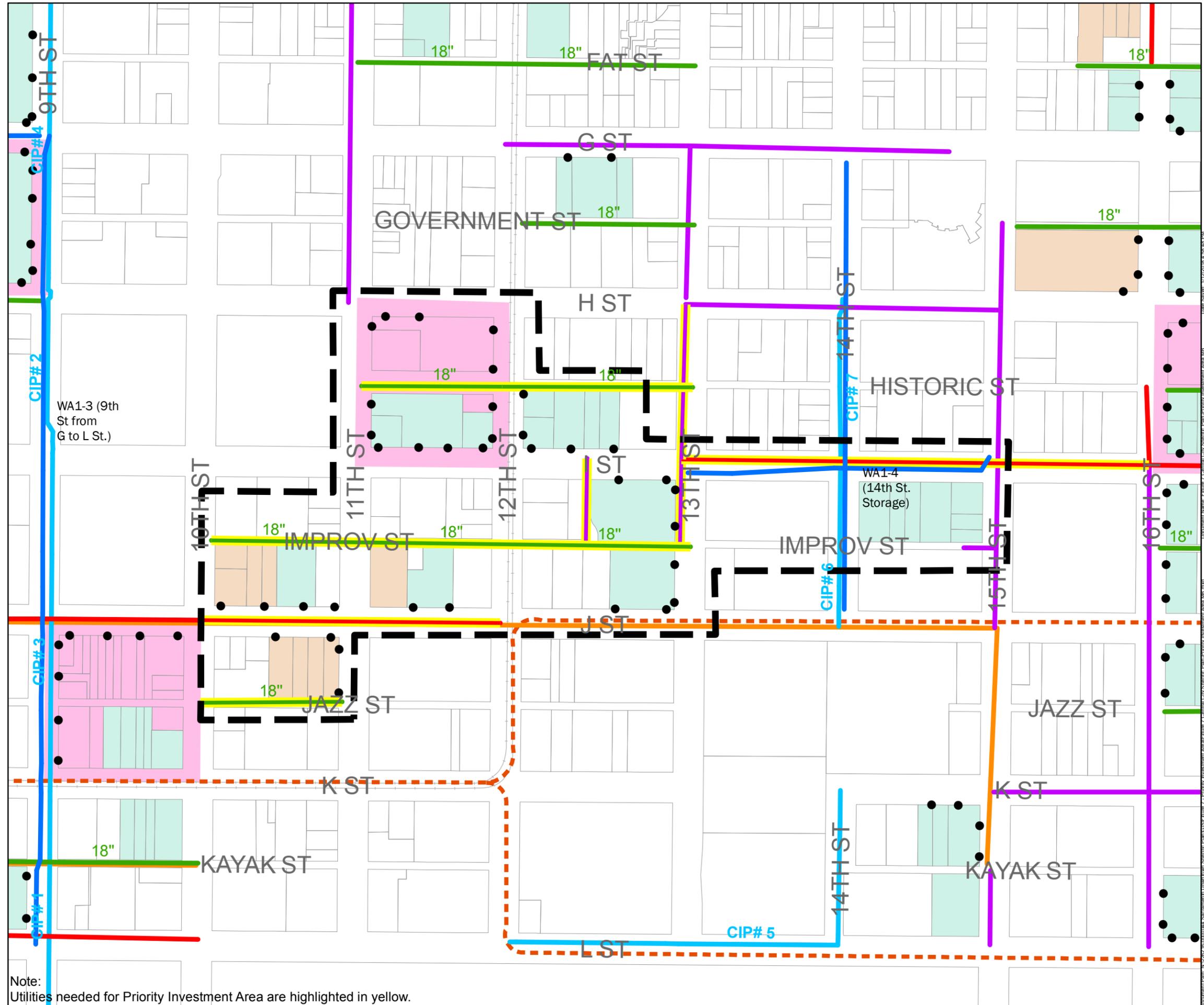
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Commercial/Office Only
- Basin 52
- Districts
- Streetcar
- Priority Investment Area Boundary

Key Map



N V 5



Note:
 Utilities needed for Priority Investment Area are highlighted in yellow.

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Figure 7-E
Priority Investment Area #5

Legend

Street Lights

- Ornamental

Wastewater & Storm Drainage

- 18" CIP
- CSSIP Sewer Pipes
- CSS Development Specific
- 3rd Street CSS
- Basin 52-Alternative 2

Water Mains

- 12"
- 8"
- CIP

Future Transmission Main

- 2030
- 2050

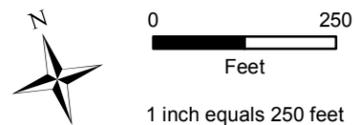
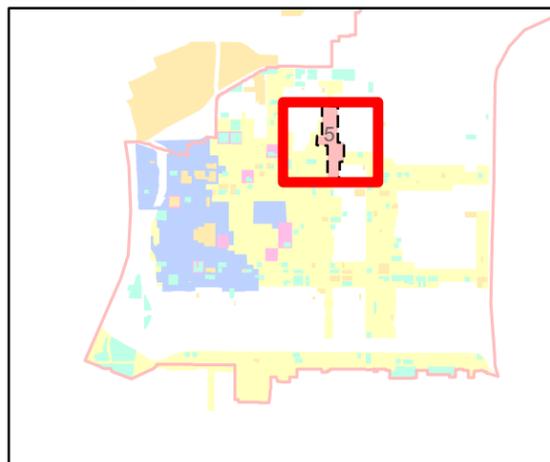
SMUD

