Folsom City Council
Staff Report

MEETING DATE:	7/11/2023
AGENDA SECTION:	Consent Calendar
SUBJECT:	Resolution No. 11073 – A Resolution Authorizing the City Manager to Execute an Agreement with Economic & Planning Systems, Inc. for Professional Consultant Services to Update the Developmental Nexus and Impact Fee Study for Public Facilities in the Folsom Plan Area
FROM:	Finance Department

RECOMMENDATION / CITY COUNCIL ACTION

The Finance Department recommends that the City Council pass and adopt Resolution No. 11073 – A Resolution Authorizing the City Manager to Execute an Agreement with Economic & Planning Systems, Inc. for Professional Consultant Services to Update the Developmental Nexus and Impact Fee Study for Public Facilities in the Folsom Plan Area.

BACKGROUND / ISSUE

The City of Folsom (City) is seeking the services of a Consultant to prepare an update of the comprehensive study of Developmental Impact fees (Impact Fees) and completion of a Nexus Study in accordance with the California Mitigation Fee Act (Act) for the development south of Highway 50 in the Folsom Plan Area (FPA). The most recent study was completed in August 2015. The City currently assesses impact fees on new residential and commercial development to mitigate the fiscal impact on police, fire, and general facilities; park facilities and equipment; transportation and roads; and other capital facilities.

The fees to be reviewed and/or updated are:

Stand Alone Impact Fees	Components of Combined Plan Area Fee
Solid Waste Capital Fee	General Capital Facilities Fee
Corporation Yard Fee	Library Fee
Transit Fee	Municipal Service Center Fee
Highway 50 Interchange Fee	Police Facility Fee
Highway 50 Improvement Fee	Fire Facilities Fee
	Park Development Fee
	Trails Fee

POLICY / RULE

Section 2.36.080, Award of Contracts of the Folsom Municipal Code states, in part, that contracts for supplies, equipment, services, and construction with an estimated value of $70,952 or greater shall be awarded by the City Council.

ANALYSIS

Finance Department staff prepared the Request for Proposal (RFP) and solicitated proposals by directly emailing seven selected firms, as well as via the City's website. The RFP was issued on June 5, 2023. A single proposal was received on June 16, 2023 from Economic & Planning Systems, Inc. (EPS) for $82,115.

Staff reviewed the submittal by EPS and found their proposal to be responsive to the RFP. The Finance Department has determined the proposal and submittal to be in order and recommends that the contract be awarded to EPS. EPS was selected based upon their extensive municipal consulting experience, detailed knowledge of the Folsom Plan Area, their approach to developing impact fees, and ability to meet the City's timeline.

EPS is located in Sacramento, CA, and has provided consulting services to the City as well as a variety of California cities, counties, and public agencies. The firm's references include the City of Sacramento, City of Fresno, and City of Woodland for Public Facilities Fee Program Studies and Development Impact Fee Program Updates. In addition, EPS already possesses much of the Folsom Plan Area's land use and demographic information from its work on FPA Specific Plan Infrastructure Fee administration on behalf of the City.

FINANCIAL IMPACT

The Nexus and Impact Fee Study contract with Economic and Planning Systems, Inc. would be authorized for a not to exceed amount of $82,115. Sufficient funds are budgeted and

available in the Folsom Plan Area Impact Fee Fund (Fund 472) in Fiscal Year 2023-24 for this agreement

ENVIRONMENTAL REVIEW

Not Applicable.

ATTACHMENTS

1. Resolution No. 11073 – A Resolution Authorizing the City Manager to Execute an Agreement with Economic & Planning Systems, Inc. for Professional Consultant Services to Update the Developmental Nexus and Impact Fee Study for Public Facilities in the Folsom Plan Area
2. Economic & Planning Systems, Inc.'s Proposal to Prepare an Update of the Nexus and Impact Fee Study for Public Facilities in the Folsom Plan Area

Submitted,

_____

Stacey Tamagni, Finance Director

ATTACHMENT 1

RESOLUTION NO. 11073

A RESOLUTION AUTHORIZING THE CITY MANAGER TO EXECUTE AN AGREEMENT WITH ECONOMIC & PLANNING SYSTEMS, INC. FOR PROFESSIONAL CONSULTANT SERVICES TO UPDATE THE DEVELOPMENTAL NEXUS AND IMPACT FEE STUDY FOR PUBLIC FACILITIES IN THE FOLSOM PLAN AREA

WHEREAS, the City Council of the City of Folsom annexed the area of land south of Highway 50 known as the Folsom Plan Area (FPA) as of January 2012, and

WHEREAS, an update of the Developmental Nexus and Impact Fee Study for Public Facilities is necessary to further the facilitation of development in the area, and

WHEREAS, Finance Department staff prepared the Request for Proposal, solicited proposals, and received a single proposal on June 16, 2023, from Economic & Planning Systems, Inc., and

WHEREAS, Finance Department recommends Economic & Planning Systems, Inc., by reason of their extensive municipal consulting experience, detailed knowledge of the Folsom Plan Area, approach to developing impact fees, and ability to meet the City's timeline; and

WHEREAS, sufficient funds are budgeted and available in the Folsom Plan Area Impact Fee Fund (Fund 472) in Fiscal Year 2023-24, in the amount of $82,115; and

WHEREAS, the agreement will be in a form acceptable to the City Attorney:

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Folsom authorizes the City Manager to execute an agreement with Economic & Planning Systems, Inc. for Professional Consultant Services to Update the Developmental Nexus and Impact fee Study for Public Facilities in the Folsom Plan Area for an amount not to exceed $82,115.

PASSED AND ADOPTED this 11th day of July, 2023, by the following roll-call vote:

AYES: Councilmember(s):
NOES: Councilmember(s):
ABSENT: Councilmember(s):
ABSTAIN: Councilmember(s):

_____
Rosario Rodriguez, MAYOR

ATTEST:

_____
Christa Freemantle, CITY CLERK

ATTACHMENT 2

Proposal

Nexus and Impact Fee Study for Public Facilities in the Folsom Plan Area

The Economics of Land Use

Prepared for:
City of Folsom

Prepared by:
Economic & Planning Systems, Inc. (EPS)

June 16, 2023

EPS #232085

Economic & Planning Systems, Inc.
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Table of Contents

Appendices

June 16, 2023

Adam Devlin
Senior Financial Analyst
City of Folsom
adevlin@folsom.ca.us

Subject: Folsom Plan Area Developmental Impact Fee Proposal; EPS #232085

Adam:

Economic & Planning Systems, Inc. (EPS) would appreciate the opportunity to prepare an updated Folsom Plan Area Developmental Impact Fee Study for the City of Folsom (City). As articulated in the enclosed proposal, EPS is very excited and extremely well-qualified to assist the City in updating the City's fees. EPS is a nationally recognized, full-service land economics consulting firm, experienced in public finance, real estate economics, regional economics, and land use policy.

Having completed hundreds of development impact fee nexus studies for jurisdictions throughout California, EPS excels in providing policy analysis supporting nexus deliverables, as well as working with engaged stakeholder communities, to clearly communicate the basis and results of our analysis. EPS is actively involved in multiple impact fee program formations or updates and is keenly aware of new state legislation (Assembly Bill [AB] 602) related thereto.

Managing Principal **Jamie Gomes** will serve as Principal-in-Charge of this project, providing guidance and input toward project delivery, with ultimate responsibility for the work product. Jamie can be reached by telephone at (916) 649-8010 and by e-mail at jgomes@epssac.com. Associate **Emilio Balingit** will serve as Project Manager and will conduct the day-to-day management of this project. Emilio can be reached by telephone at (916) 649-8010 and by e-mail at ebalingit@epssac.com. Additional EPS staff may assist in identifying, collecting, and analyzing data.

As is demonstrated in this proposal, EPS is keenly interested and perfectly suited to work with the City on this project. I am also confident you will find EPS's proposed work program exceptionally aligned with the City's needs.

The Economics of Land Use

Economic & Planning Systems, Inc.
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www.epsys.com

I look forward to the City's consideration of this proposal and invite you to call me if you have questions regarding EPS's interest and proposed approach to the City's fee program updates.

Sincerely,

ECONOMIC & PLANNING SYSTEMS, INC. (EPS)

Jamie Gomes
Managing Principal

1. Scope of Work

Project Understanding and Approach

EPS's understanding of the Project is based on a review of the City's Request for Proposals (RFP), the Folsom Plan Area (FPA) Specific Plan Fee and Stand-Alone Fees Nexus Study, prepared by Goodwin Consulting Group and dated August 19, 2015 (2015 Nexus Study), and the City's Municipal Code Section 3.120, which implements and codifies the FPA Fee Programs. Based on EPS's review of these documents, EPS understands that the City is seeking a comprehensive update to the FPA Specific Plan Fee and Stand-Alone Fees.

Based on EPS's current role as the fee administrator for the FPA Specific Plan Infrastructure Fee (SPIF) Program, as well as EPS's extensive work authoring public facility financing plans and nexus studies across the Sacramento Region and throughout California, EPS is aware that automatic inflationary adjustments using the Engineering News-Record's Construction Cost Index and Building Costs may not have kept pace with actual construction costs for infrastructure and public facilities in the region. In addition, based on the language in the RFP, EPS understands that the City has updated facilities master plans for several types of public facilities since the 2015 Nexus Study was adopted. As such, the following scope of work is based on the assumption that the number and type of improvements included in the fee program may need to be refreshed as compared with those included in the 2015 Nexus Study.

In addition, the 2015 Nexus Study included provisions regarding the combination or "pooling" of certain fees based on City needs and policy direction at the time. As part of this nexus study update, EPS will work with the City to evaluate current conditions, seeking input on whether new policy direction needs to be integrated into the updated fees. Further, new provisions of the California Mitigation Fee Act (implemented via AB 602) will need to be considered as part of the fee update. This proposal describes EPS's experience with these new legal provisions and proposed approach to address AB 602 in updating the fees.

The key to the success of this project will be early alignment between the City and EPS on the driving goals of the project—whether it be updating costs of public facilities improvements to better reflect the current construction cost environment, incorporating changes to the amount or type of facilities included in the FPA Fee Program, or a blend of both. With clear alignment on the goals of the project, EPS can assist the City with prioritizing City and EPS tasks such that the overall work program is completed in the most time- and budget-efficient way possible.

Overall, the EPS Team proposes an approach to this project that couples technical rigor with insightful policy analysis and targeted and timely outreach to the stakeholder community.

The EPS Team's approach to fee program analysis is based on understanding the local context and the technical and legal issues inherent in an impact fee study. This approach relies on a collaborative, iterative, and informed decision-making process. The EPS Team combines sound technical analysis, grounded in legally defensible nexus arguments, with ongoing policy direction from the various stakeholders, including public agency staff and elected officials, the local public, and the development community. These and other measures described in this section are key to completing the project successfully and on budget, within the specified time frame.

While a participatory process can help to achieve politically and economically acceptable fees, it is also important to maintain clear objectives to guide the study process. The ultimate project objective includes establishing a revised set of development impact fees that strike a mutually enforcing balance between infrastructure and public facilities and new development and investment in the City.

The EPS Team considers the following objectives to be the most important for an impact fee study:

- **The fees must be legally defensible.** The fees should be developed and implemented in a fashion that unambiguously complies with applicable State law. The fees should be based on explicit growth and cost assumptions and sound nexus arguments that ensure the types of improvements and facilities and the costs of the improvements and facilities are directly attributable to benefiting land uses.
- **The fees must be financially effective.** The fees developed should provide sufficient means for successfully funding the new improvements and required capital facilities targeted by the program. Given that fee revenues are likely to represent only one, albeit important, funding source for public facilities, the development impact fee program must be effectively integrated with other programs and resources to assure stakeholders (and developers who pay the fees) that the facilities will ultimately be built.
- **The fees must be politically and economically viable.** The fees developed in this process should reflect input from key stakeholders in the community to ensure they receive broad support. Although the technical steps provide the basis for completing the impact fee study, it is recognized that ultimate approval will require compromise and policy choices. To this end, it will be important for both the EPS Team and the City to work closely with key policy makers and other stakeholders throughout the process. In addition, it will be important to understand and monitor the economic implications of the fee

program to ensure financial burdens on development are reasonable and do not hinder growth. The inclusion of local interest groups throughout the process can engender support for, or reduce opposition to, the fees, making it easier to ensure approval from City policy makers and, ultimately, successful implementation by the development community.

Scope of Work

EPS has created a preliminary scope of work that includes the service tasks outlined in the RFP. As part of **Task 1**, EPS will confirm this scope of work with City staff and develop a detailed project schedule. EPS used this scope of work to determine a project fee amount as part of this proposal.

Task 1: Project Initiation and Project Management

EPS will work with City staff to confirm the overall project purpose and goals, clarify team roles, and refine each of the project scope tasks to ensure that the study will be both accurate and appropriate to the City's needs. EPS will discuss the specific fee categories with the City and confirm what methodological approach for cost allocation may be most appropriate (e.g., service population, resident population, service calls) depending on how development and population growth impact demand for each type of facility.

EPS will also prepare a detailed project schedule with specific deliverable dates that incorporates time for City review of draft work products and answer any questions pertaining to the successful development of the updated Nexus Study.

As part of this task, EPS will review the current FPA Public Facility Impact Fees, the 2015 Nexus Study to determine the methodology by which facility costs were estimated and how these costs were allocated across the Plan Area's land uses. This review will help to focus and prioritize EPS' and the City's work to those portions of the fee program that will require the most time and effort to update.

Additionally, EPS will review the City's existing facilities Master Plans, including the Citywide Capital Improvement Plan and master plans specific to the Folsom Plan Area, to further EPS's understanding of the range of facilities and improvements to be included in the updated fee program.

As part of this **Task 1**, EPS will meet with City staff from the Planning and Finance Departments to describe the fee update process and information required. Topics to be discussed at this meeting include:

- Review of overall work program and fee update process.
- Overview of Mitigation Fee Act, AB 602, and other relevant statutes and their implications.

- Capital Facilities Lists and Costs by Fee Type: Status of City Capital Improvement Programs (CIPs), Facility Master Plans, etc.
- Consultant information needs from City Staff.
- Meetings with City departments to develop/review capital improvements.
- Development pipeline and forecasts.
- Public Meetings and Stakeholders.
- Schedule and Next Steps.
- Communication Protocol.

Task 2: Data Collection and Development

Subtask 2.1: Update Land Use Projections and Demographic Assumptions

Land use information, including projections of future growth, will be important for allocating public facility needs of new development on a pro-rata basis relative to demand generated by existing uses. EPS will work with City Planning and other staff to align these land use projections with the fee program land use categories for each respective impact fee program.

EPS has a distinct advantage over other consultants because EPS already possesses much of the Plan Area's land use and demographic information from its work on FPA Specific Plan Infrastructure Fee administration on behalf of the City. This information includes both tabular data on the total development capacity of the Plan Area by land use type, total development by land use to date, and projected absorption of residential uses by unit type through 2025. In addition, EPS will review relevant current and long-range planning documents and data from the City, including the following documents:

- Previous development impact fee studies.
- General Plan.
- Adopted budget.
- Development impact fee schedules.
- Specific Plans, Master Plans, and CIP information.
- Municipal Code Sections (as necessary).

Finally, EPS will draw on available Census data and other sources to update key demographic assumptions for purposes of the fee program calculations, including persons per household, employment densities, and other key assumptions that may be needed.

Subtask 2.2: Update Public Facility Cost Estimates

As described further in the **Project Understanding** section above, EPS assumes that inflationary adjustments have not been sufficient in keeping facilities' costs close to actual construction or purchase costs for the facilities and equipment included in the fee program, or the City desires to change the improvements included in the updated Fee Program. Based on this assumption and the language in the RFP, EPS will work with appropriate City departmental staff to update cost estimates for public facilities included in the updated Fee Program.

For all development impact fees, EPS will work with City staff to obtain the list of public facility and infrastructure requirements and associated costs that will constitute the development impact fee improvement program for each of these fee categories (it is assumed that the City will provide these lists and the associated costs). Individual improvement items will include those that are proposed to be funded, all or in part, by the different development impact fees. Building from **Task 1**, EPS will further review relevant City capital facility planning documents, including the City's CIP and existing facility master plans. EPS will rely on City staff to coordinate all interviews with relevant department members to gain a comprehensive understanding of the current and future public facility needs.

EPS will review the City's capital facilities needs and identify which facilities can be included in the development impact fee improvement program from a Mitigation Fee Act/nexus standpoint. Special attention will be paid to ensure that cost estimates include all appropriate and allowable cost items (e.g., land acquisition, construction costs, vehicles, and certain types of equipment). If the fee update is required to comply with new mitigation fee act provisions, enacted by AB 602, the nexus study update also will need to include a CIP. EPS will work with City staff to ensure the CIP is compliant with legal requirements.

In the event that cost estimates for some improvements require additional research and expertise to prepare, the following optional task would be included in the Work Program. If all cost estimates are able to be developed by working directly with departmental staff or by applying appropriate cost adjustment factors, then the optional subtask will not be necessary.

OPTIONAL Subtask 2.3: Prepare Further Detailed Cost Estimates

EPS understands that, given staffing and potential time constraints, the City may need EPS to complete some or all of the cost estimates for various projects not included in the master plans. In those circumstances, EPS will be prepared to assist the City in developing cost estimates for those facilities. Depending on the nature of the cost estimates required, EPS will either prepare the cost estimates itself or engage a specialist cost estimator.

If EPS prepares cost estimates, they will be based on a review of comparable facilities constructed in other jurisdictions. For example, EPS may need to research the average construction prices for park improvements or fire and police stations.

Note that a budget has not been estimated for this optional subtask since it is unknown if this subtask will be required or the extent to which further work on cost estimates will be needed.

Task 3: Fee Calculation and Analysis

EPS will prepare the nexus-based cost allocation necessary to develop a preliminary maximum development impact fee schedule for review by City staff for the following development impact fees:

- Solid Waste Capital
- Corporation Yard
- Transit
- Highway 50 Interchange
- Highway 50 Improvement
- Traffic
- General Capital Facilities
- Library
- Municipal Service Center
- Police Facility
- Fire Stations
- Park Development
- Trails Development

Subtask 3.1: Determine Fee Program Approach and Methodology

Several common approaches to calculating impact fees attributable to new development exist, including the following methodologies:

- **Existing Facility Level of Service:** This approach determines costs attributable to future development based on current facility inventory, demographic data, and the resulting existing service-level standard. Facility needs attributable to new development are then computed by applying current service-level standards and unit costs to future development projections.
- **Facilities Master Plan Approach:** Under this approach, the local agency identifies total facility needs through development of a facilities or infrastructure master plan and associated capital improvement program. Impact fee calculations then must determine the appropriate proportion of planned future facilities attributable to demands generated by new development.

The approach used to determine fee program costs may vary based on the specific infrastructure category or public facility under consideration, and in certain cases, a hybrid approach combining the two methodologies may be appropriate. EPS will begin with the assumption that the current fee allocation

methodologies are both: (1) efficiently collecting revenue to fund the public facilities identified in the 2015 Nexus Study and (2) were compliant with State law on proper nexus and impact attribution at the time they were adopted.

However, since the 2015 Nexus Study and the FPA Fees were adopted, the State passed AB 602), which requires that all development impact fees adopted after July 1, 2022 be levied proportionately per square foot for residential development. Alternatively, if all of three specific findings can be made for each fee component, the City may comply with AB 602 by describing how those findings have been made and thus fees for residential development may not all be proportionate to building square footage. EPS is working on several active impact fee studies affected by AB 602 and will bring that experience to bear in this assignment.

EPS will discuss these options with City staff, including the City Attorney/Counsel, to determine the preferred approach(es) for the different fee categories. Because this is a new State requirement, there are multiple ways being explored and implemented to address these new requirements.

Subtask 3.2: Prepare Cost Allocation Model

Based on the selected fee program approach(es) and using the land use assumptions and infrastructure needs compiled under the prior task, as well as the City's Master Plans and associated cost allocation identification, EPS will prepare a cost allocation model that appropriately assigns fee program costs to new development by land use category, net of any obligation of existing development.

The cost allocation models will first allocate the development impact fee program costs between new and existing development. EPS will ensure that facility needs and costs associated with existing deficiencies in service levels are identified as such and are excluded from the nexus analysis. For each fee component, EPS will then allocate the development impact fee improvement program costs to the land use categories, using industry standard methods to determine the benefit derived by each land use. Infrastructure and public facilities allocation will be based on the relative contribution of each land use type to the demand for the related improvement cost category. For example, storm drainage facilities are typically allocated based on the impervious surface area generated by each land use category.

Subtask 3.3: Prepare Maximum Allowable Fee Calculation

Based on the above-described cost allocation model, EPS will establish the maximum allowable fee levels for each facility and land use category. EPS will also indicate the level of fee revenues expected from these maximum fees and, where applicable, the level of revenues required from other sources to complement the Fee Program revenues. EPS will provide a table set indicating the

maximum fees by improvement type and land use for the City to review. The fees will include an administrative component to cover the cost of Fee Program implementation and administration.

EPS will discuss the maximum impact fee estimates with City staff and consider the outcomes in light of various issues, including: (1) the relative scale of the fee increase under the maximum fees; (2) particular areas of policy concern over fee levels; (3) potential technical adjustments that would alter the maximum fee levels; (4) the prioritization of capital improvements and the potential to reduce the project list; (5) the opportunities to fund capital improvements through other mechanisms; (6) the scale of funding required from other sources; and (7) comparisons to fee levels and cost allocation methods in other comparable communities.

Based on these discussions, EPS may prepare revised fee schedules reflecting the adjusted, recommended impact fee levels. It is important to note that if the City ultimately implements fees at a level lower than the maximum justified fee levels, the City will need to identify alternative sources of funds to backfill resulting Fee Program revenue shortfalls. EPS will advise the City regarding approaches to assuring that incentive programs and policy adjustments maintain nexus validity and meet AB 1600 reporting requirements.

Subtask 3.4: Fee Comparison

When considering fee updates and whether to adopt the maximum justifiable fees or a lower level, some cities are interested in understanding the fee levels charged for the same capital facility types in peer or neighboring jurisdictions. In tandem with ***Subtask 3.3***, EPS will conduct a fee comparison. Under this task, EPS would work with the City to identify up to five (5) jurisdictions of interest and then research and compile the relevant fee comparison information.

Task 4: Prepare Development Impact Fee Program Nexus Study

EPS will prepare a comprehensive report that will provide the key background information, the technical analysis, the recommended fee levels, the required nexus findings under the Mitigation Fee Act, and the implementation and administration framework. To the extent necessary, EPS will consult with City staff should it become necessary to defend the development impact fees because of legal or other challenges.

Subtask 4.1: Prepare Administrative Draft Report

EPS will prepare an Administrative Draft Development Impact Fee Program Nexus Study documenting the Fee Program update process, approach, methodology, and policy alternatives for City consideration. The report will include individual technical sections documenting the method, assumptions, and calculation of the

maximum allowable fee levels, as well as the requisite nexus findings. The report will also describe the Fee Program implementation.

All assumptions, analysis procedures, findings, graphics, and recommendations will be supported by rigorous technical analysis and will be documented in a clear, accessible, and transparent manner throughout the report and technical appendices. The report will discuss the applicable statutory and legal framework and reference supporting policy documents, including the General Plan and the infrastructure master plans.

The nexus methodology will satisfy AB 1600 requirements, offering the following findings for each fee component:

- Identify the purpose of the fee.
- Identify the use of the fee. If the use is financing public facilities, the facilities must be identified.
- Demonstrate a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.
- Demonstrate a reasonable relationship between the need for a public facility and the type of development project on which the fee is being imposed.
- Demonstrate a reasonable relationship between the amount of the fee and the cost of the public facilities attributable to development on which the fee is imposed.

If, as part of this update, the City decides not to establish fees directly proportional to residential unit square footage, this report will also include the necessary findings to satisfy the requirements of AB 602.

Subtask 4.2: Prepare Public Review Draft Report

EPS will revise the Administrative Draft Report according to a set of consolidated comments on the report from the City and will prepare a Public Review Draft Development Impact Fee Program Nexus Study. EPS will also prepare an associated PowerPoint presentation that will be presented at a meeting of key stakeholders and at a City Council meeting.

The purpose of these meetings will be to relay the technical components of the analysis, identify key fee program variables affecting the maximum justified fee levels, answer questions, offer clarifications, and solicit community and stakeholder input regarding the "optimal" fee level.

Subtask 4.3: Prepare Final Report

Once the technical analysis and recommended fees have been described and relevant feedback received, EPS will work with the City to determine a final recommended fee schedule and other fee program parameters. EPS will prepare a Final Development Impact Fee Program Nexus Study reflecting any changes, which will be considered for adoption at a City Council meeting. Following the meeting, EPS will make any revisions that may be requested by the City Council.

Subtask 4.4: Calculation Spreadsheets and Methodology

EPS will provide the City with the Excel-based model used to (1) compile the costs of public facilities by type, and (2) allocate these costs across each land use. EPS will also hold one meeting with relevant City staff to present the structure of the model and ensure that City staff fully understand the methodology used to construct the model. EPS will also train City staff at this meeting to update the model to account for inflationary adjustments using relevant indices such as the Consumer Price Index, Construction Cost Index, and the Building Cost Index.

Task 5: Presentation of Materials

Beyond the Project Initiation Meeting in **Task 1**, the departmental check-ins and other noted meetings in **Task 1**, and the discussions on comments on Technical Reports in **Task 6**, EPS will lead and present at 4 public meetings, including 1 City Council Study Session reviewing the Public Review Draft Technical Report, one City Council Adoption Hearing/First Reading of the Final Technical Report, as well as 2 public stakeholder meetings with participants to be determined by City staff (though with at least 1 focused on the development community). For the 2 stakeholder meetings, it is assumed that City staff will organize the meeting and invite attendees and EPS will facilitate the meeting, present at the meeting, answer questions, and take notes. EPS will also support City staff in the preparation of staff reports for public meetings.

2. Qualifications

About EPS

EPS is a land economics consulting firm, experienced in the full spectrum of services related to real estate development, the financing of public infrastructure and government services, land use and conservation planning, and government organization.

EPS was founded on the principle that real estate development and land use-related public policy should be built on realistic assessment of market forces and economic trends, feasible implementation measures, and recognition of public policy objectives, including provisions for required public facilities and services. These are EPS's areas of expertise:

- Economic Development and Revitalization
- Housing Policy
- Parks and Open Space Economics
- Public-Private Partnership (P3)
- Fiscal and Economic Impact Analysis
- Land Use and Transportation
- Public Finance
- Real Estate Economics

Since 1983, EPS has provided consulting services to hundreds of public- and private-sector clients in California, Colorado, and throughout the United States. EPS has offices located in Oakland, Sacramento, and Los Angeles, California, and Denver, Colorado. EPS's clients consist of cities, counties, special districts, educational and other nonprofit institutions, multijurisdictional authorities, property owners, developers, financial institutions, and land use attorneys.

The professional staff of 46 includes specialists in public finance, real estate development, land use and transportation planning, government organization, and computer applications. The firm excels in preparing concise analyses that disclose risks and impacts, support decision making, and provide solutions to real estate development and land use-related problems.

Relevant EPS Practice Areas

Work related to this Study falls within *Public Infrastructure Financing and Impact Fees*, which is one of EPS's core practice areas and described in more detail below.

Public Infrastructure Financing and Impact Fees

EPS has evaluated, recommended, or supported implementation of a broad range of financing mechanisms for infrastructure improvements and ongoing public services. Specific services provided by EPS include forecasting demand to assist in infrastructure design, sizing, and timing; allocating capital costs among participating entities; identifying, forecasting, and establishing various funding mechanisms; formulating nexus studies/fee schedules, assessment rates, Special Tax Formulas, and fee ordinances; and assessing the impacts of capital financing alternatives on project feasibility and public finance negotiations.

EPS has particular expertise in the preparation of impact fee studies and programs, and has worked with dozens of cities, counties, and special districts to provide these services. EPS's impact fee-related products and services range from single-purpose fees focusing on particular facilities or subareas to more comprehensive, multi-improvement programs spanning entire cities or numerous jurisdictions. The firm is well-versed in the requirements of the Mitigation Fee Act (AB 1600) and associated legislation, and our impact fee work often includes revenue projections as well as assessments of the fees' impacts on new development.

EPS's expertise in real estate economics allows us to help public agencies ensure that desired private development investments remain feasible while also contributing to public improvements. This is particularly important where cities are considering the adoption of numerous new fees and other development charges. Also, our expertise in fiscal impact analysis helps public agencies understand the ongoing financial consequences of their public investment decisions. As requested in the RFP, EPS is providing a relevant sample of work in **Appendix B** that demonstrates EPS's expertise in the realm of nexus studies and impact fee programs. The attached report, completed for the City of Sacramento's Department of Utilities, demonstrates EPS's methodology for calculating fees and complying with the legal requirements of relevant regulations, including the Mitigation Fee Act and AB 602.

What Makes EPS Different?

Unlike some of our competitors, EPS works extensively with both public agencies and private developers. As a result, EPS has a deep understanding of public concerns for policy formation and stakeholder outreach, as well as for the development community's perspectives, feasibility concerns, and go/no-go decision-making processes. This experience supports and is supported by an analytical approach that stresses rigor, transparency, and objectivity rather than advocacy and one that results in a realistic view of the evolving limits of feasibility in financial markets. Through this approach, EPS engenders the trust of clients in both the public and private sector. In some public-private development projects,

EPS has started out working for the public agency and then later has been retained by the private developer, or vice versa.

In addition to an understanding of both the public and private side of development, EPS generally has a more robust and broader practice than its competitors. EPS's practice includes affordable housing and housing policy; real estate market analysis; reuse and revitalization strategies; and economic/fiscal impact analysis. As a result, EPS is able to address land use planning and policy from a more holistic perspective that includes the concerns of private developers, but also the economic development and fiscal realities of public agencies.

Lastly, as described above, EPS is uniquely familiar with the City of Folsom and the greater Sacramento region. From our office in Sacramento, EPS has assisted with public facilities financing plans, nexus studies, and fee administration in numerous jurisdictions in the area, including the cities of Sacramento, Elk Grove, Folsom, Rancho Cordova, Roseville, Rocklin, Woodland, and Citrus Heights, as well as Sacramento, El Dorado, Nevada, Placer, and Yuba Counties. Our current work in the FPASP Infrastructure Fee Program as well as our numerous projects throughout the region give us unique insight and an innate understanding of development economics in the City of Folsom, and our familiarity with City staff and processes ensures that communication on the project would be efficient and effective. In concert with EPS's institutional knowledge built over 40 years of work in public finance, this specific knowledge of the City of Folsom makes EPS uniquely qualified to provide the services requested by the City.

Key Personnel

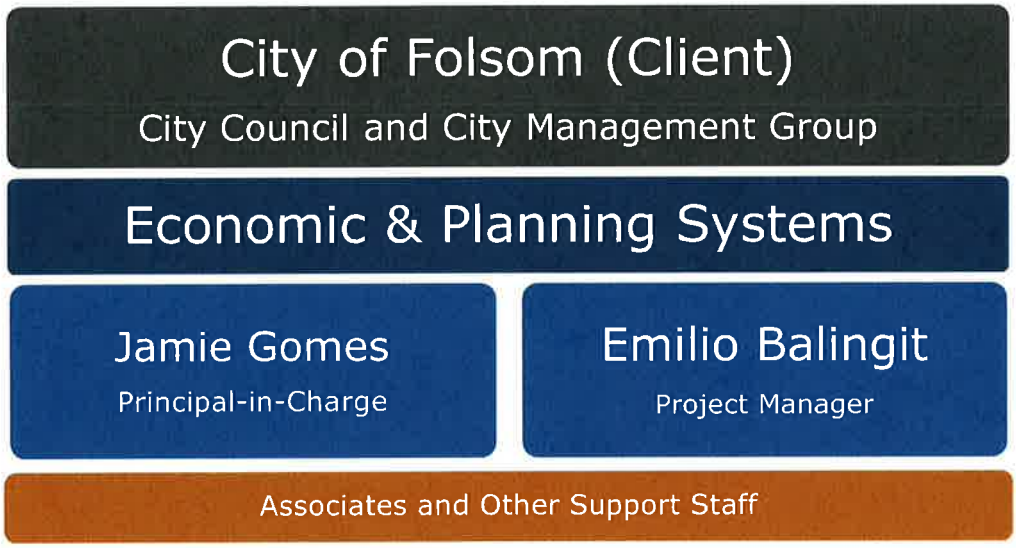
EPS will apply a team approach to this project, engaging City and other project stakeholders, as appropriate, in an ongoing and collaborative manner. EPS organizes projects to bring the most experienced in-house talent to each assignment. While EPS's staff works collaboratively, each project is assigned a Principal-in-Charge, with ultimate responsibility for project delivery, and a Project Manager, who is available to the client on a day-to-day basis. The role and background of key personnel for this project are summarized below, and detailed resumes are included in **Appendix A**.

Managing Principal **Jamie Gomes** will serve as Principal-in-Charge and will provide overall project guidance and direction to complete the consulting assignment, as seen in **Figure 1**. As one of EPS's impact fee practice leaders, Jamie offers impact fee policy and implementation expertise and leadership, informed by his experience working on a myriad of similar projects throughout California. Throughout his more than 25-year career with EPS, Jamie has managed many development impact fee studies in various jurisdictions, including the Cities of Elk Grove, Folsom, Roseville, Rancho Cordova, Sacramento, and Fresno, Nevada, and Yuba County. In addition, Jamie's practice has evolved into

active fee program administration of several plan-area fee programs in Folsom, Rocklin, Roseville, and Woodland. This experience offers Jamie insight regarding key technical issues, as well as potential implementation challenges, that allows for early identification and resolution of challenges to ensure timely completion of project deliverables. Additionally, Jamie is singularly qualified to provide project guidance on this fee update, having served as the Principal-in-Charge for the FPASP Public Facilities Financing Plan, the FPASP Infrastructure Fee Nexus Study, and the ongoing implementation of the SPIF Fee Program. Jamie's familiarity with the City of Folsom and the stakeholders in the Plan Area are a key attribute of EPS's advantage on this project.

Jamie will be available regularly over the duration of this project, overseeing all aspects of the work completed, attending project meetings and conference calls, and providing ongoing policy and other advisory support to the City on an ongoing basis.

Figure 1. EPS Project Organizational Chart



Associate **Emilio Balingit** will serve as Project Manager, will manage the day-to-day aspects of the project, and will be regularly available to the City. One of EPS's leading impact fee practitioners, Emilio offers impact fee policy and implementation expertise and leadership informed by his experience working on several similar projects throughout California. Over the course of his career with EPS, Emilio has contributed to several development impact fee studies including Fresno, Sutter County, Sacramento County, Merced, and Colusa County. Additionally, Emilio works closely with Jamie and serves as the Project Manager for EPS's work on the FPASP Infrastructure Fee Program implementation and administration. Like Jamie, Emilio's work on the FPASP Infrastructure Fee Program has given him unique insight into the Plan Area's development trends and

stakeholders that provide him with a capability to quickly initiate the proposed Public Facilities Fee Program update with minimal need to familiarize himself with the project's background.

Emilio offers excellent project management services, with extremely strong communication and organizational skills, as well as a personable and persistent approach that is particularly valuable to completing projects on an aggressive timeframe. Emilio will be available to the City on a day-to-day basis for the duration of this contract.

Project Profiles

Folsom Plan Area Specific Plan, Financing Plan, CFD Formations, and Specific Plan Infrastructure Fee Program

Sacramento County/City of Folsom, California

EPS was retained by the Folsom South Area Owners' Group (FSAG) to prepare a Public Facilities Financing Plan (Financing Plan) for the Folsom Plan Area Specific Plan (FPASP). The FPASP is located in the City of Folsom on approximately 3,500 acres, located south of U.S. Highway 50. The FPASP is envisioned to add approximately 10,000 dwelling units and 5.2 million building square feet of commercial space to the City of Folsom. The Financing Plan presented a comprehensive strategy to finance the backbone infrastructure and other public facilities required to serve the proposed development. The financing strategy included the use of city fees, school district fees, other regional agency fees, plan area fees, and several land-secured financing districts.

Subsequently, EPS was retained by the City of Folsom and the FSAG to help implement the financing mechanisms identified in the adopted Financing Plan. EPS has assisted in the formation of three areawide CFDs funding a variety of infrastructure and public services, as well as multiple development-project-specific CFDs aimed at funding backbone infrastructure required for the respective projects. Additionally, EPS authored the 2015 FPA Specific Plan Infrastructure Fee Nexus Study, completed an update to that Study in 2020, and is currently in the process of authoring another comprehensive update to the 2020 Study. Lastly, EPS has also been retained by the City of Folsom as the third-party Specific Plan Infrastructure Fee Program Administrator, a role in which the firm is still serving to this day.

Reference: Stacey Tamagni, City of Folsom Finance Chief Financial Officer, stamagni@folsom.ca.us, (916) 461-6080

Roseville Public Facilities Infrastructure Fee Nexus Study Update
Roseville, California

The City of Roseville's Public Facilities Development Impact Fee (PFF) Program was established in 1991. EPS prepared the most recent 2020 PFF Program Nexus Study Update, as well as the prior 2015 update.

The PFF Program funds new development's obligation to construct public facilities serving residents and employees in the City of Roseville. Fee program–eligible public improvements include Police and Public Safety Facilities; General Public Facilities such as Civic Centers, Corporation Yards, and other basic infrastructure; and Community Facilities such as libraries, parks and recreation facilities, community centers, and cultural facilities.

The proposed updated development impact fees for these facilities were established by allocating the costs of capital improvements needed to serve new development to the projected new development by residential and nonresidential land use category through buildout of the City of Roseville's General Plan. The cost allocations were based on the relative benefit derived from the improvements by each development type. Future development's share of future public improvement costs was based on planned facilities as determined by the City of Roseville and calibrated by existing level-of-service standards. The costs of the construction of public facility improvements required to cure existing level-of-service deficiencies were estimated and excluded from the PFF calculation.

The resulting development fees comply with the provisions of California Government Code Section 66000 et seq. The City of Roseville adopted the 2020 PFF Program Nexus Study Update in September 2020.

Reference: Dennis Kauffman, Assistant City Manager, City of Roseville, dkauffman@roseville.ca.us, (916) 774-5313

Fresno Development Impact Fee Nexus Studies for Parks, Major Streets, and Police and Fire Facilities—2016 Update
Fresno, California

Having recently completed a General Plan update, the City initiated a comprehensive update to its citywide development impact fee programs, with the goal of incorporating updated population and employment estimates, traffic analysis, park and recreation facility standards and public safety needs assessments. The City engaged EPS to prepare updated nexus studies establishing the maximum justified fees for Fire, Police, Parks, Regional Streets and New Growth Area Major Streets. With a primary focus on equity and with consideration to the City's economic development objectives, the fee program updates were calibrated to establish maximum justified fees based on each user's impact on the facilities in question (i.e., major streets, fire, police, and parks facilities).

EPS's analysis established development impact fees for these facilities by evaluating the capital improvement needs relative to existing and projected new development, the proportional demand for new facilities generated by each land use category and user type, and the provisions of Government Code Section 66000 et seq. Each fee program also accounted for existing service level deficiencies, fee program fund balances, debt service for bond-financed facilities, outstanding credit and reimbursement agreements, and other funding sources available to offset fee program costs. In addition, where supported by capital improvement programming and service level standards, the fee program analysis evaluated and accounted for differential facility demand characteristics associated with urban core development relative to new growth development areas.

The final nexus study reports were adopted by the City of Fresno in December 2016. After the adoption of these nexus studies, EPS prepared an additional Fire Nexus Study Update that updated the fire fees. The purpose of this report was to update the fire fees to reflect substantially higher Fire Capital Improvement Plan costs than anticipated at the time the 2016 Nexus Study was completed. This Fire Nexus Study Update was adopted by the City of Fresno in June 2019. Most recently, EPS completed analysis for new fee amounts for fire facilities, police facilities, major roads and bridges, and parks, in addition to a nexus study for each of these fees in 2022. The updated fees for fire facilities, police facilities, and major roads and bridges were adopted by the City in 2022, and the City will consider the updated park fee in 2023.

Reference: Andrew Benelli, Assistant Director of Public Works, City of Fresno, andrew.benelli@fresno.gov, (559) 621-8650

North Natomas Development Impact Fee Nexus Study and Financing Plan Update

Sacramento, California

EPS has worked with the City of Sacramento for over 25 years on the development and implementation of the North Natomas Community Plan infrastructure and public facility fee program. Key to the financing strategy was implementation of the North Natomas Development Impact Fee Nexus Study, which established the following fees: PFF, Transit Fee, Public Facilities Land Acquisition Fee, and Regional Park Land Acquisition Fee. North Natomas development is well underway and many of the original improvements have already been completed. The PFF currently funds transportation, fire, library, community center, and bikeway improvements.

The North Natomas Nexus Study specifies the required remaining backbone infrastructure, regional park land, and public land needed to serve the residents and employees in North Natomas and allocates the improvement and land costs to the remaining development using appropriate common use factors that measure the relative benefit to each land use. In addition, the PFF fee-funded

costs are adjusted by the available account balance and outstanding fee credits and reimbursements owed to developers for the construction of infrastructure. The nexus study details implementation of the fee program, including collection of the fees, the use of fee credits and reimbursements, the required methods by which the different costs and fees are adjusted annually, the procedures for issuing and using fee credits, and the method by which outstanding fee credits and reimbursements are adjusted annually.

In addition to establishing the original North Natomas Nexus Study in 1995, EPS has worked with the City of Sacramento to provide ongoing implementation and administration support, including updates in 1999, 2002, 2005, 2008, and most recently, 2017. EPS's work on the North Natomas Nexus Study not only established the legally required nexus findings needed to establish and update the fee, but through ongoing implementation and administration work, EPS has ensured that the fee program is financially effective. Accounting for changes in future development projections, facilities requirements, facility cost estimates, cost allocation methodologies, and remaining credits and reimbursements, EPS's analysis and updates have ensured that facilities are constructed when needed to serve new development.

The City of Sacramento adopted the 2017 North Natomas Development Impact Fee Nexus Study Update in February 2018, continuing the long-term successful implementation of the plan and associated financing strategy.

Reference: Sheri Smith, Special District Manager, City of Sacramento, ssmith@cityofsacramento.org, (916) 808-7204

Nevada County Parks and Recreation Facilities Fee Nexus Study

Nevada County, California

In 2018, the County of Nevada engaged EPS to prepare an update of the county's Park and Recreation Facilities Fee Nexus Study (Nexus Study) for the western portion of unincorporated Nevada County. The previous Nexus Study had been prepared in 1997 and fee levels had not been escalated or adjusted since that time. The effort was further complicated by the need to coordinate with 3 independent park and recreation districts as well as the incorporated Cities of Grass Valley and Nevada City, all of which work with Nevada County to provide park and recreation services to western Nevada County residents. Working with an engaged stakeholder community focused on improving parks and recreation services in Nevada County, as well as the several jurisdictions involved in providing park services, EPS updated the impact fee calculations for 4 distinct recreation benefit zones in Nevada County. The updated Park and Recreation Facilities Fee Study included Quimby land acquisition, park development and trail improvements. The nexus study update required detailed analysis by benefit zone to establish demographic, land valuation and other assumptions, including establishing service levels standards with consideration to existing service levels

relative to policy standards and the benefit derived by the provision of private park amenities in certain communities.

The Nevada County Board of Supervisors unanimously adopted the updated Park and Recreation Facilities Fee Nexus Study in December 2018.

Reference: Jeffrey Thorsby, Senior Management Analyst, Nevada County Board of Supervisors, jeffrey.thorsby@co.nevada.ca.us, (530) 265-7247

3. References

Per the City's RFP, EPS has provided the following list of references for whom we have most recently provided services related to public facilities development impact fees and nexus studies. Additionally, EPS's final report for the City of Sacramento's Department of Utilities Development Impact Fee and Nexus Study is included in **Appendix B** as a sample of the firm's work.

EPS Reference Matrix			
Project Name	**Project Dates/ Status**	**Contact Information**	**Public Facilities Included In Fee Program**
City of Sacramento Department of Utilities Development Impact Fee and Nexus Study	**2021 – 2023** Public Draft Accepted February 2023. Pending Adoption by City Council.	**Kelly Sherfey, MPA, CFM** Program Specialist City of Sacramento Department of Utilities ksherfey@cityofsacramento.org (916) 808-1466	Water Systems Separated Sewer System Combined Sewer and Storm Drain System Separated Storm Drain System
Fresno Major Streets, Public Facilities, and Park Development Impact Fees	**2021 – 2023** Police, Fire, and Roads fees adopted 2022. Parks Fee to be considered in 2023.	**Andrew Benelli** Assistant Director of Public Works/City Engineer City of Fresno Andrew.Benelli@fresno.gov (559) 621-8723	Police Facilities Fire Facilities Major Roads and Bridges Parks
Woodland Research and Technology Park Public Facilities Financing Plan and Impact Fee Nexus Study	**2018 – 2023** Updated Nexus Study to comply with AB602 in 2023. Client is reviewing Administrative Draft of Nexus Study.	**Brent Meyer** Community Development Director/City Engineer City of Woodland brent.meyer@cityofwoodland.org (530) 661-5947	Major Streets Storm Drainage Water System Sewer System Parks and Open Space

4. Disclosures and Conflicts of Interest

EPS has provided consulting services to hundreds of public- and private-sector clients throughout the United States since 1983. EPS offers consulting services in real estate market analysis, feasibility analysis, fiscal impact analysis, infrastructure financing strategies, affordable housing strategies, and similar areas of expertise that are of value to local jurisdictions and authorities, as well as to developers. EPS has been involved in several public/private development negotiations throughout the United States, usually under contract to the public-sector party, but sometimes under contract to the private-sector party.

The firm's reputation and success have been built on EPS's ability to perform objective and transparent analyses that allow all stakeholders to understand the economics of development and the financial implications of various approaches to projects' programmatic features and financing. This emphasis on objectivity, rather than advocacy, is one of EPS's official "core values" and is instilled in EPS's staff from their first day with the firm.

EPS strives to inform all potential clients of any conflicts of interest, real or perceived, so they can decide whether or not EPS is the best firm to provide consulting services, given the unique technical requirements of the assignments, as well as the political considerations in place. EPS is proud of its longstanding success in providing quality services to a wide variety of clients and believes this breadth of experience enables EPS to understand the perspectives and needs of all parties involved in complex urban development. In an effort to be fully transparent and avoid any perceived conflicts of interest, the following projects and clients are disclosed below.

As mentioned above, EPS assists with the implementation of the Folsom Plan Area Specific Plan in the following, ongoing ways:

- **Administration of the Specific Plan Infrastructure Fee Program.** Client: City of Folsom.
- **Implementation of the Folsom Plan Area Phase 2 Water Improvements.** Client: Folsom Implementation Group Cost Sharing, LLC/Folsom South Area Owner's Group.

During these ongoing engagements, EPS maintains open lines of communication between city staff and development community representatives.

In addition, EPS has had contracts for technical assistance related to either FPASP fee programs or CFD special tax analyses with the following entities operating in the Folsom Plan Area:

- Lewis Management Corporation
- Westland Capital Partners
- Dignity Health
- Eagle Commercial Partners, LLC
- Lennar Corporation
- Toll Brothers, Incorporated
- Taylor Morrison Homes of CA
- Elliott Homes
- The New Home Company
- Gragg Ranch Recovery

5. Insurance

EPS maintains insurance in compliance with the City insurance requirements in Exhibit B of the RFP. In current contracts with the City, EPS has requested, and the City has granted, the following two exceptions to Exhibit B:

- **Exception to Section 2.b:** EPS does not own any vehicles and cannot accommodate symbol 1 (any auto). EPS's automobile liability insurance covers symbols 8 & 9 (non-owned and hired autos only).
- **Exception to Section 6.e:** EPS's insurance provider will not provide notice of cancellation to additional insureds, nor will the policy state this. This is the insurance provider's corporate policy. EPS will provide notice of insurance cancellation to the City.

6. Cost Proposal

Proposed Budget

EPS agrees to complete the above work program on a time and materials basis not to exceed **$82,115**. The approximate level of effort by task and staff level is shown in **Table 2.** Please note that this budget does not include optional ***Subtask 2.3***. If the City and EPS agree that this task is required, EPS will submit a scope of work and budget amendment based on the specific facilities for which EPS will prepare cost estimates.

EPS bills monthly for its services and will transmit invoices per the City's instructions.

Table 1
EPS Proposed Budget
Folsom Plan Area Specific Plan Fee and Stand Alone Fee Nexus Study Update

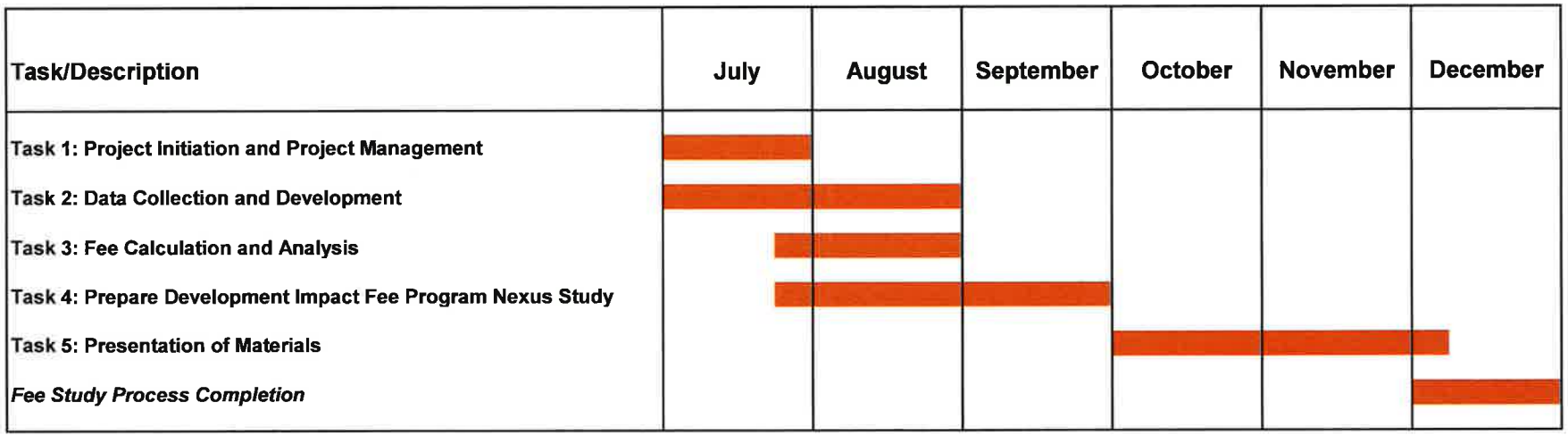
Subtask/Description	Principal-in-Charge Gomes	Project Manager Balingit	Other Technical Staff	EPS Production Staff	Staff Cost Subtotal	Direct Expenses [1]	Total EPS Costs
Task 1: Project Initiation and Project Management	6	18	0	0	$5,250	$0	**$5,250**
Task 2: Data Collection and Development							
Subtask 2.1: Update Land Use Projections and Demographic Assumptior	2	4	6	0	$2,250	$0	**$2,250**
Subtask 2.2: Update Public Facility Cost Estimates	12	36	40	1	$16,395	$0	**$16,395**
Subtask 2.3: Prepare Further Detailed Cost Estimates (optional) [2]	0	0	0	0	$0	$0	**$0**
Task 3: Fee Calculation and Analysis							
Subtask 3.1: Determine Fee Program Approach and Methodology	6	12	0	0	$4,140	$0	**$4,140**
Subtask 3.2: Prepare Cost Allocation Model	6	12	30	0	$8,490	$0	**$8,490**
Subtask 3.3: Prepare Maximum Allowable Fee Calculation	6	12	20	2	$7,230	$0	**$7,230**
Subtask 3.4: Fee Comparison	4	6	40		$8,190	$0	**$8,190**
Task 4: Prepare Development Impact Fee Program Nexus Study							
Subtask 4.1: Prepare Administrative Draft Report	10	40	10	4	$12,430	$0	**$12,430**
Subtask 4.2: Prepare Public Review Draft Report	5	8	12	2	$5,010	$0	**$5,010**
Subtask 4.3: Prepare Final Report	2	6	6	4	$3,000	$300	**$3,300**
Subtask 4.4: Calculation Spreadsheets and Methodology	1	4	0	0	$1,060	$300	**$1,360**
Task 5: Presentation of Materials	12	14	10	2	$8,070	$0	**$8,070**
TOTAL HOURS	**72**	**172**	**174**	**15**	**$81,515**	**$600**	**$82,115**
Billing Rates	$320	$185	$145	$95			
TOTAL PROJECT COSTS	**$23,040**	**$31,820**	**$25,230**	**$1,425**	**$81,515**	**$600**	**$82,115**

[1] Direct expenses are billed at cost and do not include any overhead.
[2] If Subtask 2.3 is needed, EPS will submit a specific scope of work and budget amendment based on the specific facilities' cost estimates that EPS is charged with preparing.

7. Work Plan and Schedule

Based on an estimated level of effort and the deadlines for milestones contained in the City's RFP, EPS has prepared the a conceptual schedule for the project as shown in **Figure 2**. At the Project Initiation meeting, EPS and the City will discuss the specific deadlines for deliverables and milestones needed to complete the project according to the City's desired schedule.

Figure 2
Folsom Development Impact Fee Nexus Studies
Scope of Work Schedule



APPENDIX A:

KEY STAFF RESUMES

Jamie Gomes

Managing Principal

Education

Master of Business Administration with concentration in Urban Land Development, California State University Sacramento, 1997

Bachelor of Arts in Economics with a minor in History, University of California Davis, 1991

Previous Employment

Senior Loan Officer, First Federal Credit Union, Sacramento, California, 1994–1998

Affiliations

Urban Land Institute (ULI), Sacramento District Council, Treasurer

Growth and Infrastructure Consortium, Member and Presenter

First U.S. Community Credit Union, Sacramento, California, Board of Directors

About

Jamie Gomes has experience consulting in the areas of public finance, fiscal analysis, and real estate economics. Jamie has directed complex consulting assignments on behalf of both public- and private-sector clients that have resulted in successful development and redevelopment projects, and he is one of EPS's leading experts in implementing infrastructure financing mechanisms, particularly Mello-Roos Community Facilities Districts (CFD), development impact fee programs, and fiscal impact analyses.

Selected Projects

Folsom Plan Area Specific Plan—Specific Plan Infrastructure Fee

EPS worked with City of Folsom staff and the Folsom Plan Area Owners' Group to implement a plan area-specific fee program for backbone infrastructure, as well as park and public facility land acquisition. The fee program includes approximately $350 million of roadway, sewer, storm drainage, dry utility, and water infrastructure anticipated to be constructed by property owners in the specific plan area. EPS prepared the original and one subsequent update to the impact fee nexus study. In addition to its work on the nexus studies, EPS is actively engaged by the City of Folsom as a third-party fee program administrator for the Specific Plan Infrastructure Fee.

City of Turlock Master Storm Drainage Development Impact Fee Nexus Study

The City of Turlock engaged EPS to prepare a Nexus Study to document the maximum justifiable Master Storm Development Fees (Storm Drainage Fees) that could be collected from new development. EPS worked with the City and the City's Storm Drain Master Plan consultant to establish projected new land uses, the facilities needed to serve new development, and prepared the Nexus Study document meeting all statutory requirements needed for the fee program update.

Roseville Sierra Vista Specific Plan Fee Program

Working with City of Roseville staff and an engaged property owner stakeholder group, EPS prepared a nexus study to implement development impact fees for new Specific Plan development projects. The Infrastructure component of the fee program funded drainage facilities, including drainage basins and pipes. The fee program includes features to help guide future implementation of the fee program as new Specific Plan development occurs. In addition to its work on the original nexus study and subsequent update, EPS is actively engaged by the City of Roseville as a third-party fee program administrator for the Sierra Vista Specific Plan Fee Program.

Reclamation District No. 784 Drainage Impact Fees

Working on behalf of Reclamation District (RD) 784 located in Yuba County, EPS completed a nexus study updating the RD 784 Drainage Impact Fee Program, which allocated the costs of nearly $40 million in drainage improvements serving new development in three separate drainage basins and two sub-basins.

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916.649.8010 ▪ jgomes@epssac.com ▪ www.epsys.com

Sacramento Comprehensive Development Impact Fee Update

EPS helped the City of Sacramento conduct a comprehensive update of their fee programs calibrated to market and economic limitations. EPS prepared infrastructure cost burden comparisons and development feasibility analysis to identify the capacity for new and increased fees, conducted extensive stakeholder outreach and assisted the City to refine their fee program proposals in response to market and economic limitations.