- New Overhead Line
- New Underground Line
- Reconductor OH Line

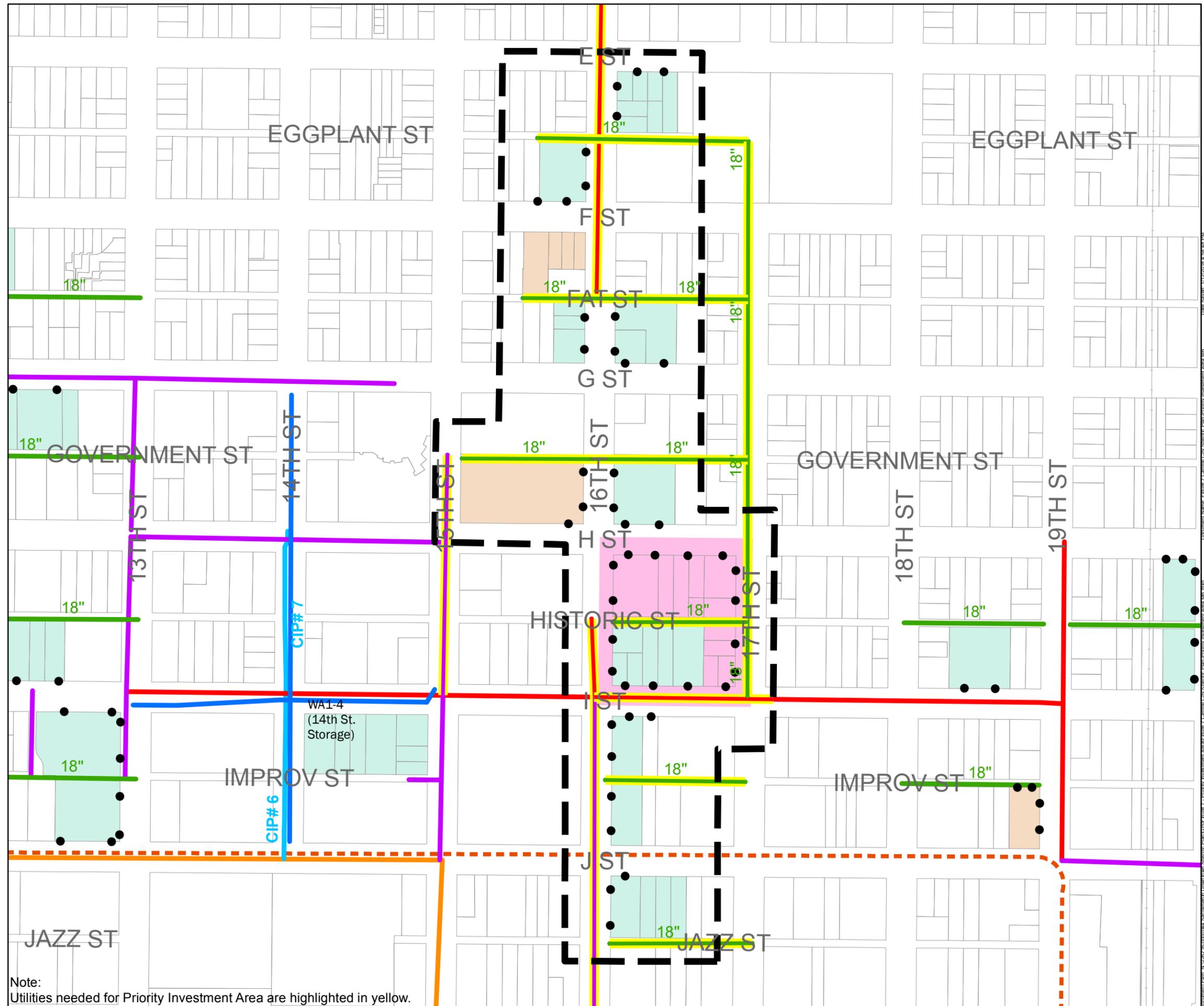
Land Use

- CCSP Boundary
- Parcels
- Opportunity Sites
- Planning Projects
- Commercial/Office Only
- Basin 52
- Districts
- Streetcar
- Priority Investment Area Boundary