Northwest Rocklin Annexation Area Public Facilities Financing Plan, CFD Formation, and Finance Plan Administration

EPS prepared a Public Facilities Financing Plan that set forth a strategy to finance backbone infrastructure (including storm drainage improvements) and public facilities needed to serve 1,900 acres in northwest Rocklin. The Plan optimized funding sources that minimize the financial burden on undeveloped land while assuring that necessary facilities will be constructed when needed. Financing Plan implementation included formation of a Mello-Roos CFD and a development impact fee program for infrastructure and public facilities. Finally, EPS has been assisting City of Rocklin staff in implementing property-owner obligations related to the Northwest Rocklin Annexation Area Financing Plan.

Fresno Major Streets, Police, Fire, and Parks Impact Fee Updates

EPS prepared a comprehensive update to the City of Fresno's major streets, police, fire, and public safety impact fees. EPS worked with the City of Fresno and development community stakeholders to define the capital improvement program, develop cost allocation approaches that take into consideration bond-financed facilities and existing deficiencies, as well as other considerations. EPS also prepared a comprehensive comparison of regional infrastructure cost burdens to facilitate calibration of fee program proposals and implementation.

Sacramento Citywide Transportation Development Impact Fee

The City of Sacramento retained EPS to update its Transportation Development Impact Fee (TDIF) Nexus Study. The previous TDIF Nexus Study, completed in 2010, was never adopted by the City Council, and EPS understood the City of Sacramento intended to update the 2010 TDIF Nexus Study to reflect revised improvement costs, land use assumptions, and fee program methodological approaches. Roadway improvements, traffic signals, transit improvements, and bicycle/pedestrian improvements all benefitted new development in the City of Sacramento.

Nevada County Parks and Recreation Facilities Fee Study

The County of Nevada (Nevada County) engaged EPS to prepare an update of its Park and Recreation Facilities Fee Nexus Study for the western portion of unincorporated Nevada County (i.e., west of the Truckee-Donner Parks and Recreation District). With five separate recreation benefit zones, park and recreation services in Western Nevada County are provided by a combination of Nevada County, three separate park districts, and independent recreation service providers for those areas of Nevada County not served by a park district. Complexities related to park and recreation service provision required specialized analysis and outreach to ensure the impact fee appropriately accounted for level-of-service considerations, as well as needed resources, to implement construction.

Elk Grove Roadway and Capital Facilities Fee Programs Update

EPS worked with City of Elk Grove staff and Council and an engaged developer stakeholder group to comprehensively update the city's roadway and capital facilities fee programs. EPS worked with the City of Elk Grove and stakeholder groups to identify facility needs to serve future development, develop future facility cost estimates, and establish a nexus-based fee program to fund those improvements and maintain the desired level of service. The city's Capital Facilities Fee Program included civic center, police, library, corporate yard, and transit facilities components.

Turlock East Tuolumne and Westside Industrial Specific Plan Fee Updates

Working on behalf of the City of Turlock, EPS reviewed engineering cost estimates, allocated the infrastructure costs to new development, estimated a development impact fee based on those costs, and compared those fees with development impact fees from other jurisdictions. This comparative analysis illustrated how the proposed fees could affect the project's competitiveness with other similar types of development projects in the region. EPS assisted the City of Turlock to develop alternative development scenarios and facilities phasing to arrive at a feasible financing strategy. EPS incorporated the fee analysis into a nexus study.

Emilio Balingit

Associate

Education

University of California
Los Angeles Luskin School of Public Affairs, Master of Urban and Regional Planning

University of California
Santa Cruz, Bachelor of Arts in Environmental Studies/Earth Science

Previous Employment

Planner/Associate Planner,
Urban Planning Partners, Inc.,
Oakland, CA,
July 2018–August 2021

Land Development Intern,
California Home Builders,
Canoga Park, CA,
January 2018–June 2018

Bicycle and Pedestrian Projects Intern, San Francisco Municipal Transportation Agency (SFMTA), San Francisco, CA,
June 2017–September 2017

About

Emilio Balingit is a planner with more than 5 years of professional experience in land use planning and policy, California Environmental Quality Act (CEQA), and real estate development in the private, public, and nonprofit sectors. Since joining EPS in 2021, Emilio has provided technical assistance supporting development impact fee administration programs, real estate market analyses, economic development studies, and public facilities financing plans.

Selected Project Experience

Sutter Pointe Specific Plan
Working with Sutter County and a developer group, EPS prepared a public facility financing plan, urban services plan, and fiscal impact analysis for the Sutter Pointe Specific Plan, which plans for more than 17,500 homes and 50 million square feet of commercial space on 7,500 acres. Currently, EPS is supporting implementation of these financing plans by preparing a Sutter Pointe Specific Plan Fee Program Nexus Study and Urban Services Implementation Plan. In addition, EPS is providing technical support to Sutter County to assist with the formation of community facilities districts to fund and construct backbone infrastructure and provide public services in the project area.

Folsom Plan Area Specific Plan Fee Program and Specific Plan Infrastructure Fee
EPS worked with City of Folsom staff and the Folsom Plan Area Owners' Group to implement a plan area-specific fee program for backbone infrastructure, as well as park and public facility land acquisition. The fee program includes roadway, sewer, storm drainage, dry utility, and water infrastructure anticipated to be constructed by property owners in the specific plan area. EPS prepared the original and one subsequent update to the impact fee nexus study. In addition to its work on the nexus studies, EPS is actively engaged by the City of Folsom as a third-party fee program administrator for the Specific Plan Infrastructure Fee.

Upper Westside Specific Plan
EPS is working with Sacramento County and a developer group to develop a public facility financing plan and urban services plan for the Upper Westside Specific Plan, which calls for infrastructure and public facilities to support approximately 9,350 homes and more than 3 million square feet of commercial space in Sacramento County. For the public facilities financing plan, EPS is working with several public agencies to determine the optimal timing of public infrastructure development, ensuring that private development in the Upper Westside area is served by adequate infrastructure and the costs of public infrastructure are shared equally by all development in the plan area.

City of Merced Public Facilities Financing Plan and Impact Fee Update
EPS worked with the City of Merced to provide a comprehensive fee update for infrastructure and public facilities including major roads and bridges, fire, police, and park facilities, and public works infrastructure projects. The updated fee programs are envisioned to contribute over $230 million to new infrastructure and public facilities. Key issues included analyzing the allocation of new public facilities costs between new and existing development and the contribution of non-residential development on roadway demand. EPS's analysis ensured that new development contributes its fair share to new infrastructure and public facilities as the City's population continues to grow.

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APPENDIX B:

WORK SAMPLE:

CITY OF SACRAMENTO DEPARTMENT OF UTILITIES DEVELOPMENT IMPACT FEE PROGRAM AND NEXUS STUDIES

Draft Report

Development Impact Fee Program and Nexus Studies

The Economics of Land Use

Prepared for:
City of Sacramento
Department of Utilities

Prepared by:
Economic & Planning Systems, Inc. (EPS)

February 13, 2023

EPS #212125

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Table of Contents

Appendices

List of Tables

List of Figures

1. Executive Summary

Introduction and Background

In 2011 and 2019, the City of Sacramento (City) Department of Utilities (DOU) prepared Development Impact Fee (DIF) programs using consultants Wildan Financial Services and NBS, respectively. These programs addressed methodologies, costs, maximum justifiable fees, and legal compliance to serve new development in each of the four utility systems administered by DOU: Water, Separated Sewer, Combined Sewer, and Storm Drainage. For a variety of reasons, these efforts were not implemented. In 2022, DOU engaged Economic & Planning Systems, Inc. (EPS) to refresh these efforts in their entirety.

Establishing impact fees requires the identification of the proportional share of improvement costs for current and future customers for existing and planned capital improvements. This measurement of equity, followed with the implementation of the maximum justifiable fees, assures that rate payers do not subsidize new growth and vice versa. With these basic considerations, discussed in general below and in detail in later chapters and supporting appendices, are the data elements, methodologies, and considerations used to determine proportional shares, funding requirements, and impact fees for each of the four utility systems. Accompanying each section is the required structure and focus of a Nexus Study under the State of California's Mitigation Fee Act (CA Government Code Section 66000 and following), which prescribes the means by which public agencies may impose and adopt development impact fees.

The remainder of this section covers the following topics:

- 2040 General Plan Linkage
- Impact Fee Methodology, Types, and Limits
- Infrastructure Needs, Facility Standards, Level of Service, and Deficiencies
- Standard Cost Adjustment Methodology
- Systemwide versus Special Benefit
- Nexus Requirements
- Summary of Findings
- Organization of the Report

This section will be followed by chapters for each utility system.

2040 General Plan Linkage

The current timing of the DIF effort coincides with that of the City's 2040 General Plan Update. The parcel-specific Housing and Employment projections through the 2040 planning horizon are used to establish the likely demand for utility services for this period. Importantly, projected development in the 2040 General Plan is for the period 2016-2040 for employment and 2017-2040 for housing. This report adjusts these projections by accounting for development that has occurred through April 2022 as evidenced by completed building permits. The projections in this study are for the period 2022-2040 or 2023-2040, depending on what is being projected. Also of note is that the Water Master Plan, currently in process by DOU, draws on the same 2040 Master Plan Update projections.

The projections of new and existing demand vary by the geographic area served by each system and, in the Separated Sewer System and the Storm Drainage System, by each subbasin. Only the Water System is citywide. The citywide Housing and Employment projections used in this report are as shown on **Table 1-1**.

Table 1-1. Housing by Type and Employment

		2040 General Plan		
	2017 American Community Survey	As of April 2022	General Plan 2040 Net New Growth	2040 Totals
Units				
Single Family Detached	117,570	118,670	11,900	130,570
Single Family Attached	12,900	13,300	8,700	22,100
Multifamily	64,300	70,600	40,600	111,200
Total Housing Units	**194,800**	**202,570**	**61,200**	**263,870**

Employment	2015 Estimated	As of April 2022	2040 New Employment	2040 Totals
City of Sacramento	**300,067**	**307,019**	**69,660**	**376,679**

Sources: City of Sacramento Community Development Department and EPS Exec_1

Importantly, much of the new development is projected for parcels with existing development. These parcels will be developed more intensively. Any reductions in employment or housing caused by this intensification are deducted from the protected growth. The projection is net growth.

The projections for each utility system and basin are provided in each relevant section and in the appendices of this report.

Housing by type and employment by standard industry classifications (SICs)[1] are used to estimate water demand and sewer and drainage capacity requirements. Housing type and employment by the SICs are associated with land use types. For nonresidential properties, employment by land use establishes a square footage requirement for new employees. The conversion factors are included as **Appendix A-1**. With square footage values and housing unit data associated with land use types, there are standard and customary measures of demand by land use for all utility systems in this report. Also, the location data in the General Plan projection is an important determinant of demand. Location determines the service received, as well as basin location and parcel size, all of which are important drivers of demand. All of these demand indicators for each service are as shown on **Table 1-2**.

Table 1-2. 2040 General Plan Projection Data and Utility Demand Indicator

Utility System	2040 General Plan Projection	Demand Indicator
Water	Housing Units and Commercial Square Feet by Land-Use Type	Equivalent Meter (EM)
Separated Sewer	Basin, Housing Units and Commercial Square Feet by Land-Use Type	Equivalent Standard Dwelling (ESD)
Combined Sewer (Sewer)	Housing Units and Commercial Square Feet by Land-Use Type	Equivalent Standard Dwelling (ESD)
Combined Sewer (Drainage)	Parcel Size, Housing Units and Commercial Square Feet	New Impermeable Square Feet
Storm Drainage	Basin, Parcel Size, Housing Units and Commercial Square Feet	New Impermeable Square Feet

Sources: DOU, City of Sacramento Community Development Department and EPS *Exec_2*

Each demand indicator has demand factors that adjust by the expected capacity requirement of a land-use type or by the measured new impermeable surface. In the Water System, the Separated Sewer System, and the sewer service of the Combined Sewer System, the factors used (EMs and ESDs) adjust by land use from a base of 1 for the typical requirements of single-family detached dwellings for the service received. The Storm Drainage System and the drainage aspect of the Combined Sewer System use new impermeable surface as the demand indicator. The impermeable surface demand indicator is always site-specific to actual, measured new impermeable surfaces. An illustration of the demand indicators with examples of some of the associated demand factors is shown in **Table 1-3**.

[1] North American Industry Classification System, OMB 2022.

Table 1-3. Demand Indicators and Factors by Utility System

Utility System	Demand Indicator	Demand Factors: Single Family Detached Dwelling	Demand Factors: 10,000 Square Foot Office
Water	EM	1	3.2
Separated Sewer	ESD	1	3.3
Combined Sewer (Sewer)	ESD	1	3.3
Combined Sewer (Drainage)	New Impermeable Surface	Site Specific	Site Specific
Storm Drainage	New Impermeable Surface	Site Specific	Site Specific

Sources: DOU and EPS *Exec_3*

All of the demand factors for all land uses are discussed for each utility in the chapters that follow.

In general, all of the demand factors, applied to all current and future land uses, measure the existing and future capacity requirements of all systems. These requirements are shared between current and future development in proportion to the demands placed by current and future development.

Impact Fee Methodology, Types, and Limits

The Buy-In and Incremental Approaches

Improvement costs for which a proportionate share can be determined include both existing and future improvements. A new water connection, for example, is benefitting from all of the past investment made by existing rate payers to acquire, produce, and deliver water. The current value of those assets is an investment value, or cost, in which new development should participate. A future improvement to increase water production capacity would be a responsibility of new growth if that capacity is not also required to improve an existing capacity deficiency, in which case, a shared responsibility would be required.

The two types of improvement costs and the proportional share considerations they involve describe two different impact fee methodologies: the Buy-In approach and the Incremental Cost approach. **The Buy-In approach** determines the value of current assets and allocates on a reasonable-relationship basis a

proportionate share of the assets new growth will use. For example, the basis used in this report for the Water System is the total future water Equivalent Meters, which vary by land use as a size difference and is a reasonable measure of the demand requirement. The new growth percentage share of those meters by land use is the allocation mechanism for sharing existing facility costs.

The Incremental approach determines the planned infrastructure costs necessary to provide adequate levels and standards of service to current and new customers. Proportionate shares are typically an engineering determination of who benefits. These shares can be determined by the percentage approach used in the Buy-In approach, if that is reasonable. This, in fact, is the approach used in some of the future capital projects in the Water System. Other projects are assigned a specific percentage based on project-specific benefit. The Water System model allocates some of its projects in this manner. The Separated and the Combined Sewer Systems allocate all future capital projects directly to new growth because the identified projects are required to create the storage capacity necessary to accommodate new growth.

A simple matrix of the impact fee methodologies used in this report is shown on **Table 1-4**.

Table 1-4. Impact Fee Methodology by Utility System

Utility System	Methodologies	
Water	Buy In	Incremental
Separated Sewer	-	Incremental
Combined Sewer (Sewer)	-	Incremental
Combined Sewer (Drainage)	-	Incremental
Storm Drainage	Buy In	-

Source: EPS *Exec_4*

The Limits of Impact Fee Methodologies and the Need for Regular Updates

The methodology used, whether the Buy-In approach, the Incremental approach, or a combination (known as **the Combined approach**) is determined by data availability, feasibility, and management discretion. These factors define the scope, type, and limits of the impact fee methodology. There are, for example, substantial existing assets in the Combined Sewer System with significant current value. However, a Buy-In approach is not being used because of the difficultly in valuing these assets or their replacement cost. Some of the assets are more than 100 years old. The service area is also highly developed with complex underground infrastructure that is not always well documented. As a result, actual

replacement costs on a systemwide basis cannot be reasonably estimated. In this circumstance, the existing Combined Sewer assets are improved through projects on an as-needed basis with other funding means, including with development or other agreements, bond financing, revolving funds, lines of credit, or other rate-based funding.

The limitations imposed by the condition and amount of information regarding existing infrastructure largely determine the methodologies that can be used. These considerations are just one element in the careful construction of a development impact fee program, which requires scrupulous attention to the substantive and procedural requirements of the Mitigation Fee Act.

Methodologies are also limited by constantly changing circumstances in actual growth, cost inflation, and other changes. Impact fees are calculated assuming a level of demand growth that almost always will be different than that projected. As discussed further below, the infrastructure costs in this report are based on January 2022 dollars, which will automatically adjust annually on an index basis. However, that mechanism is rarely adequate in matching actual costs, which cannot be known with precision without actual construction. Indexes are also lagging indicators, whereas construction contracts are real-time. For these and other reasons, actual costs rarely match predicted costs. Finally, the need for a project can change as service priorities and technologies adapt. The reality of these circumstances underscores the importance of regular updates that account for actual project costs and reassess planned projects, growth demands, and readjusts impact fees as appropriate. State law requires updates every 8 years. The complexity and issues involved in the impact fee programs in this report may indicate updates on a much more frequent basis.

Infrastructure Needs, Facility Standards, Level of Service, and Deficiencies

All infrastructure in this report is identified and prioritized under operating standards that take one, or both, of two forms: "standards of service" or "level of service". Standards of service refer to adopted policies in law or professional practice that are either in place for a particular service or are intended to be. Level of service refers to the actual service benefits in place. When the benefits received are less than the standards of service, a deficiency exists.

As mentioned above, new development cannot be required to fund deficiencies for existing customers. However, deficiencies in facilities that serve both new and existing customers can be split on a proportional share basis. In these instances, the level of service is, and must be, improved for all customers.

In most instances in this report the planned capital projects have been identified either to maintain existing levels of service as growth occurs or to not perpetuate deficiencies. Utility services are unique in that new customers create a direct, immediate impact on the capacity requirements of the service being provided. There must be sufficient capacity in these systems to provide a consistent level of service for all customers at the appropriate service standard. All projects on which impact fees are calculated in this report are designed to address deficiencies or capacity improvements that are shared or new capacity exclusively for new development.

Standard Cost Adjustment Methodology

Throughout this report, dollar values are stated in January 2022 dollars for all existing system assets values, for all estimates of future capital costs, and for all fee calculations. The adjustment methodology is a simple average of two widely used Construction Cost Indexes (CCIs) published by the Engineering News-Record (ENR):

- ENR-CCI for San Francisco as of January.
- ENR-CCI 20 California Cities Average as of January.

The use of this method dampens price spikes in any one city, although San Francisco is given more weight because its economics have a significant influence on the City due to its size and proximity.

Annual Adjustment

Any adopted development impact fees will adjust annually on July 1 in accordance with the methodology.

Systemwide Versus Special Benefit

Whether directed at existing deficiencies or capacity improvements for new development, all projects in this report also create systemwide capacities. Specific development projects required to extend water distribution lines or sewer collection lines or to install self-contained drainage systems are required to self-fund these improvements.

Nexus Requirements

The purpose of a Nexus Study is to establish the legally required nexus (or reasonable relationship) between projected new residential and nonresidential development in the City through General Plan buildout and the capital facilities that will be required to serve that new development.

The nexus requirements for imposing development impact fees were established under Assembly Bill (AB) 1600 legislation, as codified by the Mitigation Fee Act (the Act; California Government Code section 66000 and following). The Act sets forth the procedural requirements for establishing and collecting development impact fees. These procedures require that "the impact fee advances a legitimate state interest, that a proper nexus between the impacts caused by the development and the condition which advances the governmental interest has been demonstrated".[2]

Section 66001 of the Act specifies:

(a) In any action establishing, increasing, or imposing a fee as a condition of approval of a development project by a local agency, the local agency shall do all of the following:

(1) Identify the purpose of the fee.

(2) Identify the use to which the fee is to be put. If the use is financing public facilities, the facilities shall be identified. That identification may, but need not, be made by reference to a capital improvement plan as specified in Section 65403 or 66002, may be made in applicable general or specific plan requirements, or may be made in other public documents that identify the public facilities for which the fee is charged.

(3) Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed.

(4) Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed.

(b) In any action imposing a fee as a condition of approval of a development project by a local agency, the local agency shall determine how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of the public facility attributable to the development on which the fee is imposed.

Important for water and sewer impact fees, Section 66013 of the Act applies the principles of Section 66001 to water and sewer connection fees. Section 66013(a) states, in part, "when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed." The Nexus Study sections in the Water, Separated Sewer, and

[2] A Short Overview of Development Impact Fees, League of California Cities, 2003.

Combined Sewer chapters will address the nexus requirements in Section 66013 terms.

In addition, in 2021, AB 602 amended the requirements for drainage services by creating a "standards and practices" section to the Act, codified as Government Code Section 66016.5. This provision is both declaratory of previously existing law and added certain new requirements. A new provision that pertains to this report requires that a nexus study "shall calculate a fee imposed on a housing development project proportionately to the square footage of proposed units of the development" [66016.5(a)(5)(A)], and "large jurisdictions shall adopt a capital improvement plan as a part of the nexus study" [66016.5(a)(6)].

Water and sewer systems are specifically exempt from the requirements of Section 66016.5. Storm drainage, however, is subject to the provisions but may exercise an exemption to the square footage allocation method if the nexus study makes findings that include all of these:

- An explanation as to why square footage is not an appropriate metric to calculate fees imposed on a housing development project.
- An explanation that an alternative basis of calculating the fee bears a reasonable relationship between the fee charged and the burden posed by the development.
- That other policies in the fee structure support smaller developments, or otherwise ensure that smaller developments are not charged disproportionate fees.

The nexus findings of the Storm Drainage chapter will include these exemption requirements for the Storm Drainage System and the drainage portion of the Combined Sewer System. In both cases, the standard and customary method to establish a reasonable relationship between the fee and the burden to development is focused on impermeable surfaces. This allocation methodology supports equity among development of any size, density and land use.

Summary of Findings

Presented below are high-level comparative summaries of all proposed fees and the fees of surrounding jurisdictions for single-family, retail, and office land uses on a per unit and per acre basis. For the per unit comparison, single-family dwellings are presented on **Table 1-5a**, Retail land uses on **Table 1-5b**, and Office land uses on **Table 1-5c**. For the per acre comparisons, single-family dwellings are presented on **Table 1-6a**, Retail land uses on **Table 1-6b**, and Office land uses on **Table 1-6c**. Companion charts to these tables are provided in **Appendix A-2**. For each utility, all land uses and all fees are discussed in the chapters that follow, along with comparisons with surrounding jurisdictions.

Table 1-5. Summary of Water, Sewer, and Storm Drainage Development Impact Fees per Unit—Single-Family, Retail, and Office

Table 1-5a - Single Family

Per Unit Fees	Single Family Fees per Dwelling Unit				
Jurisdiction	Water	Local Sewer	Regional Sewer	Drainage	**Totals**
Sacramento - Combined Sewer System [1]	$13,493	$7,635	$6,479	-	$27,607
Sacramento - Separated Sewer and Gravity Drainage	$13,493	$3,565	$6,479	$530	$24,067
Sacramento - Separated Sewer and Pumped Drainage	$13,493	$3,565	$6,479	$847	$24,384
Sacramento - SASD and Gravity Drainage	$13,493	$3,194	$6,479	$530	$23,696
Sacramento - SASD and Pumped Drainage	$13,493	$3,194	$6,479	$847	$24,013
Sacramento - All Areas Average [2]	**$13,493**	**$4,231**	**$6,479**	**$688**	**$24,753**
Sacramento County - Uninc.	$19,535	$3,194	$6,479	$2,994	$32,202
Folsom	$4,647	$1,073	$6,479	$1,037	$13,236
Roseville	$7,366	$447	$9,664	$279	$17,756
West Sacramento	$18,006	$7,011	$6,479	$6,185	$37,681
Woodland	$5,770	$7,125	-	$1,362	$14,257
Average Excluding Sacramento [2]	**$11,065**	**$3,770**	**$7,275**	**$2,371**	**$23,026**
Sacramento +/- Percent of Comparative Entities	**22%**	**12%**	**-11%**	**-71%**	**8%**

Source: EPS Exec_5a

Notes:
[1] Includes Drainage under Local Sewer.
[2] Averages exclude cities where the services are not provided.

Table 1-5b - Retail

Per Unit Fees	Retail Fees per 1,000 Building Square Feet [1]				
Jurisdiction	Water	Local Sewer	Regional Sewer	Drainage	**Totals**
Sacramento - Combined Sewer System [2]	$7,930	$4,047	$1,296	-	$13,272
Sacramento - Separated Sewer and Gravity Drainage	$7,930	$1,889	$1,296	$543	$11,658
Sacramento - Separated Sewer and Pumped Drainage	$7,930	$1,889	$1,296	$867	$11,982
Sacramento - SASD and Gravity Drainage	$7,930	$2,053	$1,296	$543	$11,821
Sacramento - SASD and Pumped Drainage	$7,930	$2,053	$1,296	$867	$12,146
Sacramento - All Areas Average [3]	**$7,930**	**$2,386**	**$1,296**	**$705**	**$12,176**
Sacramento County - Uninc.	$16,394	$2,053	$1,296	$2,465	$22,209
Folsom	$5,190	$316	$1,296	$579	$7,380
Roseville	$11,302	$149	$3,221	$303	$14,975
West Sacramento	$11,545	$2,078	$1,296	$5,446	$20,365
Woodland	$3,391	$2,908	-	$1,400	$7,699
Average Excluding Sacramento [3]	**$9,564**	**$1,501**	**$1,777**	**$2,039**	**$14,525**
Sacramento +/- Percent of Comparative Entities	**-17%**	**59%**	**-27%**	**-65%**	**-16%**

Source: EPS Exec_5b

Notes:
[1] Most juridictions assess fees on demand volume for each particular site and land use. The square-footage basis used for Retail and Office uses is for comparative purposes only for all fees across all jurisdictions and is based on a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25) for Retail and 35 percent for Office.
[2] Includes Drainage under Local Sewer.
[3] Averages exclude cities where the services are not provided.

Table 1-5c - Office

Per Unit Fees	Office Fees per 1,000 Building Square Feet [1]				
Jurisdiction	Water	Local Sewer	Regional Sewer	Drainage	**Totals**
Sacramento - Combined Sewer System [2]	$5,664	$2,520	$1,296	-	$9,480
Sacramento - Separated Sewer and Gravity Drainage	$5,664	$1,176	$1,296	$361	$8,497
Sacramento - Separated Sewer and Pumped Drainage	$5,664	$1,176	$1,296	$576	$8,712
Sacramento - SASD and Gravity Drainage	$5,664	$1,467	$1,296	$361	$8,787
Sacramento - SASD and Pumped Drainage	$5,664	$1,467	$1,296	$576	$9,003
Sacramento - All Areas Average [3]	**$5,664**	**$1,561**	**$1,296**	**$468**	**$8,896**
Sacramento County - Uninc.	$11,710	$1,467	$1,296	$1,761	$16,233
Folsom	$3,707	$226	$1,296	$413	$5,642
Roseville	$8,073	$149	$3,221	$216	$11,659
West Sacramento	$8,246	$2,078	$1,296	$3,611	$15,232
Woodland	$2,422	$1,744	-	$1,000	$5,166
Average Excluding Sacramento [3]	**$6,832**	**$1,133**	**$1,777**	**$1,400**	**$10,786**
Sacramento +/- Percent of Comparative Entities	**-17%**	**38%**	**-27%**	**-67%**	**-18%**

Source: EPS Exec_5c

Notes:
[1] Most juridictions assess fees on demand volume for each particular site and land use. The square-footage basis used for Retail and Office uses is for comparative purposes only for all fees across all jurisdictions and is based on a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25) for Retail and 35 percent for Office.
[2] Includes Drainage under Local Sewer.
[3] Averages exclude cities where the services are not provided.

Table 1-6. Summary of Water, Sewer, and Storm Drainage Development Impact Fees per Acre—Single-Family, Retail, and Office

Table 1-6a - Single Family

Per Acre Fees	Single Family Fees at 7 Units per Acre				
Jurisdiction	Water	Local Sewer	Regional Sewer	Drainage	**Totals**
Sacramento - Combined Sewer System [1]	$94,450	$53,448	$45,353	-	$193,251
Sacramento - Separated Sewer and Gravity Drainage	$94,450	$24,954	$45,353	$3,508	$168,265
Sacramento - Separated Sewer and Pumped Drainage	$94,450	$24,954	$45,353	$5,725	$170,482
Sacramento - SASD and Gravity Drainage	$94,450	$22,360	$45,353	$3,508	$165,671
Sacramento - SASD and Pumped Drainage	$94,450	$22,360	$45,353	$5,725	$167,889
Sacramento - All Areas Average [2]	**$94,450**	**$29,615**	**$45,353**	**$4,616**	**$173,112**
Sacramento County - Uninc.	$136,745	$22,360	$45,353	$20,959	$225,417
Folsom	$32,529	$7,511	$45,353	$7,259	$92,652
Roseville	$51,561	$3,129	$67,648	$1,953	$124,291
West Sacramento	$126,042	$49,077	$45,353	$43,294	$263,766
Woodland	$40,390	$49,875	-	$9,531	$99,796
Average Excluding Sacramento [2]	**$77,453**	**$26,390**	**$50,927**	**$16,599**	**$161,184**
Sacramento +/- Percent of Comparative Entities	**22%**	**12%**	**-11%**	**-72%**	**7%**

Source: EPS Exec_6a

Notes:
[1] Includes Drainage under Local Sewer.
[2] Averages exclude cities where the services are not provided.

Table 1-6b - Retail

Per Acre Fees	Retail Fees per Acre [1]				
Jurisdiction	Water	Local Sewer	Regional Sewer	Drainage	**Totals**
Sacramento - Combined Sewer System [2]	$86,355	$44,069	$14,111	-	$144,535
Sacramento - Separated Sewer and Gravity Drainage	$86,355	$20,575	$14,111	$5,586	$126,628
Sacramento - Separated Sewer and Pumped Drainage	$86,355	$20,575	$14,111	$9,118	$130,159
Sacramento - SASD and Gravity Drainage	$86,355	$22,360	$14,111	$5,586	$128,412
Sacramento - SASD and Pumped Drainage	$86,355	$22,360	$14,111	$9,118	$131,944
Sacramento - All Areas Average [3]	**$86,355**	**$25,988**	**$14,111**	**$7,352**	**$132,336**
Sacramento County - Uninc.	$178,536	$22,360	$14,111	$26,844	$241,851
Folsom	$56,516	$3,438	$14,111	$6,302	$80,367
Roseville	$123,077	$1,623	$35,080	$3,298	$163,078
West Sacramento	$125,723	$22,629	$14,111	$59,309	$221,773
Woodland	$36,926	$31,668	-	$15,248	$83,842
Average Excluding Sacramento [3]	**$104,156**	**$16,344**	**$19,354**	**$22,200**	**$158,182**
Sacramento +/- Percent of Comparative Entities	**-17%**	**59%**	**-27%**	**-67%**	**-16%**

Source: EPS Exec_6b

Notes:

[1] Most juridictions assess fees on demand volume for each particular site and land use. The acreage basis is for comparative purposes only for all fees across all jurisdictions and is based on a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25).

[2] Includes Drainage under Local Sewer.

[3] Averages exclude cities where the services are not provided.

Table 1-6c - Office

Per Acre Fees	Office Fees per Acre [1]				
Jurisdiction	Water	Local Sewer	Regional Sewer	Drainage	**Totals**
Sacramento - Combined Sewer System [2]	$86,355	$38,415	$19,756	-	$144,525
Sacramento - Separated Sewer and Gravity Drainage	$86,355	$17,935	$19,756	$5,197	$129,243
Sacramento - Separated Sewer and Pumped Drainage	$86,355	$17,935	$19,756	$8,482	$132,527
Sacramento - SASD and Gravity Drainage	$86,355	$22,360	$19,756	$5,197	$133,667
Sacramento - SASD and Pumped Drainage	$86,355	$22,360	$19,756	$8,482	$136,952
Sacramento - All Areas Average [3]	**$86,355**	**$23,801**	**$19,756**	**$6,839**	**$135,383**
Sacramento County - Uninc.	$178,536	$22,360	$19,756	$26,844	$247,496
Folsom	$56,516	$3,438	$19,756	$6,302	$86,012
Roseville	$123,077	$2,272	$49,112	$3,298	$177,759
West Sacramento	$125,723	$31,681	$19,756	$55,061	$232,220
Woodland	$36,926	$26,589	-	$15,248	$78,763
Average Excluding Sacramento [3]	**$104,156**	**$17,268**	**$27,095**	**$21,351**	**$164,450**
Sacramento +/- Percent of Comparative Entities	**-17%**	**38%**	**-27%**	**-68%**	**-18%**

Source: EPS Exec_6c

Notes:

[1] Most juridictions assess fees on demand volume for each particular site and land use. The acreage basis is for comparative purposes only for all fees across all jurisdictions and is based on a 1-acre parcel with a structure covering 35 percent of the parcel (i.e., a F.A.R of .35).

[2] Includes Drainage under Local Sewer.

[3] Averages exclude cities where the services are not provided.

There are many features to these comparisons that will be touched on in the chapters that follow. In the above tables, two points of Sacramento's fee structure stand out in contrast to comparable jurisdictions. Sacramento has extraordinarily high sewer fees in its Combined Sewer System Utility. This is due to the high cost of managing a sewer system that mixes wastewater and stormwater runoff. The other "outlier," in contrast, is the drainage fee set. Drainage fees are very low for reasons to be discussed in the Storm Drainage System Utility chapter. This is in light of the fact that the hydrology of Sacramento is very challenging, complex, and expensive to drain because of the flat, low-lying, delta topography.

Also significant is the comparison set used. The Water System Utility uses a broader set that is likely a fairer comparison for this system. This set is discussed in that chapter.

Organization of Report

This report is divided into 5 chapters and 5 appendices:

- **Chapter 1** includes this Executive Summary.
- **Chapter 2** details the Water System Development Impact Fee, Methodology, and Nexus Findings.
- **Chapter 3** details the Separated Sewer System Development Impact Fee, Methodology, and Nexus Findings.
- **Chapter 4** details the Combined Sewer System Development Impact Fee, Methodology, and Nexus Findings.
- **Chapter 5** details the Storm Drainage System Development Impact Fee, Methodology, and Nexus Findings.
- **Appendix A** provides supporting detail and documentation for the Executive Summary.
- **Appendix B** provides supporting detail and documentation for the Water System Utility.
- **Appendix C** provides supporting detail and documentation for the Separated Sewer System Utility.
- **Appendix D** provides supporting detail and documentation for the Combined Sewer System Utility.
- **Appendix E** provides supporting detail and documentation for the Storm Drainage System Utility.

2. The Water System Utility

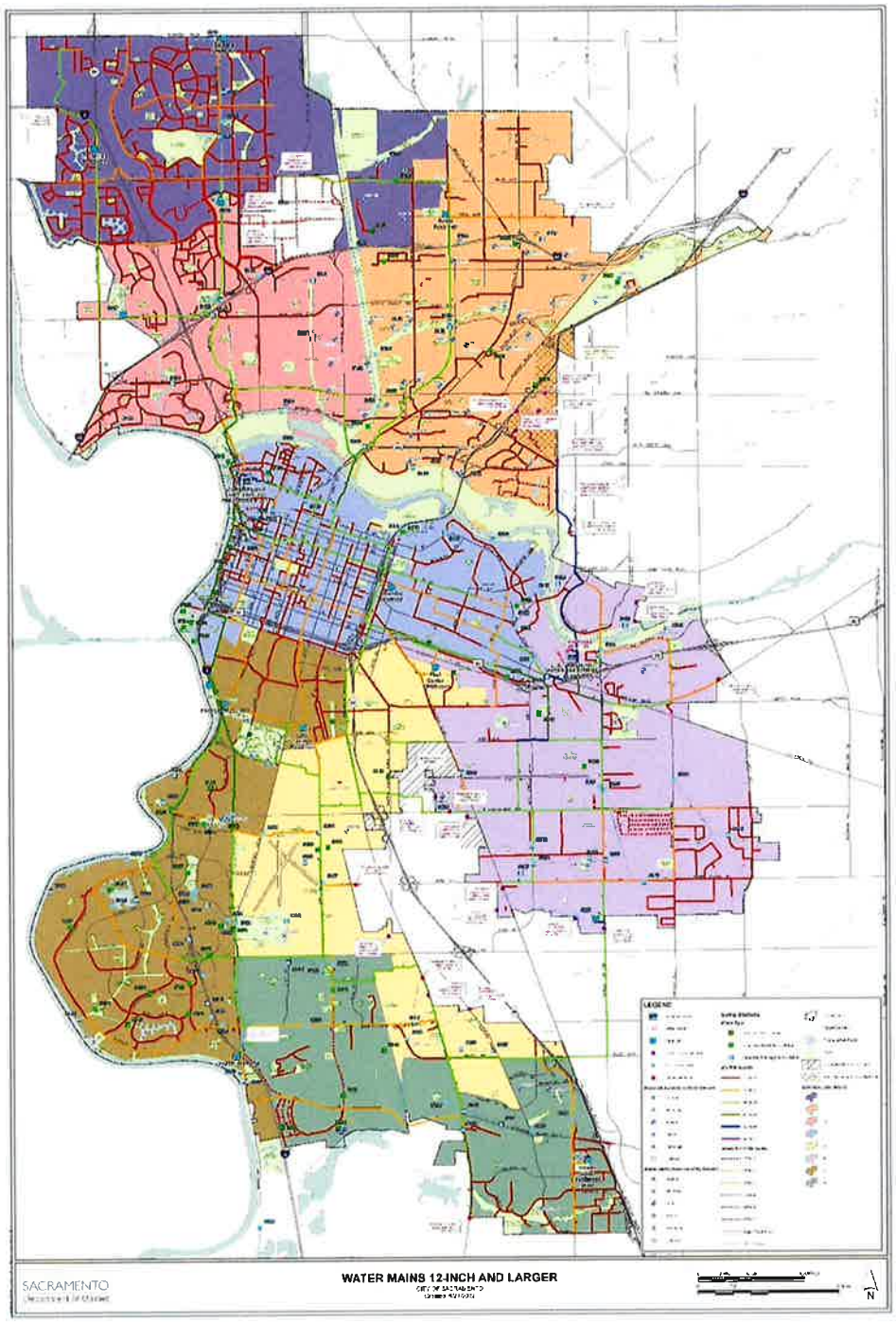
Introduction and Description

The City's Water System is maintained and operated by DOU and implements comprehensive drinking water programs that focus on the supply, production, storage, and distribution of high-quality drinking water; on system maintenance and improvements; and on water conservation. The Water System produces more than 25 billion gallons of drinking water annually acquired through the 25,000-square-mile watersheds of the American and Sacramento Rivers. DOU maintains 2 water treatment plants, 28 active ground water wells, storage facilities, and more than 1,500 miles of water mains. DOU operates under legal and policy mandates to ensure that all delivered water meets or exceeds all state and federal drinking water standards. Also critical in these times of drought is demand management by way of efforts to increase water efficiency throughout the City with education, incentives, resources, and information for home and business owners. Further, detailed information on the Water System is available online at https://www.cityofsacramento.org/Utilities/Water.

The Water System currently serves a resident population of 525,000 in approximately 203,000 housing units. The total population served is estimated to be up to 25 percent higher on weekdays because of commercial and government employment of surrounding-area residents. Total employment is approximately 307,000 in 83 million square feet of space. All water services to this residential and nonresidential population are provided through 142,000 metered accounts.

The Water System service area is generally contiguous with the incorporated boundaries of the City. The map of the service area is shown in **Figure 2-1**.

Figure 2-1. Water System Boundaries and Key System and Geographic Characteristics



Growth, Demand, and Allocations

By 2040, the residential unit growth in the Water System service area is expected to change as shown on **Table 2-1**.

Table 2-1. Housing Units by Type

	2017 American Community Survey	2040 General Plan: As of April 2022	2040 General Plan: General Plan 2040 Net New Growth	2040 Totals [1]	% Change	New Share
Units						
Single Family Detached	117,570	118,670	11,900	130,570	10.03%	9.11%
Single Family Attached	12,900	13,300	8,700	22,100	66.17%	39.37%
Multifamily	64,300	70,600	40,600	111,200	57.51%	36.51%
Total Housing Units	**194,800**	**202,570**	**61,200**	**263,870**	**30.3%**	**23.2%**

Sources: City of Sacramento Community Development Department and EPS *water_1*

Note:
[1] Totals may not add because of rounding.

Housing units are projected to increase by 30.2 percent by 2040. This new growth in housing will constitute 23.2 percent of total housing units by 2040.

Residential unit growth is the best, general driver of demand for water capacity. In a water utility, the capacity requirements are measured in Equivalent Meters (EMs), or similar. EMs are a measure of delivery volume and are indexed to the volume required of a typical single-family detached home. Meter size varies with the required delivery volume for a land use type. The current and future EM requirements are shown on **Table 2-2**.

Table 2-2. Equivalent Meter Projection and new Growth Share

Size *formula*	Current Count *a*	Type	Flow Factor *b*	Equivalent Meters *c = a * b*	Unit Increase Percent *d*	2040 Equivalent Meters *e = c * (d + 1)*	2040 New Equivalent Meters *f = e - c*
5/8-inch	174	*Displacement*	1.0	174	30.3%	227	53
3/4-inch	178	*Displacement*	1.0	178	30.3%	232	54
1-inch	131,511	*Displacement*	1.0	131,511	30.3%	171,308	39,797
1.25-inch	0	*Displacement*	1.5	0	30.3%	0	0
1.5-inch	3,910	*Displacement*	2.0	7,820	30.3%	10,186	2,366
2-inch	4,357	*Displacement*	3.2	13,942	30.3%	18,162	4,219
3-inch	802	*Turbine Class I*	7.0	5,614	30.3%	7,313	1,699
4-inch	698	*Turbine Class I*	12.6	8,795	30.3%	11,456	2,661
6-inch	208	*Turbine Class I*	26.0	5,408	30.3%	7,045	1,637
8-inch	112	*Turbine Class II*	56.0	6,272	30.3%	8,170	1,898
10-inch	18	*Turbine Class II*	84.0	1,512	30.3%	1,970	458
12-inch	0	*Turbine Class II*	106.0	0	30.3%	0	0
Totals	**141,968**		--	**181,226**		**236,067**	**54,841**
					New Growth Share of Total		**23.2%**

Source: DOU, EPS *Water_2*

This demand profile of existing and future housing units drives the allocation of current and future shares of existing and future capacity requirements and their costs. The shares for existing system assets are determined under the Buy-In approach. Future shares are determined through the Incremental approach. These approaches are discussed in detail in the **Executive Summary**. The Water System is using both approaches.

Buy-In Methodology and Fee per Equivalent Meter

The Buy-In approach is used to determine existing asset shares. Existing assets that will benefit future customers (existing treatment plants, wells, and transmission lines) have been paid for by current rate payers. Future customers will "buy in" to 23.2 percent of these assets by way of a buy-in development impact fee. The assets are depreciated and developer contributions are removed so only the remaining useful life of assets directly paid by rates is allocated.

An option exists in the determination of buy-in development impact fees to include current assets that are systemwide benefits and qualify as assets as defined under Generally Accepted Accounting Principles. These are fairly wide-ranging standards and include all buildings, equipment and improvements, land including easements, equipment, core software, rolling stock and related equipment, and even intangible assets such as franchise licenses. This allowable scope extends to all core functions (i.e., treatment plants, wells, and transmission lines) and to peripheral support functions including corporation yards and administration buildings. Although a broader suite of existing improvements would qualify, the approach used in this study is narrower. The assets included are those unambiguously used for water production, storage, and transmission. Not included are any assets that are not directly used for water system purposes, such as administration buildings or corporation yards and related equipment, all of which are indirectly used. Also not included are local distribution lines or service meters because these items benefit individual developments or parcels, instead of the system as a whole.

To value the included water assets, DOU engaged the engineering firms of West Yost and Carollo to provide estimates of value for the treatment plants, storage facilities, and wells under the general guidance established by the Association for Advancement of Cost Engineering (AACE). City staff developed estimates of value for the transmission mains using essentially the same methodology. The detail of all assets and methodologies is provided in **Appendix B-1**.

Other assets included are related to rolling stock and software, both of which have been valued from the City's accounting records.

The summary results of the water system current asset valuation are shown on **Table 2-3**.

Table 2-3. Existing Assets

Summary [1] Category	Replacement Cost	Depreciation	Current System Value
Transmission Mains	$569,160,101	$334,676,965	$234,483,136
Wells [2]	$156,875,500	$141,954,001	$14,921,499
Reservoirs	$361,600,000	$234,500,000	$127,100,000
Treatment Plants			
Sacramento River	$1,218,300,000	$468,000,000	$750,300,000
E. A. Fairbairn	$1,079,100,000	$597,100,000	$482,000,000
Software	$3,491,478	$1,088,462	$2,403,016
Vehicles	$10,102,308	$5,444,536	$4,657,772
		Subtotal	$1,615,865,423
Less Outstanding Principal Debt			($232,147,747)
Less Developer Contributions			($2,972,534)
Totals	**$3,398,629,387**	**$1,782,763,964**	**$1,380,745,142**

Sources: Carollo, West Yost, DOU, City of Sacramento *Water_3*

Note:

[1] The full detail of the estimates and methodologies are provided in Appendix B-1.

[2] The total Current System Value excludes Wells 165, 166 and 167 on the West Yost valuation analysis because these wells are not in service.

Each component of an asset has been depreciated in accordance with the standard useful life of that component. Treatment plants, for example, have many components with different useful lives. The current value of each component is determined in one of two ways, depending on the circumstances:

- If the original cost and installation date are available, the original cost is depreciated on a straight-line basis for years in service. The remaining value is then adjusted to 2022 dollars using the standard cost adjustment methodology, which is defined in the **Executive Summary** chapter.
- If the original cost is not available but the installation date is known, the replacement cost is estimated in 2022 dollars using the AACE protocols. This value is then depreciated for years in service.

In either case of valuing, each of the components are accumulated into the summaries shown in **Table 2-3**. Detailed depreciation of the assets and the component depreciation standards can be found in **Appendix B-1**.

Also, outstanding principal debt has been included as a deduction to asset value because the underlying assets are in service but have not been paid for by current rate payers. All existing and future customers will pay for these debt-financed assets through future rates. Deductions are also made for developer contributions

because these assets were not directly funded by rate payers through rates. The asset values for developer contributions have been depreciated for time in service.

The fee per EM calculation for the proportional share for new growth is shown in **Table 2-4**.

Table 2-4. Equivalent Meter Buy-In Fee

	Current System
2022 Value	$1,380,745,142
New Growth Share %	23.20%
New Growth Share	$320,332,873
Future Equivalent Meters	54,841
Fee per Equivalent Meter	**$5,841**

Source: DOU, EPS *Water_4*

The fee will be used for a proportional share of capital improvements benefitting new growth. The projects and the process by which they are established is described in the next section under Capital Improvement Projects (CIPs).

The Buy-In fee is combined with the Incremental Fee, discussed below, for the total base Water System Development Impact Fee per EM. The calculation combining the two fees is shown on **Table 2-8** later in this chapter. The allocation of the combined fee per EM by meter size is presented in **Table 2-9**, also later in this chapter.

Incremental Methodology and Fee per Equivalent Meter

Future asset requirements are allocated through engineering determinations of proportional demands. If an asset has an equal demand from, or benefit to, all users, the allocation percentage for in-common facilities (23.2) is used. If the asset benefits growth more than existing customers, or vice versa, the allocation is adjusted accordingly. The capital improvement plan presented below details future projects and the specific allocation used.

Capital Improvement Program

DOU maintains Capital Improvement Program (CIP) plans for the Water System. The CIP includes projects that are expected to be complete from within the next year to projects expected to be programmed for implementation as far into the future as 30 years. Because the planning horizon for the purpose of this study is

2040, or 18 years, anticipated annual expenditures after this date are not included.

The CIP draws on documents and processes as follows:

- Updated facility plans and the related short-term projects adopted through the annual budget process.
- The Water Supply Master Plan of 2013 and an update currently underway. Both plans are consistent with the demand projections in the 2035 General Plan Update and 2040 General Plan, respectively.
- CIPs and projects to implement the Master Plans and adapt the water system to future demand requirements and best practices.
- Other facility cost estimates and updated assessments of facility needs and costs as of September 2022. Related projects are incorporated into the formal CIP as appropriate.

In all aspects of the CIP planning and implementation process, the City is required by state law to provide safe, clean, affordable, and accessible water. Long-range water demand projections have identified a potential shortage of water treatment capacity within approximately the next 18 years. To prepare for and meet projected demand, the City needs to develop additional capacity, both in terms of quantity and quality.

To achieve the objectives of state law efficiently and effectively, a key methodology used by DOU is the **Water+ Programmatic Approach**. The elements of this program guide the identification of system needs and subsequent actions and projects:

- Align the City's water treatment capacity with the City's continued growth and economic development.
- Protect the City's drinking water against anticipated climate change impacts and other risks.
- Maintain water supply resiliency through conjunctive use of surface and groundwater supplies.
- Expand the community's confidence in its affordable, safe, clean, and reliable drinking water.
- Engage the community in support of long-range planning for drinking water infrastructure.
- Equitably balance funding needs through development impact fees, customer water rates, grants, and loans.

The CIP consists of 21 project types, or cost centers, for multiple individual projects of the same type, and totals $1,922,485,841. All proposed projects, costs, allocations, and descriptions are included in **Appendix B-2**. Major projects are discussed below.

Resiliency Projects, as a category of projects, are increasingly important because of changing regulations, continuing climate change, wildfires in the watershed, river pollution and algal toxins, among other risks impacting the City's ability to reliably deliver high-quality drinking water. Development and implementation of Resiliency Projects will help protect the City's water supply from these risks.

For the purposes of this study, Resiliency Projects address demand common to all customers; thus, costs will be shared proportionately:

- Ozone treatment capability in both water treatment plants to implement available technologies to enhance the capacity to mitigate risks from chemical contaminants, viruses, bacteria, and other microorganisms and to improve taste and smell. Ozone treatment will also provide for compliance with key anticipated future regulations.
- Fairbairn rehabilitation to provide 100 million gallons per day (mgd) firm and 120-mgd hydraulic capacity.
- Replacement of the chlorine gas system with a safer means of chlorine disinfection.
- Replacement of quicklime slaking to a delivered hydrated lime slurry to reduce on-site waste production.
- Elimination of hazardous chlorine gas and lime grit at both water treatment facilities.

All of the Resiliency Projects have a cost of $960,684,609. The proportional share for new growth is 23.2 percent, or $222,878,829

The RiverArc Project is also a Resiliency Project, in a sense, that will provide significantly improved backup and flexibility to water sources available for existing customers, new growth, and to surrounding communities. The project will divert water through an existing water intake structure from the Sacramento River to offset water currently diverted from the American River. Reduction of draws from the American River has been identified as a potential mitigation measure for climate change impacts to water supply in the American River watershed as described in the American River Basin Plan. In 2015 and 2021, Folsom Reservoir levels were very close to not being able to access municipal water supply intakes. The flow of the Sacramento River, which is many times the size of the American River, has the capacity to reduce reliance on the American River. The proposed action will provide 30 mgd of additional water supply capacity to the City. Demand for water from new growth is estimated to require 22 mgd.

In addition, RiverArc will help facilitate the recharge of the groundwater storage basin via "direct" or "in-lieu" recharge in wet years for use in years when surface water supplies are depleted due to drought-like conditions and the water supply demands of the City, the region, and potentially other areas in northern California are strained. On the whole, RiverArc will better secure the ability to accommodate growth in the City and will benefit regional water suppliers, increase the sustainability of regional groundwater supplies, and provide additional environmental protection of the American River Watershed. The flexibility provided by RiverArc could allow for water to be delivered through raw water pipelines to a new regional water treatment plant, where it will be distributed through new and existing pipelines to the regional partners.

The estimated cost of RiverArc is $220,000,000 for an additional 30 million gallons of capacity. All other costs related to regional River Arc partners are excluded from this report because these other costs are not attributable to new growth in the City. The portion attributable to City new growth is 22 million gallons, or 73.33 percent of the 30-million-gallon capacity. The remaining capacity, 8 million gallons, addresses demand common to all customers because of the resiliency benefits. The 8-million-gallon portion will be shared proportionately between existing development and new growth. The calculations of attributable benefits and costs are shown in **Table 2-5**.

Table 2-5. RiverArc Capacity, Benefit, and Cost Allocation

		Capacity Allocation [1]	Proportional Benefit Allocation	Cost
New Growth and Shared Allocation	*formula*			
Capacity and Total Cost	*a*	30.0	100.00%	220,000,000
New Growth	*b = (22 / 30) * a*	22.0	73.33%	161,333,333
Existing Development	-	-	-	-
Shared	*c = (8 / 30) * a*	8.0	26.67%	58,666,667
Shared Allocation				
Shared	*c*	8.0	100.00%	58,666,667
New Growth	*d = c * 23.2*	1.9	23.20%	13,610,667
Existing Development	*e = c - d*	6.1	76.80%	45,056,000
New Growth and Existing Development Allocation				
New Growth	*f = b + d*	23.9	79.52%	**174,944,000**
Existing Development	*g = e*	6.1	20.48%	**45,056,000**
Capacity and Total Cost	*h = f + g = a*	30.0	100.00%	**220,000,000**

Sources: DOU, EPS *Water_5*
Note:
[1] In millions of gallons per day, rounded to the nearest tenth.

The RiverArc project is proposed for completion towards the end of this decade.

An alternative to the RiverArc project, termed the **Sacramento River Water Treatment Plant (SRWTP)**, is under consideration as a substitute for allocation to new growth but is not incorporated in any of the calculations at this time. The capital project summary for the SRWTP alternative is provided in **Appendix B-2**. Although it involves a more complex governance option, RiverArc is the preferred alternative for allocation as it provides a potentially greater global benefit and the potential for reduced initial investment than SRWTP expansion. Essentially, the SRWTP focuses on capacity improvements. These are the major components:

- The development of an additional 75 million gallons per day (mgd) of increased capacity at the SRWTP. The 75 mgd project could be completed as one project or broken into two phases.
- Capacity improvements across the water main transmission system.
- The addition of a new or replacement intake structure within the Sacramento River with a facility to support the additional supply needs.

The total cost is estimated at $493.8 million, with $195.9 million allocable to new growth, compared with the $174.9 million allocable from the RiverArc project. Should the SRWTP become the priority for allocation, the Nexus Study can be amended.

A final category of capital planning and the Water+ Programmatic Approach is improvements to the distribution system at an estimated cost of $740,687,970. These projects are also detailed in **Appendix B-2**. None of these projects are being allocated to the incremental portion of the Water System development impact fee. There are capacity-related projects in the distribution system improvements that could be funded with a proportional share from the Buy-In development impact fee or other sources.

A summary of all CIPs, costs, and proportional shares is shown on **Table 2-6** below.

Table 2-6. CIP Summary of Proportional Allocations and Costs

		Proportional Allocation			
		Percent		Cost	
Projects [1]	**Estimated Cost**	**Existing**	**New**	**Existing**	**New**
formula	*a*	*b*	*c*	*d = a * b*	*e = a * c*
Resiliency [2]	$960,684,609	76.8%	23.2%	$737,805,780	$222,878,829
RiverArc [3]	$220,000,000	20.5%	79.5%	$45,056,000	$174,944,000
Distribution [4]	$740,687,970	100.0%	-	$740,687,970	-
Annual Misc. [5]	$1,113,262	76.8%	23.2%	$854,985	$258,277
Total Long-Term	**$1,922,485,841**	**79.29%**	**20.71%**	**$1,524,404,735**	**$398,081,106**

Sources: DOU, EPS *Water_6*

Notes:
[1] Excludes the Water Meter Program, all of which is allocated to Existing.
[2] See Appendix B-2.
[3] From Table 2.5 and Appendix B-2.
[4] See Appendix B-2.
[5] See Appendix B-2.
[6] Totals may not agree with detailed allocations and numbers due to rounding effects.

Capital Costs, Allocation, and Cost per Equivalent Meter

All CIP Costs, the allocation of these costs to existing and future customers, and the cost per EM is shown in **Table 2-7**.

Table 2-7. Future Demand Shares

		Proportional Allocation			
		Current Development		New Growth	
	Totals	**%**	**$**	**%**	**$**
formula	*a*	*b*	*c = a * b*	*d*	*e = a * d*
Demand Shares					
Future Assets [1]	$1,922,485,841	79.29%	$1,523,549,750	20.71%	$398,081,106
2040 Equivalent Meters [2]	236,067		181,226		54,841
Cost per Equivalent Meter	**$8,144**		**$8,407**		**$7,259**

Sources: DOU, EPS *Water_7*

Notes:
[1] See Table 2-6.
[2] From Table 2-4.