Key Map



N V 5





SUMMARY OF PRIORITY INVESTMENT AREAS

DESCRIPTION	PLANNING PROJECTS		OPPORTUNITY SITES		COMMERCIAL/ OFFICE ONLY	TOTALS		INFRASTRUCTURE COST
	Residential Units	Commercial (s.f.)	Residential Units	Commercial (s.f.)	Commercial (s.f.)	Residential Units	Commercial (s.f.)	Amount
1. Priority Investment Area #1	253	6,875	797	95,647	0	1050	102,522	\$2,694,720
2. Priority Investment Area #2	73	8,800	394	47,318	0	467	56,118	\$1,151,940
3. Priority Investment Area #3	337	161,829	373	44,755	0	710	206,584	\$722,190
4. Priority Investment Area #4	194	4,480	606	72,719	121,800	800	198,999	\$1,462,380
5. Priority Investment Area #5	155	0	294	35,293	108,800	449	144,093	\$2,396,250
6. Priority Investment Area #6	0	0	0	0	0	0	0	\$5,158,900
TOTALS	1,012	181,984	2,464	295,732	230,600	3,476	708,316	\$13,586,380



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

PRIORITY INVESTMENT AREA #1

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	3,757	LF	\$390	\$1,465,230
2. Development Water Main, 8" Pipe ²	4,863	LF	\$150	\$729,450
3. Development Water Main, 12" Pipe ²	2,778	LF	\$180	\$500,040
TOTAL PRIORITY INVESTMENT AREA #1				\$2,694,720

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

PRIORITY INVESTMENT AREA #2

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	1,728	LF	\$390	\$673,920
2. Development Water Main, 8" Pipe ²	1,442	LF	\$150	\$216,300
3. Development Water Main, 12" Pipe ²	1,454	LF	\$180	\$261,720
TOTAL PRIORITY INVESTMENT AREA #2				\$1,151,940

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

PRIORITY INVESTMENT AREA #3

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	1,123	LF	\$390	\$437,970
2. Development Water Main, 8" Pipe ²	0	LF	\$150	\$0
3. Development Water Main, 12" Pipe ²	1,579	LF	\$180	\$284,220
TOTAL PRIORITY INVESTMENT AREA #3				\$722,190

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

PRIORITY INVESTMENT AREA #4

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	2,494	LF	\$390	\$972,660
2. Development Water Main, 8" Pipe ²	854	LF	\$150	\$128,100
3. Development Water Main, 12" Pipe ²	2,009	LF	\$180	\$361,620
TOTAL PRIORITY INVESTMENT AREA #4				\$1,462,380

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

PRIORITY INVESTMENT AREA #5

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	4,433	LF	\$390	\$1,728,870
2. Development Water Main, 8" Pipe ²	1,886	LF	\$150	\$282,900
3. Development Water Main, 12" Pipe ²	2,136	LF	\$180	\$384,480
TOTAL PRIORITY INVESTMENT AREA #5				\$2,396,250

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.



PROBABLE ESTIMATE OF CONSTRUCTION COSTS

PRIORITY INVESTMENT AREA #6

DESCRIPTION	QUANTITY	UNIT OF MEASURE	UNIT PRICE	AMOUNT
1. CSS Development, 18" Pipe ¹	0	LF	\$390	\$0
2. Development Water Main, 8" Pipe ²	798	LF	\$150	\$119,700
3. Development Water Main, 12" Pipe ²	0	LF	\$180	\$0
4. 3 rd Street CSS Relief Sewer ³	1	LS	\$3,855,500	\$3,855,500
5. Basin 52 Master Plan – Alt. #2 ⁴ – 30"	314	LF	\$504	\$158,300
6. Basin 52 Master Plan – Alt. #2 ⁴ – 42"	615	LF	\$706	\$433,900
7. Basin 52 Master Plan – Alt. #2 ⁴ – 48"	242	LF	\$806	\$195,100
8. Basin 52 Master Plan – Alt. #2 ⁴ – 54"	437	LF	\$907	\$396,400
TOTAL PRIORITY INVESTMENT AREA #6				\$5,158,900

Notes:

1. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, manholes, inlets, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
2. The estimated per linear foot unit price includes the estimated costs associated with the installation of the pipeline, valves, fittings, fire hydrants, backfill, and paving. Costs also assumes a 50% allowance for contingencies, engineering, and construction management.
3. The 3rd Street CSS Relief Sewer Project costs are based on preliminary design estimates from NV5, the consultant engineer currently working on the project design. The costs associated with the PIA #6 is a ratio of the approximate length of pipe of 2,431 LF in PIA #6 versus the overall 3rd Street CSS length of pipe of 6,526 LF.
4. The Basin 52 Master Plan costs are based on preliminary conceptual estimates for the likely preferred Alternative #2 dated 12/12/16. The updated Master Plan is still a draft so these estimates are subject to change. The unit costs associated with PIA #6 includes a 40% construction contingency.



APPENDIX A
STREET LIGHT EXAMPLES



ORNAMENTAL STYLE STREET LIGHT



MAST ARM STYLE STREET LIGHT



DUAL MAST ARM STYLE STREET LIGHT



SMUD STYLE STREET LIGHT



POST TOP STYLE STREET LIGHT



**REGIONAL TRANSIT
LIGHT & BANNER POLE STYLE STREET LIGHT**