As shown, the cost per EM for future customers is $7,259. The allocation of the per EM fee by meter size is presented in **Table 2-9** on the next page.

Water System Development Impact Fee

The cost and fee for per EM for the benefits of the existing system and the future requirements are shown on **Table 2-8**. Future customers will pay their share through the development impact fee.

Table 2-8. Equivalent Meter Buy-In and Future Cost Allocation

Source:	Current System *Table 2-4*	Future Capital Costs *Table 2-7*	Totals
2022 Value	$1,380,745,142	$1,922,485,841	$3,303,230,982
New Growth Share %	23.20%	20.71%	21.7%
New Growth Share	$320,332,873	$398,081,106	$718,413,979
Future Equivalent Meters	54,841	54,841	54,841
Fee per Equivalent Meter	**$5,841**	**$7,259**	**$13,100**

Source: DOU, EPS *Water_8*

The total fee by meter size is shown on **Table 2-9**.

Table 2-9. Buy-In and Future Cost Fee Schedule for New Development

Size *formula*	Flow Factor *a*	Equivalent Meters *a*	Fee Per Equivalent Meter *c*	Fee Per Meter	
				Base Fee *d = a * c*	w/ Admin *e = d * 1.03*
5/8-inch	1.0	1.0	$13,100	$13,100	$13,493
3/4-inch	1.0	1.0	$13,100	$13,100	$13,493
1-inch	1.0	1.0	$13,100	$13,100	$13,493
1.25-inch	1.5	1.5	$13,100	$19,650	$20,239
1.5-inch	2.0	2.0	$13,100	$26,200	$26,986
2-inch	3.2	3.2	$13,100	$41,920	$43,177
3-inch	7.0	7.0	$13,100	$91,699	$94,450
4-inch	12.6	12.6	$13,100	$165,059	$170,011
6-inch	26.0	26.0	$13,100	$340,598	$350,816
8-inch	56.0	56.0	$13,100	$733,595	$755,603
10-inch	84.0	84.0	$13,100	$1,100,393	$1,133,405
12-inch	106.0	106.0	$13,100	$1,388,591	$1,430,249

Sources: DOU, EPS *Water_9*

Comparison with Surrounding Communities

The comparison of the water fee with surrounding jurisdictions is shown on the following two tables. **Table 2-10** shows comparative information by typical meter size for single-family residential, retail, and office uses. **Table 2-11** includes the single-family land use and office and retail uses on a per 1,000 square foot basis and on a per acre basis. For both tables, complete comparative information in chart form is presented as **Appendix B-3**. High-level summaries for all fees in all jurisdictions, but on a narrower set of comparables for water fees, are presented in **Chapter 1**, the **Executive Summary**.

Table 2-10. Fee Comparisons by Land Use and Meter Size

	Site Specific		
Jurisdiction	Single Family	Retail	Office
Typical:	*1-inch meter*	*2, 2-inch meters*	
Sacramento	**$13,493**	**$86,355**	**$86,355**
Sacramento County - Uninc.	$19,535	$178,536	$178,536
Folsom	$4,647	$56,516	$56,516
Orangevale	$8,813	$58,398	$58,398
Roseville	$7,366	$123,077	$123,077
Rocklin	$19,987	$319,792	$319,792
Lincoln	$17,634	$358,360	$368,501
West Sacramento	$18,006	$125,723	$125,723
Woodland	$5,770	$36,926	$36,926
Stockton	$11,542	$86,939	$86,939
Average Excluding Sacramento	**$12,589**	**$149,363**	**$150,490**
Sacramento +/- Percent [1]	**7%**	**-42%**	**-43%**

Source: EPS *Water_10a*

Note:

[1] Retail and Office uses have similar percent differences because all entities typically use 2, 2-inch meters for these land uses.

Table 2-11. Fee Comparisons by Land Use and Area

Jurisdiction	Site Area			Per Acre		
	Single Family	Retail	Office	Single Family [2]	Retail	Office
	per unit	*per 1,000 sq. ft. [1]*				
Sacramento	**$13,493**	**$7,930**	**$5,664**	**$94,450**	**$86,355**	**$86,355**
Sacramento County - Uninc.	$19,535	$16,394	$11,710	$136,745	$178,536	$178,536
Folsom	$4,647	$5,190	$3,707	$32,529	$56,516	$56,516
Orangevale	$8,813	$5,363	$3,830	$61,691	$58,398	$58,398
Roseville	$7,366	$11,302	$8,073	$51,561	$123,077	$123,077
Rocklin	$19,987	$29,366	$20,975	$139,909	$319,792	$319,792
Lincoln	$17,634	$32,907	$24,170	$123,436	$358,360	$368,501
West Sacramento	$18,006	$11,545	$8,246	$126,042	$125,723	$125,723
Woodland	$5,770	$3,391	$2,422	$40,390	$36,926	$36,926
Stockton	$11,542	$7,983	$5,702	$80,797	$86,939	$86,939
Average Excluding Sacramento	**$12,589**	**$13,716**	**$9,871**	**$88,122**	**$149,363**	**$150,490**
Sacramento +/- Percent [3]	**7%**	**-42%**	**-43%**	**7%**	**-42%**	**-43%**

Source: EPS *Water_10b*

Note:

[1] City of Sacramento's water fee is assessed based on meter size. The Retail and Office fee values listed in this table are for comparative purposes only to allow comparison across all jurisdictions by area for a hypothetical development of a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25) for Retail, and 35 percent for Office. This construct is for comparative purposes only and is used to compare fees of all types across juridictions. This methodology is used in the Executive Summary tables.

[2] Based on 7 units per acre.

[3] Retail and Office uses have similar percent differences because all entities use 2, 2-inch meters for these uses.

The proposed fee in Sacramento is on par with the average for single-family land uses and significantly less for nonresidential land uses.

Nexus Findings

For the Water System Utility, this section addresses the following requirements of the Mitigation Fee Act (California Government Code section 66000 et seq.).

Per California Government Code Section 66001

1. Identify the purpose of the fee.
2. Identify how the fee is to be used.
3. Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed.
4. Determine how a reasonable relationship exists between the need for the facility and the type of development project on which the fee is imposed.
5. Demonstrate a reasonable relationship between the amount of the fee and the cost of the facility or portion of the facility attributable to the development on which the fee is impose.

The Water System Development Impact Fee applies to all development in the service area in proportion to the measured expectation of water flow by land-use type.

1. Purpose of the Fee

The purpose of the Water System Development Impact Fee is to fund capacity improvements to accommodate projected new residential and non-residential development as detailed in **Chapter 2**.

2. Use of Fee

The Water System Development Impact Fee will be used to fund water facilities needed to secure, treat, store and transmit water for demand generated by development in the service area.

3. Reasonable Relationship between Use of Fee and Type of Development on Which the Fee is Imposed

The Water System Development Impact Fee varies by development type based on measured expectation of water demand by development type as measured by delivery volume requirements. This proportional fee will be used to fund capital projects identified in **Chapter 2** and **Appendix B.** All improvements are designed to meet Federal, State and City requirements for standards of service in the most cost-effective manner to accommodate projected new residential and nonresidential development in the service area.

A reasonable relationship therefore exists between the use of the Water System Development Impact Fee and the type of development on which the fee is imposed.

4. Reasonable Relationship between Need for Facility and Type of Project on Which the Fee is Imposed

New residential and nonresidential projects in the service area are required to connect to the City's water system. New residents, employees, and patrons of the new developments will generate demand for increased water supply, treatment, storage and delivery. The water facilities needed to accommodate this demand were determined through the standards and criteria of the City's capital planning process, the **Water+ Programmatic Approach** as described in **Chapter 2**.

A reasonable relationship therefore exists between the need for water facilities and new residential and nonresidential development projects on which the Water System Development Impact Fee is imposed because the portion of water facilities funded by the Water System Development Impact Fee is based on the amount of water demand generated by projected residential and non-residential development.

5. Reasonable Relationship between Amount of Fee and Cost of Facilities or Portion of Facilities Attributed to Development on Which Fee is Imposed

The total cost of water facilities attributable to development and funded by the Water System Development Impact Fee is allocated by development type based on measured expectation of water demand by development type as measured by delivery volume requirements. Requirements are indexed in Equivalent Meters where an Equivalent Meter of one is the volume requirement of a typical single-family home. Higher, typical volume requirements equate to higher expected Equivalent Meter requirements. The Water System Development Impact Fee is based on a per Equivalent Meter basis, so is therefore both proportional to the expected demand and proportional with the cost of required facilities.

A reasonable relationship therefore exists between the amount of the Water System Development Impact Fee and the cost of the water facilities attributed to the residential and nonresidential development on which the fee is imposed because the costs are allocated based on the demand generated by new development for water facilities as measured by the demand generated by each development type.

Per California Government Code Section 66013

1. Subsection (a): *Notwithstanding any other provision of law, when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed, unless a question regarding the amount of the fee or charge imposed in excess of the estimated reasonable cost of providing the services or materials is submitted to, and approved by, a popular vote of two-thirds of those electors voting on the issue.*

Finding on the Base Fee: The capital cost portion of Water System Development Impact Fee (Base Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. Costs are estimated for new and improved facilities necessary to accommodate the demand created by the water requirements from projected new residential and non-residential development. Future, periodic updates to the Water System Development Impact Fee will re-evaluate the costs expended and future needs and costs to ensure that the Base Fee has not and does not exceed the estimated reasonable cost of providing appropriate capital improvement services.

Finding on the Administrative Component: The administrative cost portion of Water System Development Impact Fee (Administration Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. The Administration Fee funds City costs associated with fee program administration and implementation including collection and accounting, annual reporting, capital planning, periodic updates to the Water System Development Impact Fee, and other related costs.

2. Subsection (c): *A local agency receiving payment of a charge as specified in paragraph (3) of subdivision (b) shall deposit it in a separate capital facilities fund with other charges received, and account for the charges in a manner to avoid any commingling with other moneys of the local agency, except for investments, and shall expend those charges solely for the purposes for which the charges were collected. Any interest income earned from the investment of moneys in the capital facilities fund shall be deposited in that fund.*

Finding: The City of Sacramento and the Department of Utilities has the systems in place to ensure compliance with Subsection c in accordance with Generally Accepted Accounting Principles, the Government Accounting Standards Board best practices and Generally Accepted Auditing Standards.

3. Subsection (d): *For a fund established pursuant to subdivision (c), a local agency shall make available to the public, within 180 days after the last day of each fiscal year, the following information for that fiscal year:*
   (1) A description of the charges deposited in the fund.
   (2) The beginning and ending balance of the fund and the interest earned from investment of moneys in the fund.
   (3) The amount of charges collected in that fiscal year.
   (4) An identification of all of the following:
      (A) Each public improvement on which charges were expended and the amount of the expenditure for each improvement, including the percentage of the total cost of the public improvement that was funded with those charges if more than one source of funding was used.
      (B) Each public improvement on which charges were expended that was completed during that fiscal year.
      (C) Each public improvement that is anticipated to be undertaken in the following fiscal year.
   (5) A description of each interfund transfer or loan made from the capital facilities fund. The information provided, in the case of an interfund transfer, shall identify the public improvements on which the transferred moneys are, or will be, expended. The information, in the case of an interfund loan, shall include the date on which the loan will be repaid, and the rate of interest that the fund will receive on the loan.

Finding: The requirements of Subsection d are acknowledged and consistent with existing systems and practices.

3. The Separated Sewer System Utility

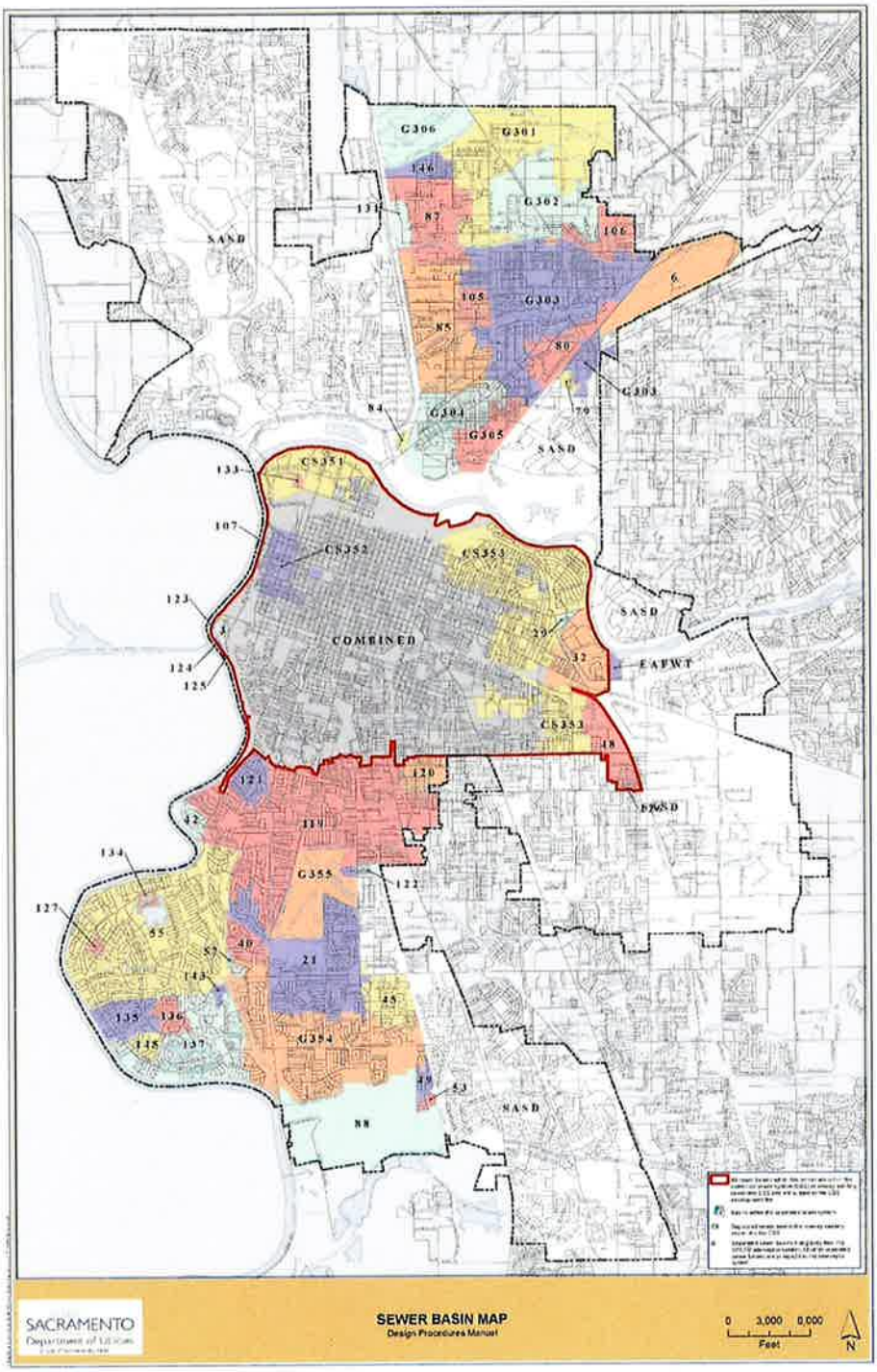
Introduction and Description

The Separated Sewer System (Separated System) provides wastewater services to approximately 50,600 commercial and residential properties located in the City. The Separated System includes approximately 813 miles of pipe and 32 wastewater pump stations in 40 sewer basins. This system is administered by DOU to provide safe and reliable collection and conveyance of wastewater and ensures the wastewater systems comply with all state and federal regulations.

The residential and commercial customers that receive service from the Separated System constitute approximately 33 percent of the total residential and commercial properties in the City. The balance is served by the City's Combined Sewer System or the Sacramento Area Sewer District (SASD), a separate entity not under control of the City. All of the effluent from the City systems and SASD are delivered to a regional treatment facility owned and operated by the Sacramento Regional County Sanitation District.

On the map below (**Figure 3-1**) the boundaries of the Separated System are the basins in color that are outside of the red line encircling the Combined Sewer System (labeled "Combined").

Figure 3-1. Separated Sewer System Utility Boundaries and Key System and Geographic Characteristics



Growth and Demand

For this study, the primary concern for the Separated System is the ability to accommodate growth through capacity improvements required for that growth. The existing system, in contrast, will be maintained and improved by existing rate payers. For new growth, an incremental approach to improvements is appropriate. Capital requirements for new growth are identified through a consistent methodology to evaluate the hydraulic capacity of infrastructure in each basin of the Separated System, termed the **Master Planning Dynamic Model (Dynamic Model)**. This process identifies improvements that will be needed to increase system capacity to accommodate projected sewer flows from new development. The infrastructure is of general benefit, or for use in common, and so excludes local collection lines. Also excluded are developments that are self-funding improvements through Mello-Roos districts or other funding agreements. The infrastructure that remains for this study is in basins without such agreements and includes pipes that serve relatively large tributary areas, manholes along backbone pipes, and pump stations.

The main driver to determine capital requirements is the projected new growth as of 2040 by each basin in the Separated System. The projections by land use are shown on **Table 3-1**.

Table 3-1. 2040 Projected Growth in Land Use

	Residential Units			Commercial and Other Square Feet in Thousands			
Basin	Single Family Detached	Single Family Attached	Multifamily	Food and Retail	Office	Manufacturing and Other	Total Commercial [1]
6	-	-	-	-	-	-	-
21	23	8	29	4	4	12	20
36	2	0	0	0	0	1	1
40	6	0	1	0	0	3	4
42	-	-	-	-	-	-	-
45	15	98	395	8	8	27	43
49	2	0	0	0	0	0	0
53	-	-	-	-	-	-	-
55	91	10	23	15	0	59	74
57	1	0	0	0	0	1	1
79	8	0	2	0	0	4	5
80	37	26	102	6	12	36	54
81	3	0	0	0	0	2	2
84	0	4	17	0	0	3	3
85	735	12	89	11	14	100	125
87	246	34	66	33	18	158	210
105	43	0	0	0	0	0	0
106	174	0	0	1	3	13	17
119	287	75	363	26	12	112	150
120	39	0	2	0	0	7	8
121	20	2	5	4	0	13	17
122	-	-	-	-	-	-	-
127	-	-	-	-	-	-	-
131	23	3	7	1	4	15	19
134	7	0	1	0	0	6	6
135	20	3	6	4	0	15	19
136	-	-	-	-	-	-	-
137	67	6	12	5	16	37	58
143	-	-	-	-	-	-	-
145	-	-	-	-	-	-	-
146	27	4	8	3	4	17	24
G301	380	28	64	80	63	637	780
G302	188	9	27	35	10	172	217
G303	631	108	354	92	44	358	494
G304	53	226	810	61	79	438	578
G305	53	83	312	74	125	211	410
G306	-	-	-	-	-	-	-
G354	279	165	582	25	12	63	99
G355	-	-	-	-	-	-	-
Totals	**3,460**	**904**	**3,277**	**486**	**428**	**2,523**	**3,437**

Sources: City of Sacramento Community Development Department and EPS *Separated_1*

Note:
[1] Totals may not add due to rounding.

There are 29 basins in the Separated System that are projected to have some level of growth and 10 basins that have no projected growth. The calculated fees will apply to all of these basins because actual growth will always vary from projected growth. Growth may occur in any of the basins and may require accommodation.

The common indicator of demand for wastewater services is Equivalent Standard Dwelling (ESD) or equivalent, where an ESD of 1 is the expectation of average sanitary flow from a single-family detached home using average daily winter water-use data. This data is used to factor the ESDs for any land use. The projection of growth for both residential units and nonresidential square feet by land use then determines the ESD demands by basin. In ESD terms, both the existing and new growth demands by basin are shown on **Table 3-2**.

Table 3-2. Existing and Projected Equivalent Standard Dwellings

Basin Number	Existing	Growth 2023-2040	2040 Land Use
6	145	-	145
21	4,326	67	4,393
36	115	2	117
40	553	8	561
42	222	-	222
45	1,437	400	1,837
49	251	2	253
53	175	-	175
55	9,692	144	9,836
57	119	1	120
79	126	11	137
80	2,369	153	2,522
81	29	4	33
84	8	16	24
85	3,750	692	4,442
87	2,614	398	3,012
105	545	100	645
106	787	154	941
119	9,650	642	10,292
120	905	45	950
121	649	42	691
122	110	-	110
127	94	-	94
131	362	36	398
134	153	10	163
135	962	34	996
136	570	-	570
137	4,043	110	4,153
143	103	-	103
145	587	-	587
146	575	45	620
G301	2,431	542	2,973
G302	1,032	436	1,468
G303	7,741	1,162	8,903
G304	2,482	1,006	3,488
G305	1,108	542	1,650
G306	Flood plain (no infrastructure)		-
G354	6,859	1,014	7,873
G355	Executive Airport (county maintained)		-
Totals	**67,681**	**7,818**	**75,499**
Share of 2040 ESDs	**90%**	**10%**	**100%**

Sources: *City of Sacramento DOU and Community Development Department and EPS.* *Separated_2*

Incremental Methodology and Fee per Equivalent Standard Dwelling

As noted above, DOU employs a consistent methodology to evaluate the hydraulic capacity of infrastructure. Both existing and future demand in each basin are evaluated to identify improvements that will be needed to increase system capacity to accommodate both existing and projected sewer flows. Improvements required for either the existing system or new growth can be isolated and identified by basin.

The methodology is maintained through the modelling of existing land uses, projected land uses, peak flows, existing and needed infrastructure, and costs. Recently, the model was refined with the introduction of variations in flows by time of day, along with other variations (e.g., flow regulators, parallel pipes, cycling of pumps, tailwater changes, and other items). The use of this "dynamic" hydraulic modeling allows for an improved alternative analysis to determine the recommended capacity improvements where benefits and costs for each alternative can be evaluated and compared efficiently. The current results of the modelling in terms of improvement costs are depicted on **Table 3-3**.

Table 3-3. System Value and Improvement Costs

Basin	Estimated Existing Value [2]	Improvements Required: To Existing System	Improvements Required: New Growth Only	2040 System Value
formula:	*funding:* *a*	*Existing Rate Payers* *b*	*Future Growth* *c*	*d = a + b + c*
6	$2,788,513	-	-	$2,788,513
21	$110,542,909	-	-	$110,542,909
36	$2,723,943	-	-	$2,723,943
40	$14,969,841	-	-	$14,969,841
42	$8,103,581	-	-	$8,103,581
45	$21,646,974	$1,466,299	$300,867	$23,414,141
49	$5,950,988	-	-	$5,950,988
53	$6,928,764	-	-	$6,928,764
55	$204,051,780	$33,105,049	-	$237,156,829
57	$2,672,238	-	-	$2,672,238
79	$3,287,494	-	-	$3,287,494
80	$20,790,981	-	$4,012,490	$24,803,471
81	$1,080,586	-	-	$1,080,586
84	$2,359,483	-	-	$2,359,483
85	$78,882,442	$5,262,718	$588,644	$84,733,804
87	$45,242,858	$6,150,946	$30,548	$51,424,352
105	$7,644,179	-	-	$7,644,179
106	$18,651,957	$796,891	$237,994	$19,686,842
119	$250,984,661	$12,098,758	-	$263,083,419
120	$16,472,674	-	-	$16,472,674
121	$20,186,677	$1,141,364	-	$21,328,041
122	$3,564,001	-	-	$3,564,001
126	$1,200,980	-	-	$1,200,980
127	$3,360,372	-	-	$3,360,372
131	$3,300,596	-	-	$3,300,596
134	$3,640,660	-	-	$3,640,660
135	$26,203,942	-	-	$26,203,942
136	$15,231,501	-	-	$15,231,501
137	$87,165,355	$1,904,134	$145,815	$89,215,305
143	$2,389,704	-	-	$2,389,704
145	$10,910,560	-	-	$10,910,560
146	$14,242,145	-	-	$14,242,145
G301	$54,405,797	$1,783,252	$11,331,639	$67,520,689
G302	$23,313,834	$7,287,154	$2,978,144	$33,579,132
G303	$169,438,820	$3,463,134	$4,542,548	$177,444,502
G304	$52,967,474	$4,510,374	$1,235,754	$58,713,602
G305	$24,328,171	$498,192	$834,516	$25,660,879
G306	Flood plain (no infrastructure)		-	-
G354	$147,586,496	$7,022,097	$107,903	$154,716,496
G355	Ex. Airport	-	-	-
Totals	**$1,489,213,934**	**$86,490,363**	**$26,346,863**	**$1,602,051,159**

Source: *DOU* Separated_3

Notes:
[1] The main document initiating the methodolgy used is the Technical Memorandum, Department of Utilities, November 18, 2009, included in Appendix C-1.
[2] Estimated replacement value. Does not include depreciation or outstanding debt principal.

Only the New Growth costs, or $26,346,863, are being used to calculate a base fee for new growth. A sample of the improvements and costs for one basin are included as **Appendix C-2**.

The base fee per ESD is shown on **Table 3-4**.

Table 3-4. Improvement Cost per ESD

New Development Cost Allocation	Reference	*formula*	Cost
Improvement Cost to Serve Growth Only	Table 3	*a*	$26,346,863
Improvement Cost per ESD			
New Development ESDs	Table 2	*b*	7,818
Improvement Cost per ESD		*c = a / b*	**$3,370**

Sources: DOU and EPS *Separated_4*

The new growth share of planning costs is calculated on **Table 3-5**.

Table 3-5. Cost per ESD with Planning Costs

Item	Reference	*formula*	Factors
2040 Existing and New ESDs [1]	Table 3-2	*a*	75,499
Master Planning Cost		*b*	$6,850,000
Master Planning Cost per ESD		*c = b / a*	$91
Improvement Cost per ESD	Table 3-4	*d*	$3,370
Total Cost per ESD		***e = c + d***	**$3,461**

Sources: DOU and EPS *Separated_5*

Notes:
[1] Planning costs are spread to all customers. The "non-fee funding requirement" amount is included on Table 3-7.

Planning costs involve ongoing hydraulic capacity analysis of peak flows associated with existing and projected land uses utilizing dynamic modeling approach. Hydraulic model results are utilized to assess alternative capital improvement projects to best address capacity issues for both existing and growth scenarios. Routine updates to flow input data and analysis are also conducted to ensure more accurate costing of capacity improvements to support growth. Planning costs of $6,850,000 are shared by existing and new development at a cost of $91 per ESD. The base and planning fee per ESD for new growth is $3,461.

The schedule of the fee by land use is shown on **Table 3-6**. A further detailed schedule is included as **Appendix C-3**.

Table 3-6. Development Impact Fee Schedule

	ESD	Factor	Cost per ESD	Cost by Land Use and Factor	Administrative Fee (3%)	Fee
Residential						
formula:	*a*		*b*	*c = a * b*	*d = c * .03*	*e = c + d*
Single Family Dwelling	1.00	per dwelling	$3,461	$3,461	$104	$3,565
Apartment	0.66	per dwelling	$3,461	$2,284	$69	$2,353
Hotel/Motel	0.43	per room	$3,461	$1,488	$45	$1,533
Duplex	0.83	per dwelling	$3,461	$2,873	$86	$2,959
College Dorm or Boarding House	0.4	per bed or resident	$3,461	$1,384	$42	$1,426
Nonresidential						
Retail	0.53	per 1,000 sq. ft.	$3,461	$1,834	$55	$1,889
Dine-in Restaurant	1.77	per 1,000 sq. ft.	$3,461	$6,126	$184	$6,310
Office (single story)	0.33	per 1,000 sq. ft.	$3,461	$1,142	$34	$1,176
Hospital	1.62	per bed	$3,461	$5,607	$168	$5,775
K-12 Schools	3.96	per 100 students	$3,461	$13,706	$411	$14,117
Heavy Industrial	0.30	per 1,000 sq. ft.	$3,461	$1,038	$31	$1,069
Colleges & Universities	0.76	per 1,000 sq. ft.	$3,461	$2,630	$79	$2,709
Church	0.22	per 1,000 square feet	$3,461	$761	$23	$784
Other Non-Residential	1.00	per 12,000 gal. (water/user/mo.)	$3,461	$3,461	$104	$3,565

Sources: DOU and EPS

Separated_6

The following **Table 3-7** is informational only and calculates the total cost of improvements by 2040 to improve the existing system and to mitigate the impacts of new growth.

Table 3-7. 2040 Estimated Capital Requirements

		Reference	Costs
Total Funding Requirement			
	Formula		
Improvements to Accommodate New Growth	a	Table 3.3	$26,346,863
Improvements to the Existing System	b	Table 3.3	$86,490,363
Master Planning Costs	c	Table 3.5	$6,850,000
Total Funding Required	**d = a + b + c**		**$119,687,225**
Funding Elements			
Development Impact Fee			
New Growth ESDs	e	Table 3.2	7,818
Cost per ESD	f	Table 3.5	$3,461
Development Impact Fee Revenue	**g = e * f**		**$27,058,301**
Non-Fee Revenue Requirement			
Total Funding Required	d		$119,687,225
Non-Fee Revenue Requirement	**h = d - g**		**$92,628,924**

Sources: DOU and EPS *Separated_7*

Comparison with Surrounding Communities

The comparison of the Separated Sewer fee with surrounding jurisdictions is shown on **Table 3-8**. The table includes a single-family land use and office and retail uses on a per 1,000 square foot basis and the same land uses on a per acre basis. Complete comparative information in chart form is presented as **Appendix C-4**, and high-level summaries are in **Chapter 1**, the **Executive Summary**.

Table 3-8. Fee Comparisons

Jurisdiction [1]	Site Area			Per Acre		
	Single Family	Retail	Office	Single Family [2]	Retail	Office
	per unit	*per 1,000 sq. ft. [3]*				
Sacramento	**$3,565**	**$1,889**	**$1,176**	**$24,954**	**$20,575**	**$17,935**
Sacramento County - Uninc.	$3,194	$2,053	$1,467	$22,360	$22,360	$22,360
Folsom	$1,073	$316	$226	$7,511	$3,438	$3,438
Roseville	$447	$149	$149	$3,129	$1,623	$2,272
West Sacramento	$7,011	$2,078	$2,078	$49,077	$22,629	$31,681
Woodland	$7,125	$2,908	$1,744	$49,875	$31,668	$26,589
Average Excluding Sacramento	**$3,770**	**$1,501**	**$1,133**	**$26,390**	**$16,344**	**$17,268**
Sacramento +/- Percent [3]	**-5%**	**26%**	**4%**	**-5%**	**26%**	**4%**

Source: EPS *Separated_8*

Note:
[1] Does not include regional sewer fees. See table sets 1.5 and 1.6 in the Executive Summary and Appendix A-2 for comparative details that include regional sewer fees.
[2] Based on 7 units per acre.
[3] Comparisons for Retail and Office land uses are based on the assumption of a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25) for Retail, and 35 percent for Office. This construct is for comparative purposes only.

The proposed fee in Sacramento appears high for retail because of very low fees in Roseville and Folsom.

Nexus Findings

For the Separated Sewer System Utility, this section addresses the following requirements of the Mitigation Fee Act (California Government Code section 66000 et seq.).

Per California Government Code Section 66001

1. Identify the purpose of the fee.
2. Identify how the fee is to be used.
3. Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed.
4. Determine how a reasonable relationship exists between the need for the facility and the type of development project on which the fee is imposed.
5. Demonstrate a reasonable relationship between the amount of the fee and the cost of the facility or portion of the facility attributable to the development on which the fee is impose.

The Separated Sewer System Development Impact Fee applies to all development in the service area in proportion to the measured expectation of sanitary sewer flow by land use type.

1. Purpose of the Fee

The purpose of the Separated Sewer System Development Impact Fee is to fund capacity improvements to accommodate projected new residential and non-residential development as detailed in **Chapter 3**.

2. Use of Fee

The Separated Sewer System Development Impact Fee will be used to fund sewer facilities needed to convey sanitary sewage generated by development in the service area to trunk lines for the regional treatment facility owned and operated by the Sacramento Regional County Sanitation District.

3. Reasonable Relationship between Use of Fee and Type of Development on Which the Fee is Imposed

The Separated Sewer System Development Impact Fee varies by development type based on measured expectation of sanitary sewer flows by development type. This proportional fee will be used to fund sanitary sewer facilities identified in **Chapter 3, Appendix C** and as set forth in the **Dynamic Model** (included by reference herein), which are designed to accommodate expected sanitary flows from new residential and nonresidential development in all basins with projected growth.

A reasonable relationship therefore exists between the use of the Separated Sewer System Development Impact Fee and the type of development on which the fee is imposed.

4. Reasonable Relationship between Need for Facility and Type of Project on Which the Fee is Imposed

New residential and nonresidential projects in the service area are required to connect to the City's sewer system. New residents, employees, and patrons of the new developments will generate increased sewer flows. Sewer facilities needed to accommodate this demand were determined based on the modelling of sewage generated by projected residential and nonresidential development by basin as set forth in **Chapter 3, Appendix C** and the **Dynamic Model**.

A reasonable relationship therefore exists between the need for sanitary sewer facilities and new residential and nonresidential development projects on which the Separated Sewer System Development Impact Fee is imposed because the portion of sewer facilities funded by the Separated Sewer System Development Impact Fee is based on the amount of sewage generated by projected residential and non-residential development.

5. Reasonable Relationship between Amount of Fee and Cost of Facilities or Portion of Facilities Attributed to Development on Which Fee is Imposed

The total cost of sanitary sewer facilities funded by the Separated Sewer System Development Impact Fee is allocated amongst the projected new residential and nonresidential land uses in the service area based on the proportional demand each land use is anticipated to generate for the sanitary sewer facilities. The cost of sanitary sewer facilities is allocated to residential and nonresidential land uses based on the estimated proportionate demand each land use is anticipated to generate for the facilities. Demand for sewer facilities is measured by sewage generation rates for each land use category.

A reasonable relationship therefore exists between the amount of the Separated Sewer System Development Impact Fee and the cost of the sanitary sewer facilities attributed to the residential and nonresidential development on which the fee is imposed because the costs are allocated based on the demand generated by new development for sanitary sewer facilities as measured by the sewage generated by each development type.

Per California Government Code Section 66013

1. Subsection (a): *Notwithstanding any other provision of law, when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed, unless a question regarding the amount of the fee or charge imposed in excess of the estimated reasonable cost of providing the services or materials is submitted to, and approved by, a popular vote of two-thirds of those electors voting on the issue.*

Finding on the Base Fee: The Separated Sewer System Development Impact Fee for capital improvements (Base Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. Costs are estimated for new facilities necessary to accommodate the demand created by modelled sewer flows from new residential and non-residential development by location and land use type.

Finding on the Administrative Component: The administrative cost portion of Separated Sewer System Development Impact Fee (Administration Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. The Administration Fee funds City costs associated with fee program administration and implementation including collection and accounting, annual reporting, capital planning, periodic updates to the Separated Sewer System Development Impact Fee, and other related costs.

2. Subsection (c): *A local agency receiving payment of a charge as specified in paragraph (3) of subdivision (b) shall deposit it in a separate capital facilities fund with other charges received, and account for the charges in a manner to avoid any commingling with other moneys of the local agency, except for investments, and shall expend those charges solely for the purposes for which the charges were collected. Any interest income earned from the investment of moneys in the capital facilities fund shall be deposited in that fund.*

Finding: The City of Sacramento and the Department of Utilities has the systems in place to ensure compliance with Subsection c in accordance with Generally Accepted Accounting Principles, the Government Accounting Standards Board best practices and Generally Accepted Auditing Standards.

3. Subsection (d): *For a fund established pursuant to subdivision (c), a local agency shall make available to the public, within 180 days after the last day of each fiscal year, the following information for that fiscal year:*
   (1) A description of the charges deposited in the fund.
   (2) The beginning and ending balance of the fund and the interest earned from investment of moneys in the fund.
   (3) The amount of charges collected in that fiscal year.
   (4) An identification of all of the following:
      (A) Each public improvement on which charges were expended and the amount of the expenditure for each improvement, including the percentage of the total cost of the public improvement that was funded with those charges if more than one source of funding was used.
      (B) Each public improvement on which charges were expended that was completed during that fiscal year.
      (C) Each public improvement that is anticipated to be undertaken in the following fiscal year.
   (5) A description of each interfund transfer or loan made from the capital facilities fund. The information provided, in the case of an interfund transfer, shall identify the public improvements on which the transferred moneys are, or will be, expended. The information, in the case of an interfund loan, shall include the date on which the loan will be repaid, and the rate of interest that the fund will receive on the loan.

Finding: The requirements of Subsection d are acknowledged and consistent with existing systems and practices.

4. The Combined Sewer System Utility

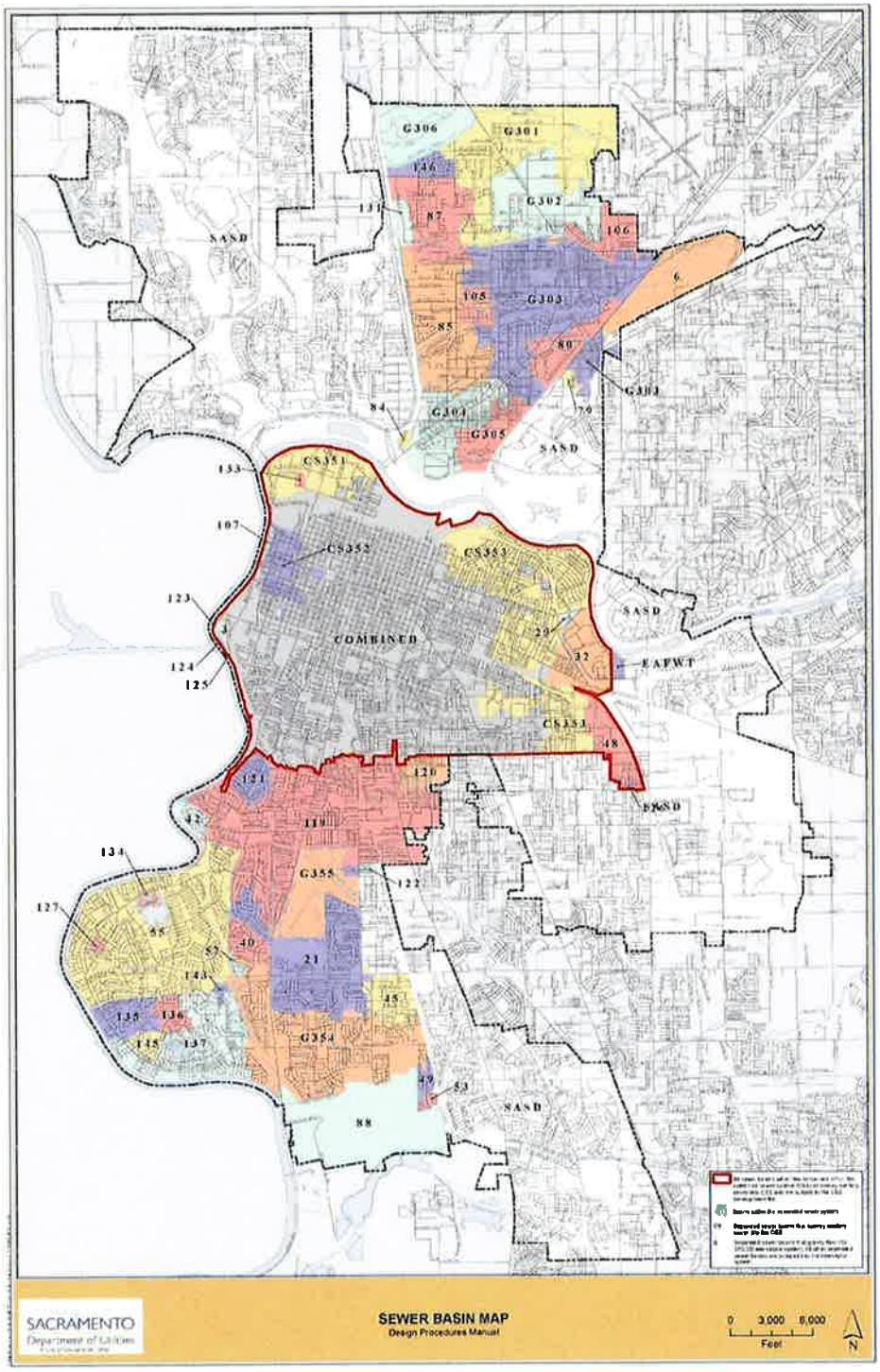
Introduction and Description

The Combined Sewer System Utility (CSS) provides wastewater and drainage services to approximately 34,000 commercial and residential properties located in the City. The CSS includes approximately 443 miles of pipe and 15 wastewater pump stations in 14 combined sewer basins. There are also 4 storage facilities, 2 of which also function as pump stations, and are included in the 15 pump stations noted above. The CSS includes treatment facilities that are used during significant wet-weather events. This system is administered by DOU to provide safe and reliable collection and conveyance of wastewater and to ensure the wastewater systems comply with all state and federal regulations.

The residential and commercial customers that receive service from the CSS constitute approximately 23 percent of the total residential and commercial customers in the City. The balance is served by the City's Separated Sewer System (discussed in **Chapter 3**) or the SASD, a separate entity not under control of the City. All of the effluent from the City systems and SASD are delivered to a regional treatment facility owned and operated by the Sacramento Regional County Sanitation District.

On the Map below (**Figure 4-1**), the boundaries of the CSS are within the red line, labeled "Combined".

Figure 4-1. Combined Sewer System Utility Boundaries and Key System and Geographic Characteristics



Growth and Demand

Because the CSS mixes storm runoff and wastewater, the primary concern is to protect public health. In a storm event, the capacity of the system may be exceeded, causing outflows to the streets and overflows to the Sacramento River. Storage allows the mix of drainage and wastewater to be held for later release when the system has the capacity to deliver the flow to the regional treatment facility.

To manage the CSS, the City uses a variety of methods to increase storage capacity to minimize the frequency and severity of outflows. As growth occurs, the primary means to increase storage capacity is to enlarge pipes for in-line storage. Funding is secured through development impact fees for that purpose, or if a larger, areawide storage project is desired, the capacity required is secured through agreements.

For new growth, because the CSS manages a mix of wastewater and drainage runoff, both impacts of sewer flow and drainage must be measured to calculate the storage requirements for each new development. For in-line storage and the supporting fees, the demand for capacity is per project and is calculated on the following two demand indicators and associated demand factors:

- For wastewater, the demand indicator is ESD, where an ESD of 1 is the expectation of average sanitary flow from a single-family detached home using average daily winter water-use data. This data is used to factor the ESD expectation for any land use.
- For drainage runoff, the demand indicator is new impermeable surface acres, or square feet. The factor is the total in a new development.

As will be discussed in more detail below, there is an interaction between the two impacts of wastewater flow and drainage runoff. This is to ensure that a standard for runoff storage of 7,600 cubic feet per acre is met by a development regardless of the development's configuration of ESDs and new impermeable surface. In effect, the storage required for wastewater mitigates a portion of the storage required for drainage, and vice-versa. Depending on a development's configuration, a development subject to a wastewater impact fee may not also require a drainage fee, or both fees may be necessary to meet the storage requirement.

Incremental Methodology and Cost per Equivalent Standard Dwelling and Impermeable Square Foot

The capital improvements required by the demands are incremental enlargements of piping to provide the storage capacity required on a per project basis. The calculation to determine the storage requirement and the cost per ESD and per impermeable square foot is shown on **Table 4-1**.

Table 4-1. Equivalent Standard Dwelling and New Impermeable Surface Storage Requirements and Costs

	formula	**Factor**
A. Sewerage		
Storage Capacity Requirement Per ESD [1]		
City Sanitary Sewage Standard (Gal./ESD) [2]	*a*	310
Maximum Sewer Generation Ratio [3]	*b*	0.401
Maximum Sewer Flow	*c = a * b*	124
Average Dilution Ratio [4]	*d*	0.067
Gallons per ESD of Storage Capacity Needed	***e = c / d***	**1,851**
Storage Cost Per ESD		
Per Foot of Pipe		
Required 48" New In-Line Storage Cost per Foot	*f*	$580
Existing 18" In-Line Storage Replacement Cost per Foot	*g*	$257
Net Cost of Required Pipe per Foot	***h = f - g***	**$323**
Per Cubic Foot of Pipe		
48" Pipe	*i*	12.56
18" Pipe	*j*	1.76
Net Cubic Feet of Required Pipe per Foot	*k = i - j*	10.80
Cost per Cubic Foot	***l = h / k***	**$29.93**
Required Storage Capacity and Cost per ESD		
Gallons of Storage Capacity Needed per ESD	*m = e*	1,851
Cubic Feet per Gallon	*n*	0.133681
Cubic Feet of Storage Capacity Needed per ESD	*o = m * n*	247.41
Cost per Cubic Foot	*l*	$29.93
Storage Capacity Cost per ESD	***p = o * l***	**$7,406**
B. Drainage		
New Impervious Surface Requirement and Cost Per Square Foot		
Storage Requirement per Acre (cu. ft.) [5]	*q*	7,600
Cost per Cubic Foot	*h*	$29.93
Cost Per Impervious Acre	*r = h * q*	$227,496
Cost Per Impervious Square Foot	***s = r / 43,560***	**$5.22**

Source: DOU *Combined_1*

Notes:

[1] The InfoWorks ICM Model determines maximum percentage of daily sanitary sewage generation expected during the height of a 10-year, 6-hour storm event.

[2] The current City of Sacramento Design and Procedures Manual, Section 9.4.7.

[3] The InfoWorks ICM Model estimates that the average flooding duration at areas with the worst outflows is approximately 7.2 hours. Based on the diurnal curve created from wastewater flow data in the combined sewer system, the maximum sewer generation during a 7.2 hour period is 40.1% of the total daily flow.

[4] Source files: City of Sacramento, InfoWorks ICM Model.

[5] The current Onsite Design Manual, Figure 10 storage requirement for detention in a 100-year storm event.

As can be seen in **Table 4-1**, each ESD requires the creation of 1,855 gallons for storage. With a full pipe, and after applying the dilution ratio (the letter "d" in the formula), that storage will be composed of 124.3 gallons of wastewater, and 1,731 gallons of drainage. The drainage mitigated of 1,731 gallons, or 231.4 cubic feet, can be used for the required drainage mitigation that comes from increasing the impervious area of the site being developed. This requirement is 7,600 cubic feet per acre of new impermeable surface. In square foot terms, 1,326.3 square feet of new impermeable surface is mitigated by one ESD [i.e., 1,326.3=(231.4/43,560)*7,600].

It is possible for a development with enough ESDs relative to its parcel size to satisfy the drainage storage requirement from the drainage storage created by mitigating for ESDs. Examples of a range of developments are shown on **Table 4-2**.

Table 4-2. Capacity Requirements Examples

	Formula	Examples 1	2	3	4
ESDs	*a*	1	6	60	250
New Impermeable Acreage	*b*	0.125	0.5	2	4
Required Mitigation in Cu. Ft.	*c = b * 7,600 cu.ft./acre*	950	3,800	15,200	30,400
Required Mitigation in Sq. Ft.	*d = (c / 7,600) * 43,560)*	5,445	21,780	87,120	174,240
Drainage Storage Mitigated by ESD Mitigation					
Drainage Mitigated in Cu. Ft.	*e = a * 231.4 cu.ft.*	231.4	1,388.4	13,884.0	57,850.0
Drainage Mitigated in Sq. Ft.	*f = (e / 7,600) * 43,560)*	1,326.3	7,957.7	79,577.2	331,571.8
Remaining Required Mitigation and Fee					
In Cubic Feet	*g = c - e cu.ft.*	718.6	2,411.6	1,316.0	(27,450.0)
In Square Feet	*h = d - f sq.ft.*	4,118.7	13,822.3	7,542.8	(157,331.8)
Sewer Fee		yes	yes	yes	yes
Drainage Fee		yes	yes	yes	none

Sources: DOU and EPS. *Combined_2*

Example number 4, with 250 ESDs on 4 acres, would satisfy the drainage requirement through ESDs alone. The drainage fee would be fully credited. The other examples would pay reduced drainage fees based on the drainage mitigated through the ESDs. These same examples are presented in dollar terms on **Table 4-6** later in this chapter, below the discussion of the fees.

Planning costs are being employed to help defray the cost of capacity improvements. These costs are being shared on a proportional basis between new growth and existing customers in accordance with the existing customer base by land use and the projected growth by land use in 2040. The calculation of proportional shares is shown on **Table 4-3**.

Table 4-3. New and Existing ESDs

Residential

Units		Units				ESDs		
		2017 Units	2022 Units	2040 Units	Unit Growth	ESD Factors	Existing ESDs	ESD Growth
	formula:		*a*	*b*	*c = b - a*	*d*	*e = a * d*	*f = c * d*
Single Family Detached		12,327	12,357	12,646	289	1	12,357	289
Single Family Attached		4,417	4,724	10,981	6,257	0.5	2,362	3,129
Multifamily		23,648	28,244	53,118	24,874	0.5	14,122	12,437
Totals		**40,392**	**45,325**	**76,745**	**31,420**		**28,841**	**15,855**

Non-Residential

Employment	Square Feet per Employee	Units				ESDs		
		2017 Units	2022 Units	2040 Units	Unit Growth	ESD Factors	Existing ESDs	ESD Growth
	formula:	*a*	*d*	*f*	*h = f - d*			
Retail/Food		23,313	23,494	28,329	4,835			
Office		199,822	200,023	217,489	17,466			
Manufacturing/Other		38,211	39,188	57,670	18,482			
Totals		**261,346**	**262,705**	**303,488**	**40,783**			

Square Feet (in 1,000s)

formula:	*b*	*c = (a * b) / 1000*	*e = (d * b) / 1000*	*g = (f * b) / 1000*	*i = g - e*	*j*	*k = e * j*	*l = I * j*
Retail/Food [1]	500	11,657	11,747	14,165	2,418	0.25	2,937	605
Office	200	39,964	40,005	43,498	3,493	0.5	20,003	1,747
Manufacturing/Other [2]	500	19,105	19,594	28,835	9,241	0.25	4,899	2,310
Totals		**70,726**	**71,346**	**86,498**	**15,152**		**27,838**	**4,661**
ESD Totals							**56,679**	**20,516**

Sources: DOU and EPS *Combined_3*

Notes:
[1] Weighted average of Retail and Food land uses.
[2] Weighted average of Educational, Medical, Services and Industrial land uses.

The allocation of planning costs to existing and new growth and the cost per ESD is shown on **Table 4-4**.

Table 4-4. Cost per ESD with Planning Costs

	Reference	*Formula*	**Factors**
2022 Existing ESDs	*Table 4.3*	*a*	56,679
2040 New ESDs	*Table 4.3*	*b*	20,516
2040 Total ESDs		*c = a + b*	77,195
Master Planning Cost		*d*	$511,000
Master Planning Cost per ESD		*e = d / c*	$7
Storage Capacity Cost per ESD	*Table 4.1*	*f*	$7,406
Total Cost per ESD		***g = e + f***	**$7,413**

Sources: DOU and EPS *Combined_4*

Planning costs of $511,000 are shared by existing and new development at a cost of $7 per ESD. The base and planning fee per ESD for new growth is $7,413.

The schedule of the fee by land use is shown on **Table 4-5** on the following page. A further detailed schedule is included as **Appendix D-1**.

Table 4-5. Development Impact Fee Schedule—Sewerage and Drainage

By Land Use	ESD	Factor	Cost per ESD	Cost by Land Use and Factor	Administrative Fee (3%)	Fee
Formula:	*a*		*b*	*c = a * b*	*d = c * 3%*	*e = c + d*
Sewerage						
Residential						
Single Family Detached	1.00	per dwelling	$7,413	$7,413	$222	**$7,635**
Apartment	0.66	per dwelling	$7,413	$4,893	$147	**$5,039**
Hotel/Motel	0.43	per room	$7,413	$3,188	$96	**$3,283**
Single Family Attached, Duplex, Triplex, Quadplex and Similar	0.83	per dwelling	$7,413	$6,153	$185	**$6,337**
College Dorm or Boarding House	0.4	per bed or resident	$7,413	$2,965	$89	**$3,054**
Nonresidential						
Retail	0.53	per 1,000 sq. ft.	$7,413	$3,929	$118	**$4,047**
Dine-in Restaurant	1.77	per 1,000 sq. ft.	$7,413	$13,121	$394	**$13,515**
Office (single story)	0.33	per 1,000 sq. ft.	$7,413	$2,446	$73	**$2,520**
Hospital	1.62	per bed	$7,413	$12,009	$360	**$12,369**
K-12 Schools	3.96	per 100 students	$7,413	$29,355	$881	**$30,236**
Heavy Industrial	0.30	per 1,000 sq. ft.	$7,413	$2,224	$67	**$2,291**
Colleges & Universities	0.76	per 1,000 sq. ft.	$7,413	$5,634	$169	**$5,803**
Church	0.22	per 1,000 square feet	$7,413	$1,631	$49	**$1,680**
Other Non-Residential	1.00	per 12,000 gal. (water/user/mo.)	$7,413	$7,413	$222	**$7,635**
Drainage						
New Impervious Surface Cost per Square Foot - All Land Uses				$5.22	$0.16	**$5.38**

Sources: DOU and EPS

Combined_5

Note:

[1] See the report text for an explanation of the interaction between the sewer fee and the drainage fee.

If the sewer fee is charged first on a project, the drainage fee is reduced or is not applied, depending on a project's configuration. A few examples are shown on **Table 4-6**.

Table 4-6. Fee Examples

	Formula	Examples 1	2	3	4
ESDs	*a*	1	6	60	250
New Impermeable Acres	*b*	0.125	0.5	2	4
New Impermeable Sq. Ft.	*c = b * a*	5,445	21,780	87,120	174,240
Sewer Fee per ESD	*d*	$7,635	$7,635	$7,635	$7,635
Drainage fee per Sq. Ft.	*e*	$5.38	$5.38	$5.38	$5.38
Sewer Fee	*f = a * d*	$7,635	$45,812	$458,123	$1,908,848
Drainage Fee	*g = c * e*	$29,290	$117,161	$468,642	$937,284
Drainage Credit	*h = See Note [1]*	($7,134)	($42,807)	($428,068)	($937,284)
Total Fee	***i = e + f - g***	**$29,791**	**$120,166**	**$498,698**	**$1,908,848**

Sources: DOU and EPS. *Combined_6*

Note:
[1] This is the value in drainage fees of the drainage mitigated by the sewer fee. The percent of the 7,600/acre standard for storage mitigated by ESDs (231.4 cu.ft./ESD) is converted to the land square feet mitigated (see Tables 4.1 and 4.2) and multiplied by the drainage fee per square foot. Credit is applied up to the full value of the drainage fee.

Drainage fees could be charged first, in which case, the relationships are reversed with the same cost outcome.

Table 4-7 is informational only and calculates the total cost of improvements by 2040 to mitigate the sewer impacts of new growth.

Table 4-7. 2040 Sewer Improvement Costs and Revenue at Buildout

	reference	*formula*	**Factors**
Total Cost per ESD	*Table 4.4*	*a*	$7,413
Total New 2040 ESDs	*Table 4.3*	*b*	20,516
Improvement Costs and Revenue with Buildout		***c = a * b***	**$152,083,255**

Sources: DOU and EPS Combined_7

Also for informational purposes, **Table 4-8** shows a forecast of the typical method to determine new impermeable surfaces.

Table 4-8. Vacant Acres and Impervious Surface

Maximum Impervious Surface

Land Use	Parcels	Acres	Impervious Surface Coeffient (ISC)	Impervious Surface Buildout Acres	Impervious Surface Buildout Square Feet
	formula:	*a*	*b*	*c = a * b*	*d = c * 43,560*
Industrial	174	180	85%	153	6,672,007
Irregular/Waste	207	39	90%	35	1,523,153
Office	94	73	90%	66	2,862,779
Public [1]	43	18	90%	16	697,562
Recreation [2]	4	9	5%	0	19,639
Residential	557	177	50%	89	3,860,476
Retail/Commercial	176	112	90%	101	4,409,061
Totals	**1,255**	**609**		**460**	**20,044,678**

Sources: DOU and EPS Combined_8

Notes:
[1] The Number of Parcels, and Area values for the "Public" landuse are left unchanged from the 2015 update.
[2] Recreation has had one parcel removed from the calculations, a 109 acre parcel in the railyards area. This area has had its area distributed to the office, residential, public, and retail land use calculations.

A standard expectation would be construction costs and revenue to approximate $105 million at $5.22 per square foot in the CSS service area. But as shown above, the drainage mitigation provided by the development of ESDs reduces or eliminates a drainage mitigation requirement.

Comparison with Surrounding Communities

The comparison of the CSS with surrounding jurisdictions is shown on **Table 4-9**. The table is for the sewer fee only and includes a single-family land use and office and retail uses on a per 1,000 square foot basis and the same land uses on a per acre basis. Complete comparative information in chart form is presented as **Appendix D-2**, and high-level summaries are in **Chapter 1**, the **Executive Summary**.

Table 4-9. Fee Comparisons

Jurisdiction [1]	Site Area			Per Acre		
	Single Family	Retail	Office	Single Family [2]	Retail	Office
	per unit	*per 1,000 sq. ft. [3]*				
Sacramento	**$7,635**	**$4,047**	**$2,520**	**$53,448**	**$44,069**	**$38,415**
Sacramento County - Uninc.	$3,194	$2,053	$1,467	$22,360	$22,360	$22,360
Folsom	$1,073	$316	$226	$7,511	$3,438	$3,438
Roseville	$447	$149	$149	$3,129	$1,623	$2,272
West Sacramento	$7,011	$2,078	$2,078	$49,077	$22,629	$31,681
Woodland	$7,125	$2,908	$1,744	$49,875	$31,668	$26,589
Average Excluding Sacramento	**$3,770**	**$1,501**	**$1,133**	**$26,390**	**$16,344**	**$17,268**
Sacramento +/- Percent [3]	**103%**	**170%**	**122%**	**103%**	**170%**	**122%**

Source: EPS *Combined_9*

Note:
[1] Does not include regional sewer fees. See table sets 1.5 and 1.6 in the Executive Summary and Appendix A-2 for comparative details that include regional sewer fees.
[2] Based on 7 units per acre.
[3] Comparisons for Retail and Office land uses are based on the assumption of a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25) for Retail, and 35 percent for Office. This construct is for comparative purposes only.

Importantly, a comparative table for the drainage element of the fee cannot be made because of the credit system in Sacramento. Typically, drainage fees are for all new impermeable surface, including buildings. In Sacramento, direct credits are given for drainage mitigation as a result of the sewer mitigation required for new ESDs. No jurisdiction in the area has a comparable system of any magnitude.

The proposed fees are the highest in the region because of the realities of a combined system: a high storage requirement to mitigate the health risks of the combined wastewater and drainage flows from the system.

Nexus Findings

For the Combined Sewer System Utility (CSS), this section addresses the following requirements of the Mitigation Fee Act (California Government Code section 66000 et seq.) as it relates to the Combined Sewer System Utility and as discussed in **Chapter 4**, which is incorporated here by reference.

Per California Government Code Section 66001

1. Identify the purpose of the fee.
2. Identify how the fee is to be used.
3. Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed.

4. Determine how a reasonable relationship exists between the need for the facility and the type of development project on which the fee is imposed.

5. Demonstrate a reasonable relationship between the amount of the fee and the cost of the facility or portion of the facility attributable to the development on which the fee is impose.

The Combined Sewer System Development Impact Fee includes two fees, one for sewer and one for runoff, and applies to all development in the service area. The sewer fee is in proportion to the measured expectation of sanitary sewer flow by land use type. The drainage portion is in proportion to new impermeable square footage and applies only if drainage is not mitigated by the sewer fee as explained below and in **Chapter 4**.

1. Purpose of the Fee

The purpose of the Combined Sewer System Development Impact Fee is to fund capacity improvements to accommodate projected new residential and non-residential development as detailed in **Chapter 4.**

2. Use of Fee

The Combined Sewer System Development Impact Fee will be used to fund sewer pipe capacity or equivalent improvements to convey and store sanitary sewage and drainage runoff generated by development in the service area to mitigate the risk of river, roadway and property contamination during storm events. Release of this combined storage is timed to coincide with available capacity for discharge to trunk lines connected to the regional treatment facility, which is owned and operated by the Sacramento Regional County Sanitation District.

3. Reasonable Relationship between Use of Fee and Type of Development on Which the Fee is Imposed

The Combined Sewer System Development Impact Fee varies by development type and parcel size. Development in the CSS typically creates net-new sewer flows and net-new impermeable surfaces, both of which impact the CSS. Because sewer and runoff mix in the CSS and require the same storage medium (48" in-line pipes), mitigated sewer flows also mitigate a measured volume of storm-event runoff. Please see **Table 4-1 in Chapter 4** for detailed calculations and discussion of these interactions. The Combined Sewer System Development Impact Fee takes these interactions into account by development type and parcel size in the calculation of the fee.

Sewer generation rates by land-use type are measured for typical flows by way of an index termed Equivalent Dwelling Unit (EDU) where the typical single-family home has a EDU of one. The sewer portion of the Combined Sewer System Development Impact Fee is a per EDU fee and is the cost to mitigate the impact of each EDU. A proposed development in the CSS will include the land-use type(s) and the required sewer EDUs and a measure of new impermeable surfaces on the

parcel(s) involved. If the mitigation required for runoff is less than the runoff mitigation provided by the required EDUs, only the sewer portion of the Combined Sewer System Development Impact Fee applies. If drainage remains to be mitigated, the drainage portion of the Combined Sewer System Development Impact Fee is applied to the unmitigated portion on a per square foot basis. The fee is the cost of storage, using the same storage medium, to satisfy the established standard for runoff mitigation in the CSS to minimize the risks of contamination from storm events.

A reasonable relationship therefore exists between the use of the Combined Sewer System Development Impact Fee and the type of development on which the fee is imposed.

4. Reasonable Relationship between Need for Facility and Type of Project on Which the Fee is Imposed

New residential and nonresidential projects in the service area are required to connect to the CSS system. New residents, employees, and patrons of the new developments will generate increased sewer and drainage flows. Storage needed to accommodate this demand were determined based on the modelling of sewage and storm water runoff generated by existing and projected residential and nonresidential development.

A reasonable relationship therefore exists between the need for CSS storage facilities and new residential and nonresidential development projects on which the Combined Sewer System Development Impact Fee is imposed because the portion of storage facilities funded by the Combined Sewer System Development Impact Fee is based on the amount of sewage and runoff generated by projected residential and non-residential development.

5. Reasonable Relationship between Amount of Fee and Cost of Facilities or Portion of Facilities Attributed to Development on Which Fee is Imposed

The Combined Sewer System Development Impact Fee is the cost of storage capacity. The cost is allocated amongst the projected new residential and nonresidential land uses in the service area based on the proportional demand each development is anticipated to generate for storage capacity.

A reasonable relationship therefore exists between the amount of the Combined Sewer System Development Impact Fee and the cost of the sanitary sewer facilities attributed to the residential and nonresidential development on which the fee is imposed because the costs are allocated based on the demand generated by new development for storage capacity as measured by the new impermeable surface of development parcels and by the sewage generated by each development type.

Per California Government Code Section 66016.5 (AB 602)

The section is included to address the drainage element of the Combined Sewer System Development Impact Fee. Most requirements of the legislation are met in the findings under 66001. Those that are not yet addressed are as follows.

1. Exception requirement to the housing square footage basis:

a) An explanation as to why square footage is not an appropriate metric to calculate fees imposed on a housing development project.

b) An explanation that an alternative basis of calculating the fee bears a reasonable relationship between the fee charged and the burden posed by the development.

c) That other policies in the fee structure support smaller developments, or otherwise ensure that smaller developments are not charged disproportionate fees.

The findings for the exception are as follows:

a) An explanation as to why square footage is not an appropriate metric to calculate fees imposed on a housing development project.

New imperious surfaces drive the demand for drainage facilities. In housing developments, new impervious surfaces incorporate the footprint on a parcel, capturing ground floor living spaces as well as driveways, sidewalks, patios and other such surfaces. A square footage of proposed units basis would introduce inequities. For example, a two-story home with the same footprint as a single-story home would pay twice the fee while causing an identical impact on the drainage system. This inequity would be amplified in multistory apartment and condominium buildings or towers.

b) An explanation that an alternative basis of calculating the fee bears a reasonable relationship between the fee charged and the burden posed by the development.

For storm water runoff, the standard, customary and equitable method to establish a reasonable relationship between the fee charged, the facilities required, and the type of development on which the fee is imposed is with a direct measure of new impermeable surfaces. New runoff as a result of development establishes the demand for new or improved capacity, the cost of which is the basis of the fee.

c) That other policies in the fee structure support smaller developments, or otherwise ensure that smaller developments are not charged disproportionate fees.

A fee basis of impermeable square footage ensures equity for the allocation of the cost of the impact from development. The fee is proportional to the impact caused by new impermeable surfaces. Smaller developments with identical unit footprints

will have the same fees. Smaller footprints will have proportionately lower fees. Similarly, multifamily apartment building and towers will have lower impacts and fees on a per unit basis as the size of the units decline and/or the number of floors increase.

2. Capital improvement plan requirement as part of a nexus study:

Capital improvements funded by the Combined Sewer System Development Impact Fee are limited to pipe enlargements on a per project basis or to periodic areawide storage facilities. Areawide improvements involve separate agreements with developers and may include a proportionate share funded by fee revenue. Project master planning and programming are carried out as part of the annual budget process.

3. Blanket statement on the remaining requirements of 66013:

The remaining requirements of 66013 are either addressed in the findings under **66001, 66013** below and in **Chapter 4**, all of which are incorporated herein by reference, or will be through the public outreach, public hearing and adoption process, implementation process and the accounting and reporting process, all of which are acknowledged.

Per California Government Code Section 66013

1. Subsection (a): *Notwithstanding any other provision of law, when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed, unless a question regarding the amount of the fee or charge imposed in excess of the estimated reasonable cost of providing the services or materials is submitted to, and approved by, a popular vote of two-thirds of those electors voting on the issue.*

Finding on the Base Fee: The Combined Sewer System Development Impact Fee for capital improvements (Base Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. Costs are estimated for new facilities necessary to accommodate the demand created by modelled sewer flows from new residential and non-residential development by land-use type.

Finding on the Administrative Component: The administrative cost portion of Combined Sewer System Development Impact Fee (Administration Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. The Administration Fee funds City costs associated with fee program administration and implementation including collection and accounting, annual reporting, capital planning, periodic updates to the Combined Sewer System Development Impact Fee, and other related costs.

2. Subsection (c): *A local agency receiving payment of a charge as specified in paragraph (3) of subdivision (b) shall deposit it in a separate capital facilities fund with other charges received, and account for the charges in a manner to avoid any commingling with other moneys of the local agency, except for investments, and shall expend those charges solely for the purposes for which the charges were collected. Any interest income earned from the investment of moneys in the capital facilities fund shall be deposited in that fund.*

Finding: The City of Sacramento and the Department of Utilities has the systems in place to ensure compliance with Subsection c in accordance with Generally Accepted Accounting Principles, the Government Accounting Standards Board best practices and Generally Accepted Auditing Standards.

3. Subsection (d): *For a fund established pursuant to subdivision (c), a local agency shall make available to the public, within 180 days after the last day of each fiscal year, the following information for that fiscal year:*
   (1) A description of the charges deposited in the fund.
   (2) The beginning and ending balance of the fund and the interest earned from investment of moneys in the fund.
   (3) The amount of charges collected in that fiscal year.
   (4) An identification of all of the following:
      (A) Each public improvement on which charges were expended and the amount of the expenditure for each improvement, including the percentage of the total cost of the public improvement that was funded with those charges if more than one source of funding was used.
      (B) Each public improvement on which charges were expended that was completed during that fiscal year.
      (C) Each public improvement that is anticipated to be undertaken in the following fiscal year.
   (5) A description of each interfund transfer or loan made from the capital facilities fund. The information provided, in the case of an interfund transfer, shall identify the public improvements on which the transferred moneys are, or will be, expended. The information, in the case of an interfund loan, shall include the date on which the loan will be repaid, and the rate of interest that the fund will receive on the loan.

Finding: The requirements of Subsection d are acknowledged and consistent with existing systems and practices.

5. The Storm Drainage System Utility

Introduction and Description

The City DOU Storm Drainage System Utility (Storm Drainage System) is responsible for managing creeks, streams, and stormwater runoff to prevent flooding of streets and properties and to mitigate contamination from pollution and pathogens. Specifically, the Storm Drainage System is required to design improvements that:

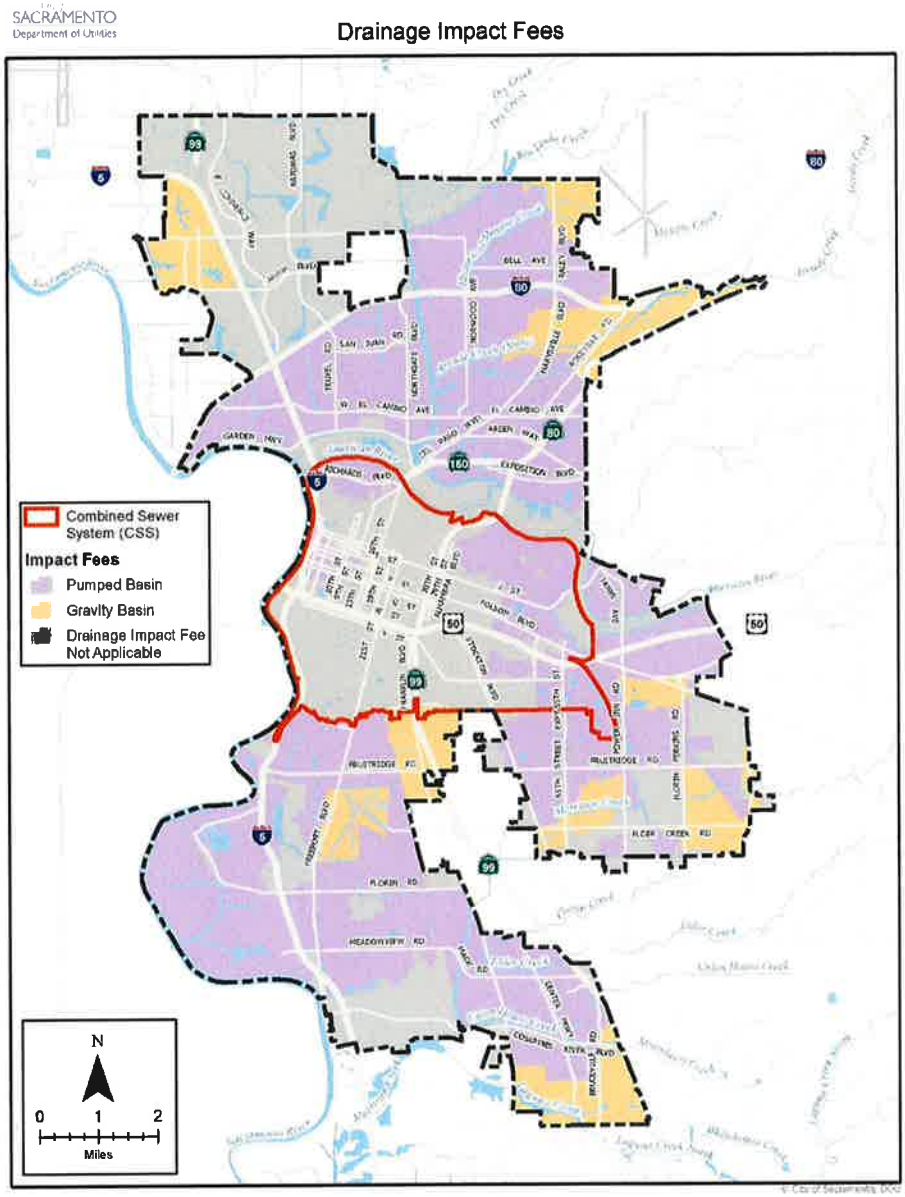
- Meet the needs of a growing community.
- Provide a minimum 100-Year Event protection to structures.
- Provide a minimum 10-Year Event protection to streets.
- Control urban runoff pollutants.
- Avoid public safety hazards.

Effective stormwater management is complicated in Sacramento by the City's mostly flat topography and location on a low-lying flood plain. More than all other cities in California, less reliance can be placed on gravity to manage runoff. A system of primary and secondary levees largely surrounds the City and is managed by the Sacramento Area Flood Control Agency (SAFCA) Joint Powers Authority, which includes the City as a member. The City's separate Storm Drainage System must often pump all runoff up through the levees to discharge to the rivers. Within the system itself, design considerations are focused on the capacity for temporary storage, as well as the normal considerations for conveyance. As a result, the system consists of local storm drains, in-line flow controls, levees, pumps, and pipes to collect, store, filter, and clean stormwater in 134 separate drainage basins serving approximately 155,000 parcels.

For land use, every parcel has an allowable runoff, as determined by the size and capacity of a basin. If a new development proposes to exceed that allowance, either onsite storage must be provided or an agreement must be entered into that provides for another mitigation measure. All of the above attributes of the Storm Drainage System are necessary to mitigate the risk of flooding and of polluting rivers and water sources. Adequate maintenance and capacity improvements are required for both existing and new development.

A map of the area affected by the storm drainage impact fee is shown on **Figure 5-1**.

Figure 5-1. Storm Drainage System Utility Boundaries and Key System and Geographic Characteristics



The areas labelled as "Pumped" or "Gravity" Basins denote basins with two different asset characteristics. Each basin type includes assets that are used in common, such as pump stations in Pumped Basins, and in all basins, main drainage lines, storage basins, or canals servicing a large area. Not included are smaller lines serving individual properties or large, master planned communities, where the drainage infrastructure has been installed and is maintained by separate agreements. Most of the North Natomas area and the Delta Shores development in the southern part of the City are examples of these excluded areas.

Growth, Demand, and Allocations

The key measure of demand for stormwater services is impermeable (or impervious) surface. New impermeable surface is driven primarily by the development of "greenfields" or the redevelopment of existing development to new or more intensives uses. Projected new growth in the service area by residential and nonresidential land uses through 2040 is displayed on **Table 5-1**.

Table 5-1. New Growth by Acreage, Residential Units, and Nonresidential Square Feet

Residential Units	Acres [1]	Units
Single Fam Residential (6 - 8 DU/acre)	905	5,891
Multifamily MDR (<30 DU/acre)	261	3,601
Multifamily HDR (30+ DU/acre)	548	15,808
Total	**1,714**	**25,300**

Non-Residential [2]		Square Feet in Thousands (1000's)
Retail/Food	155	2,461
Office/Services	450	4,604
Medical	264	2,746
Educational	46	1,438
Industrial	908	3,710
Total	**1,823**	**14,959**
Total Acreage	**3,536**	

Sources: City of Sacramento Department of Community Development, EPS. *Storm_1*

All new growth data is specific by parcel for land use type, for numbers of units or employees, for parcel size, and for other factors. As shown, **Table 5-1** summarizes acreage by land use and units of housing. Nonresidential land uses include estimated building square footage based on expectations of the space required per projected future employees. The factors, or "coefficients," used are provided in **Appendix A-1**.

Buy-In Methodology, Fee Calculation, and Credits

To accommodate the growth, an impact fee is proposed to participate in capital capacity improvements benefitting new growth or to create new capacity solely attributable to new growth. For these purposes, a buy-in approach to a development impact fee is being employed. As mentioned above, every parcel is assigned an allowable runoff, which is defined in the City's On-Site Design Manual. This allowable runoff is an allocation of available capacity in a basin to each parcel based on parcel size. Use of this allocation is also a use of a share of existing assets that has been paid for by current rate payers. Future customers will "buy in" to a proportional share of these assets by way of a buy-in development impact fee.

To determine an appropriate fee, this analysis includes only the key assets of the Storm Drainage System that could be efficiently valued (large diameter pipe mains and pump stations). Canals, ditches, drainage basins, and other assets for which replacement values or costs could not reasonably be obtained are not included. The assets used to establish value were classed into two types of basins, Zones, because of their similar assets: pumped or gravity basins. **Figure 5-1** above shows the location of these two Zones. City staff employed a two-step process to determine the estimated value of existing storm drainage assets. First, the estimated replacement cost in 2022 dollars was determined by City staff. Second, the existing values were depreciated based on their anticipated remaining useful life, so only the value of the remaining useful life is included as part of the fee calculation. **Table 5-2** shows the estimated total replacement value of system assets, the accumulated depreciation of those assets, and the current value by basin type.

Table 5-2. Existing Assets

Summary [1]	Replacement Cost	Depreciation	Current System Value
Pumped Basins Zone			
Pump Stations	$323,120,611	$265,152,773	$57,967,838
Drainage Mains	$272,920,396	$166,481,442	$106,438,954
Total Pumped Basins	**$596,041,007**	**$431,634,215**	**$164,406,792**
Gravity Basins Zone			
Drainage Mains	**$62,740,618**	**$38,271,777**	**$24,468,841**
Total Storm Drainage System	**$658,781,625**	**$469,905,992**	**$188,875,633**

Source: DOU *Storm_2*
[1] Details of the asset values by basin are included in Appendix E-1.

The depreciated value of existing Storm Drainage System assets is calculated by dividing the depreciated value of improvements by the total acreage in each respective basin Zone (gravity and pumped), as shown in **Table 5-3**.

Table 5-3. System Value per Acre by Basin Type [1]

	Factor
Pumped Basins Zone	
Current System Value	$164,406,792
Total Acreage	32,789
Value per Acre	**$5,014**
Gravity Basins Zone	
Current System Value	$24,468,841
Total Acreage	8,135
Value per Acre	**$3,008**

Source: DOU Storm_3

Note:
[1] Gross developable acres.

Given the value per acre of the capacity, a second step is necessary to allocate the value of the capacity equitably across all configurations of properties that affect runoff. The measure used for this purpose is impermeable surface.

To determine the current value of the Storm Drainage System on an impermeable surface basis, the entire system was evaluated to determine the weighted average impermeable surface for all land uses. The summary of that analysis is presented in **Table 5-4**.

Table 5-4. Weighted Average Impermeable Surface Coefficient [1]

Customer Class	Parcels	Gross Acres	ISC	Impermeable Acres
Agriculture	14	310.5	0.04	12.4
Airport	3	179.5	0.30	53.9
Cemetery	19	76.3	0.10	7.6
Churches & Welfare	556	1,322.0	0.80	1,057.6
Common Area	910	632.9	0.30	189.9
Golf	9	817.9	0.10	81.8
Industrial	2,065	4,011.2	0.86	3,449.6
MFR1	2,360	227.6	0.84	191.2
MFR2	10,736	2,745.7	0.70	1,922.0
MFR3	3,837	1,373.5	0.52	714.2
Miscellaneous	1,062	215.8	0.10	21.6
Office	1,792	2,017.1	0.80	1,613.6
Park	780	2,476.5	0.10	247.6
Personal Care & Health	118	228.1	0.80	182.5
Public & Utilities	1,093	2,919.6	0.44	1,284.6
Recreational	21	122.7	0.80	98.2
Retail / Commercial	3,202	2,436.6	0.86	2,095.5
SFR1	18,085	1,195.0	0.66	788.7
SFR2	94,051	14,425.4	0.54	7,789.7
SFR3	7,452	3,202.2	0.35	1,120.8
Vacant	5,754	5,763.9	0.10	576.4
Totals	**154,879**	**46,699.8**	**0.5032**	**23,499.3**

Sources: DOU, ***NBS [2]*** *and EPS* *Storm_4*

Note:
[1] The ISC is the proportion of land that is impermeable.
[2] The table is a compilation from data included in the NBS study for a Storm Drainage System maintenance fee: City of Sacramento Storm Drain Utility Property Related Fee Study, NBS, December 2021.

The average impermeable surface for all lands in the Storm Drainage System is 50.32 percent, or an Impervious Surface Coefficient (ISC) of 0.5032. The value of the capacity of the system on a per impermeable acre and square foot basis is as shown in **Table 5-5** for each basin Zones.

Table 5-5. System Value per Impervious Acre and Square Foot by Basin Type

Pumped Basins Zone	*formula*	**Factor**
Value per Gross Developable Acre [1]	*a*	$5,014
Average ISC	*b*	0.5032
Value per Impermeable Acre	***c = a / b***	**$9,964**
Value per Impermeable Square Foot	***d = c / 43.560***	**$0.2287**
Gravity Basins Zone		
Value per Gross Developable Acre [1]	*d*	$3,008
Average ISC	*e*	0.5032
Value per Impermeable Acre	***f = d / e***	**$5,978**
Value per Impermeable Square Foot	***g = f / 43.560***	**$0.1372**

Source: DOU Storm_5
Note:
[1] Table 5.3

The entitlement process in DOU requires the identification of new impermeable surface square feet for all new development. This is determined by City staff and the applicant either through a drainage study or other means such as an existing study in a master planned area. The values per impermeable square foot in **Table 5-5** are, therefore, also the base fees by basin type. To support planning for capacity improvements, the impact fee includes an additional $329 fee per acre, and the proposed fees will include a 3 percent administrative charge. These calculations and the final fee per square foot by Zone are shown in **Table 5-6**.

Table 5-6. Fee per Impervious Square Foot by Basin Type

Pumped Basins Zone	*formula*	**Factor**
Base Fee per Impervious Acre (Table 5)	*a*	$9,964
Master Planning Fee	*b*	$329
Subtotal	*c = a + b*	$10,293
Administrative Fee	*d*	3%
Fee per Impervious Acre	*e = (d + 1) * c*	$10,602
Fee per Impervious Square Foot	***f = e / 43,560***	**$0.2434**
Gravity Basins Zone		
Base Fee per Impervious Acre (Table 5)	*g*	$5,978
Master Planning Fee	*h*	$329
Subtotal	*i = g + h*	$6,307
Administrative Fee	*j*	3%
Fee per Impervious Acre	*k = (j + 1) * i*	$6,496
Fee per Impervious Square Foot	***l = k / 43,560***	**$0.1491**

Source: DOU and EPS

Storm_6

As mentioned above, the identification of new impermeable surfaces would occur during the entitlement process. Full credits are applied to existing impermeable surfaces.

Fee per Developable Acre and Square Foot

The fee would apply on a per impermeable square foot basis. For informational purposes, the expected cost for a greenfield development is calculated below. These calculations are on a developable acre and square foot basis and are also used for comparative purposes with other jurisdictions.

For context, most new growth in Sacramento will not be greenfield development. The majority of new growth in Sacramento is projected to be reuse or the intensification of development. A 100 percent credit is applied to existing impermeable surfaces. Most properties will be levied lower fees, or even no fees, as a result.

The expected cost on a gross, greenfield developable acre and square foot basis requires a reasonable standard with which to project new impermeable surfaces by land use. That standard cannot be the actual, measured ISC for existing development in **Table 5-4** because new development is generally denser than has historically been the case.

The standard to be used is the ISC, but as standardized statewide through research by, and adopted by, the California Environmental Protection Agency.[3] Although similar in some respects to some of the actual, measured ISCs, the State of California standard specifies the expected impervious surface of all major land use types for future development.

The tables that follow apply the standard to projected development by land use type and calculate the base fee per developable acre and square foot. **Table 5-7** calculates the fee for the Pumped Basins Zone. **Table 5-8** calculates the fee for the Gravity Basins Zone.

Table 5-7. Pumped Basins Zone Fee Calculation by Land Use per Gross Developable Acre and Square Foot

Pumped Basins Zone	ISC Standard By Land Use		Impervious Square Feet Per Gross Developable Acre	Fee Per Impervious Square Foot [1]	Fee Per Gross Developable Acre	Fee Per Gross Developable Square Foot
Land Use	As Percent	As Ratio				
formula:	*a*	*b*	*c = b * 43,560*	*d*	*e = c * d*	*f = e / 43,560*
Residential:						
Single Fam Residential (6 - 8 DU/acre)	54%	0.54	23,522	$0.2434	$5,725	$0.1314
Multifamily HDR (30+ DU/acre)	84%	0.84	36,590	$0.2434	$8,906	$0.2044
Multifamily MDR (<30 DU/acre)	66%	0.66	28,750	$0.2434	$6,997	$0.1606
Non Residential:						
Retail	86%	0.86	37,462	$0.2434	$9,118	$0.2093
Hotel/Motel [2]	80%	0.80	34,848	$0.2434	$8,482	$0.1947
Office	80%	0.80	34,848	$0.2434	$8,482	$0.1947
Hospital	80%	0.80	34,848	$0.2434	$8,482	$0.1947
Schools	44%	0.44	19,166	$0.2434	$4,665	$0.1071
Church	80%	0.80	34,848	$0.2434	$8,482	$0.1947
Industrial	86%	0.86	37,462	$0.2434	$9,118	$0.2093
Parking lot [3]	86%	0.86	37,462	$0.2434	$9,118	$0.2093

Sources: DOU, EPS Storm_7

Notes:
[1] Table 5.6
[1] Uses the Office rate.
[2] Uses the Retail rate.

[3] User's Guide for the California Impervious Surface Coefficients, Office of Environmental Health Hazard Assessment, California Environmental Protection Agency, December 2010.

Table 5-8. Gravity Basins Zone Fee Calculation by Land Use per Gross Developable Acre and Square Foot

Gravity Basins Zone	ISC Standard By Land Use		Impervious Square Feet Per Gross Developable Acre	Fee Per Impervious Square Foot [1]	Fee Per Gross Developable Acre	Fee Per Gross Developable Square Foot
Land Use	As Percent	As Ratio				
formula:	*a*	*b*	*c = b * 43,560*	*d*	*e = c * d*	*f = e / 43,560*
Residential:						
Single Fam Residential (6 - 8 DU/acre)	54%	0.54	23,522	$0.1491	$3,508	$0.0805
Multifamily HDR (30+ DU/acre)	84%	0.84	36,590	$0.1491	$5,457	$0.1253
Multifamily MDR (<30 DU/acre)	66%	0.66	28,750	$0.1491	$4,287	$0.0984
Non Residential:						
Retail	86%	0.86	37,462	$0.1491	$5,586	$0.1282
Hotel/Motel [2]	80%	0.80	34,848	$0.1491	$5,197	$0.1193
Office	80%	0.80	34,848	$0.1491	$5,197	$0.1193
Hospital	80%	0.80	34,848	$0.1491	$5,197	$0.1193
Schools	44%	0.44	19,166	$0.1491	$2,858	$0.0656
Church	80%	0.80	34,848	$0.1491	$5,197	$0.1193
Industrial	86%	0.86	37,462	$0.1491	$5,586	$0.1282
Parking lot [3]	86%	0.86	37,462	$0.1491	$5,586	$0.1282

Sources: DOU, EPS Storm_8

Notes:
[1] Table 5.6
[1] Uses the Office rate.
[2] Uses the Retail rate.

The effective cost per square foot will be lower in most cases because of the application of credit for existing impermeable surfaces.

Use of Fees

Revenue from the proposed fees will be used to:

- Support storm drainage master planning.
- Participate in capital capacity improvements benefitting new growth and existing customers.
- Create new capacity solely benefitting to new growth.
- Improvements to common facilities that primarily include:
  - New pipes 36" or greater
  - Pipe upsizing
  - New detention basins
  - Capacity improvements at pump stations
  - New pump stations.

Funding for capacity improvements that benefit existing and new development must be shared in proportion to the impact new growth and existing parcels have on the system. Master Planning for those capital activities must also be shared. With two classes of basins, a proportional share must be defined for each basin type. The proportional share by basin class is shown on **Table 5-9**.

Table 5-9. Proportional Shares by Basin Type for Shared Projects

Basin Class		Acres	Proportionate Shares
Pumped Basins Zone	*formula*		
New Development	*b*	2,491	**7.60%**
Existing Development	*a*	30,299	**92.40%**
Totals	*c = a + b*	32,789	100.00%
Gravity Basins Zone			
New Development	*g*	1,046	**12.85%**
Existing Acres	*h*	7,089	**87.15%**
Totals	*i = g + h*	8,135	100.00%

Source: DOU and EPS Storm_9

Capital projects and Master Planning that benefit new growth exclusively can be funded entirely with fee revenue withing the related Zone.

Comparison with Surrounding Communities

The comparison of the Storm Drainage System fee with surrounding jurisdictions is shown on **Table 5-10**. The table includes a single-family land use and office and retail uses on a per 1,000 square foot basis and all of these land uses on a per acre basis. All comparisons assume greenfield development. Complete comparative information in chart form is presented as **Appendix E-1**, and high-level summaries are in **Chapter 1**, the **Executive Summary**.

Table 5-10. Fee Comparisons

Green Field Development Only	Site Area			Fee per Acre		
Jurisdiction	Single Family	Retail	Office	Single Family [1]	Retail	Office
	per unit	*per 1,000 sq. ft. [2]*				
Sacramento - Pumped	$818	$837	$556	$5,725	$9,118	$8,482
Sacramento - Gravity	$501	$513	$341	$3,508	$5,586	$5,197
Sacramento County - Uninc.	$2,994	$2,465	$1,761	$20,959	$26,844	$26,844
Folsom	$1,037	$579	$413	$7,259	$6,302	$6,302
Roseville	$279	$303	$216	$1,953	$3,298	$3,298
West Sacramento	$6,185	$5,446	$3,611	$43,294	$59,309	$55,061
Woodland	$1,362	$1,400	$1,000	$9,531	$15,248	$15,248
Average Excl. Sacramento	**$2,371**	**$2,039**	**$1,400**	**$16,599**	**$22,200**	**$21,351**
Sacramento						
Pumped +/- Percent of Average	**-66%**	**-59%**	**-60%**	**-66%**	**-59%**	**-60%**
Gravity +/- Percent of Average	**-79%**	**-75%**	**-76%**	**-79%**	**-75%**	**-76%**

Source: EPS *Storm_10*

Notes:
[1] Based on 7 units per acre.
[2] Comparisons for Retail and Office land uses are based on the assumption of a 1-acre parcel with a structure covering 25 percent of the parcel (i.e., a F.A.R of .25) for Retail, and 35 percent for Office. This construct is for comparative purposes only.

The proposed fees in Sacramento are exceptionally low compared with neighboring jurisdictions. This is due to the high level of asset depreciation, to the limited scope of assets that can be reasonably valued at this time, and to the exclusive use of the Buy-In approach, which is also the only feasible approach at this time.

Nexus Findings

For the Storm Drainage Utility, this section addresses the following requirements of the Mitigation Fee Act (California Government Code section 66000 et seq.) as it relates to the Storm Drainage System Utility and as discussed in **Chapter 5**, which is incorporated herein by reference.

Per California Government Code Section 66001

1. Identify the purpose of the fee.
2. Identify how the fee is to be used.
3. Determine how a reasonable relationship exists between the fee's use and the type of development project on which the fee is imposed.

4. Determine how a reasonable relationship exists between the need for the facility and the type of development project on which the fee is imposed.

5. Demonstrate a reasonable relationship between the amount of the fee and the cost of the facility or portion of the facility attributable to the development on which the fee is impose.

The Storm Drainage Development Impact Fee differs by two zones (Zones), or subcomponents: one for gravity-dependent basins and one for pump-dependent basins. The fee Zones are legally, financially, and functionally independent of, and shielded from each other in the administration of the fee, to include the collection, accounting and use of funds.

1. Purpose of the Fee

The purpose of the Storm Drainage Development Impact Fee for each Zone is to fund storm drainage infrastructure and facilities within the respective Zone that are needed to maintain or improve the level of service as growth occurs to convey, contain, and discharge to the public drainage system stormwater generated by new residential and commercial development within the respective Zone of the Storm Drainage Utility Service Area (Area).

2. Use of Fee

The Storm Drainage Development Impact Fee for each Zone will be used to fund capital improvements within the respective zones to the storm drainage system consisting of master planning and the improvement or construction of new storm drainage facilities needed to collect, contain, and discharge to the public drainage system stormwater generated within the respective Zone.

3. Reasonable Relationship between Use of Fee and Type of Development on Which the Fee is Imposed

The Storm Drainage Development Impact Fee for each Zone will be used exclusively for the benefit of the Zone in which it is collected to fund the storm drainage facilities as described in this chapter, **Chapter 5**, in each respective Zone. New residential and nonresidential development in the Zones will generate more stormwater runoff by creating additional impervious surface area, generating the need for facilities that collect, contain, and discharge stormwater.

A reasonable relationship therefore exists between the use of the Storm Drainage Development Impact Fee and the type of development on which the fee is imposed because the fee will be used to construct new or improved storm drainage facilities that collect, contain, and discharge to the public storm drainage system stormwater runoff generated by the residential and nonresidential development.

4. Reasonable Relationship between Need for Facility and Type of Project on Which the Fee is Imposed

Development of residential and nonresidential properties will increase impervious surface area and associated storm water runoff, unless these properties have no new impervious surface, in which case the fee is waived. Storm drainage facility needs are established pursuant to the City of Sacramento Department of Utilities Capital Project and Master Planning process that establishes the drainage facilities needed to collect, contain, and discharge storm water based on the land uses anticipated to develop in the respective Zones. Specific requirements, or standards, are established by the Design and Procedures Manual which requires that City drainage improvements shall be designed to:

- Meet the needs of a growing community.
- Provide a minimum 100 Year Event protection to structures.
- Provide a minimum 10 Year Event protection to streets.
- Control urban runoff pollutants.
- Avoid public safety hazards.

A reasonable relationship therefore exists between the need for storm drainage facilities and new residential and nonresidential projects with net new impervious surfaces on which the Storm Drainage Development Impact Fee is imposed on a square foot basis. This is because each project that creates new impervious surface area will generate additional storm water runoff, and the storm drainage facilities are necessary to collect, contain, and discharge this level of increased storm water runoff in compliance with established standards of service.

5. Reasonable Relationship between Amount of Fee and Cost of Facilities or Portion of Facilities Attributed to Development on Which Fee is Imposed

As a Buy-In fee, the total current value of storm drainage facilities is divided by the total estimated impervious surface in the entire City of Sacramento to derive the current value per impervious square foot of each type of drainage system (pumped or gravity). The fee applies to any new, measured impervious square foot, as determined through the plan review process, that is not mitigated on site.

Collected fees will be used for improvements on a proportional match basis as specified in **Chapter 5** or used to construct new facilities that exclusively benefit new growth.

The Storm Drainage Development Impact Fee in each Zone does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. Future, periodic updates to the Storm Drainage Development Impact Fee will re-evaluate the costs expended and future needs and costs to ensure that the fee has not and does not exceed the estimated reasonable cost of providing appropriate capital improvement services.

Finding on the Administrative Component: The administrative cost portion of the Storm Drainage System Development Impact Fee (Administration Fee) does not exceed the estimated reasonable cost of providing the service for which the fee or charge is imposed. The Administration Fee funds City costs associated with fee program administration and implementation including collection and accounting, annual reporting, capital planning, periodic updates to the Separated Sewer System Development Impact Fee, and other related costs.

Per California Government Code Section 66016.5 (AB 602)

Most requirements of the legislation are met in the findings for 66001. Those that are not yet addressed are as follows:

1. Exception requirement to the housing square footage basis:

d) An explanation as to why square footage is not an appropriate metric to calculate fees imposed on a housing development project.

e) An explanation that an alternative basis of calculating the fee bears a reasonable relationship between the fee charged and the burden posed by the development.

f) That other policies in the fee structure support smaller developments, or otherwise ensure that smaller developments are not charged disproportionate fees.

The findings for the exception are as follows:

d) An explanation as to why square footage is not an appropriate metric to calculate fees imposed on a housing development project.

New imperious surfaces drive the demand for drainage facilities. In housing developments, new impervious surfaces incorporate the footprint on a parcel, capturing ground floor living spaces as well as driveways, sidewalks, patios and other such surfaces. A square footage of proposed-units basis would introduce inequities. For example, a two-story home with the same footprint as a single-story home would pay twice the fee while causing an identical impact on the drainage system. This inequity would be amplified in multistory apartment and condominium buildings or towers.

b) An explanation that an alternative basis of calculating the fee bears a reasonable relationship between the fee charged and the burden posed by the development.

For storm water runoff, the standard, customary and equitable method to establish a reasonable relationship between the fee charged, the facilities required, and the type of development on which the fee is imposed is with a direct

measure of new impermeable surfaces. The current plan review process requires the identification of new impermeable square feet. New runoff as a result of development establishes the demand for new or improved capacity, the cost of which is the basis of the fee.

c) That other policies in the fee structure support smaller developments, or otherwise ensure that smaller developments are not charged disproportionate fees.

A fee basis of impermeable square footage ensures equity for the allocation of the cost of the impact from development. The fee is proportional to the impact caused by new impermeable surfaces. Smaller developments with identical unit footprints will have the same fees. Smaller footprints will have proportionately lower fees. Similarly, multifamily apartment buildings and towers will have lower impacts and fees on a per unit basis as the size of the units decline and/or the number of floors increase.

2. Capital improvement plan requirement as part of a nexus study:

Capital improvements funded by the Storm Drainage System Development Impact Fee are limited to the amounts and purposes as described in the **66001** findings and **Chapter 5**. Project master planning and programming are carried out as part of the annual budget process.

APPENDICES

APPENDIX A:

Executive Summary

Appendix A-1: Square Feet per Employee Coefficients

Appendix A-2: Companion Charts to Tables 1-5 and 1-6

Appendix A-1

Square Feet per Employee Coefficients

Table A-1a Coefficients for Square Feet per Employee-All Nonresidential Land Uses

Land Use	Square Feet per Employee
Education	700
Food	600
Government	500
Office	200
Retail	450
Services	500
Medical	350
Industrial	1,000

Source: BAE

Note:
[1] Sacramento General Plan Update, Existing Conditions Technical Memorandum: Market Demand Study, Bay Area Economics July, 2019.

Appendix A-2

Companion Charts to Table Sets 1-5 and 1-6.

Chart to Table 1-5a

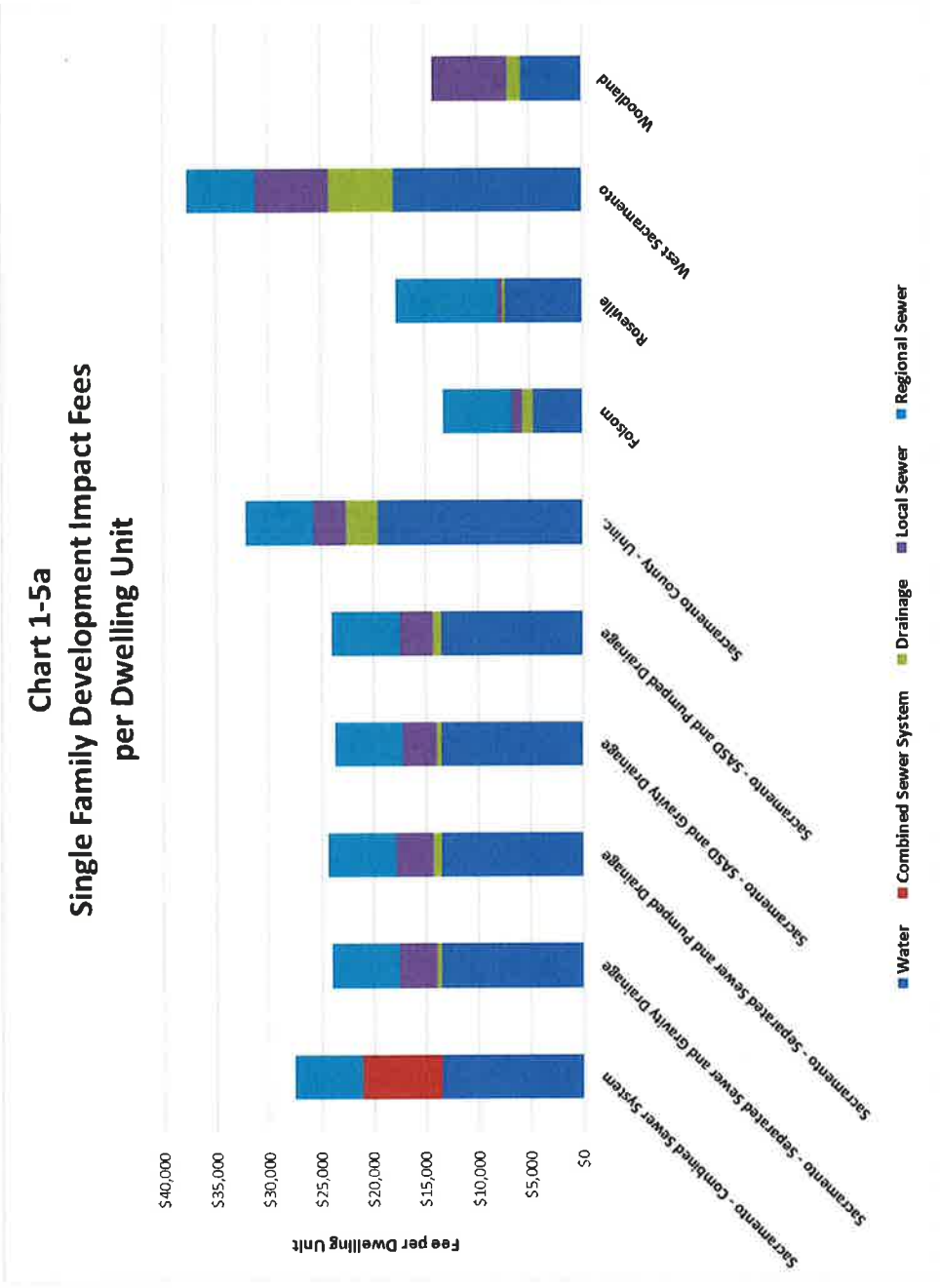


Chart to Table 1-5b

Chart 1-5b
Retail Development Impact Fees per 1,000 Building Square Feet

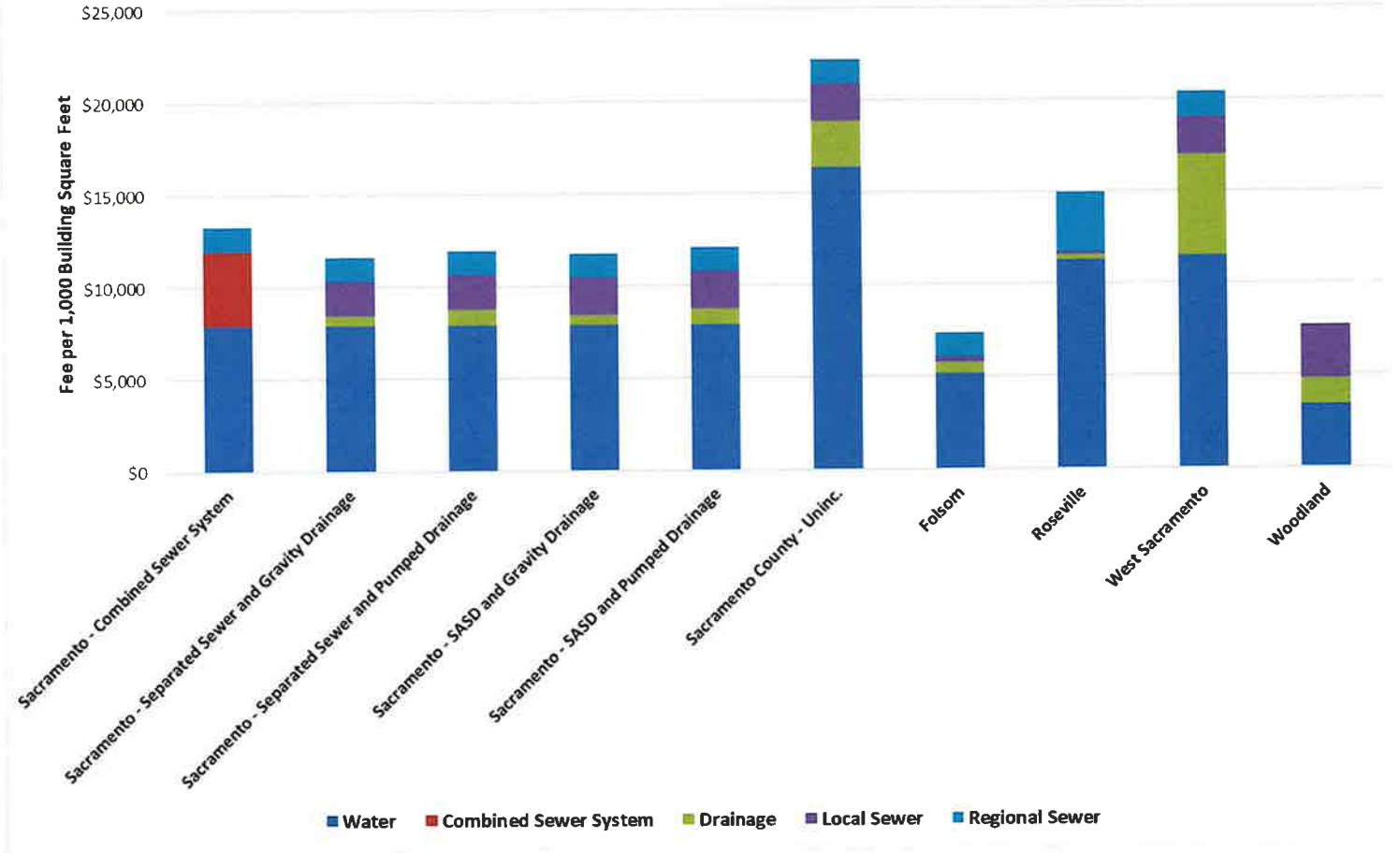


Chart to Table 1-5c

Chart 1-5c
Office Development Impact Fees
per 1,000 Building Square Feet

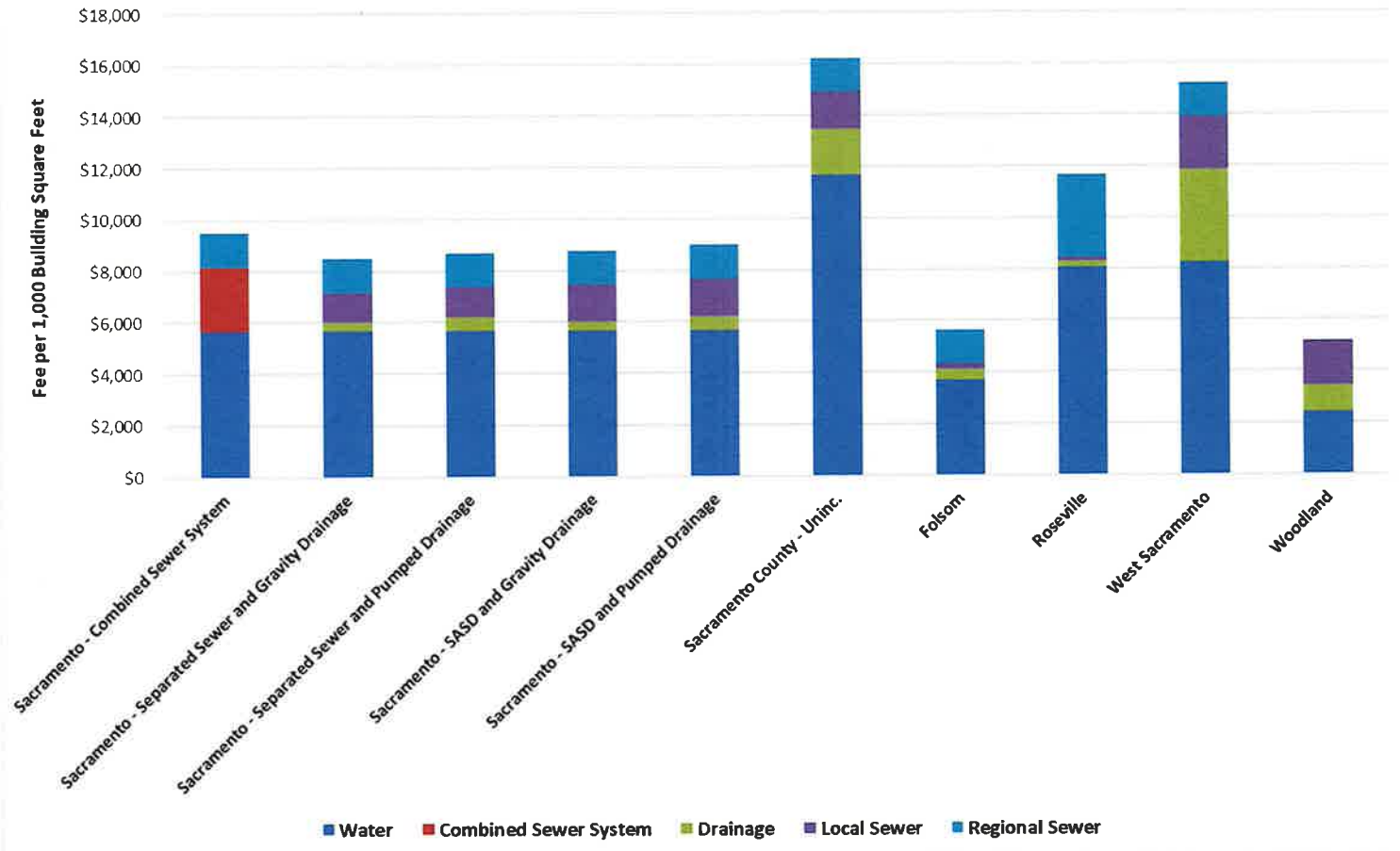


Chart to Table 1-6a

Chart 1-6a
Single Family Development Impact Fees per Acre

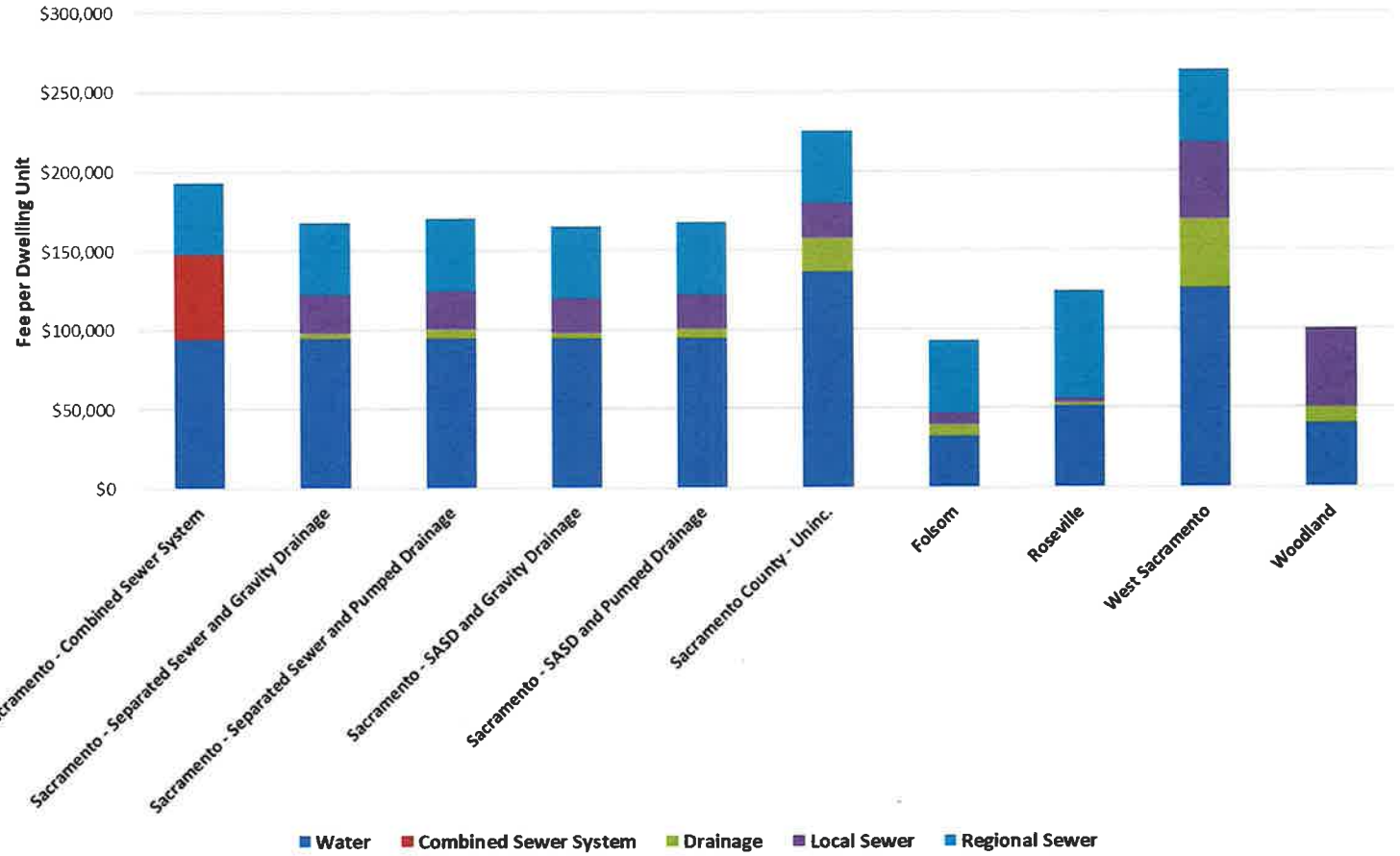


Chart to Table 1-6b

Chart 1-6b
Retail Development Impact Fees per Acre

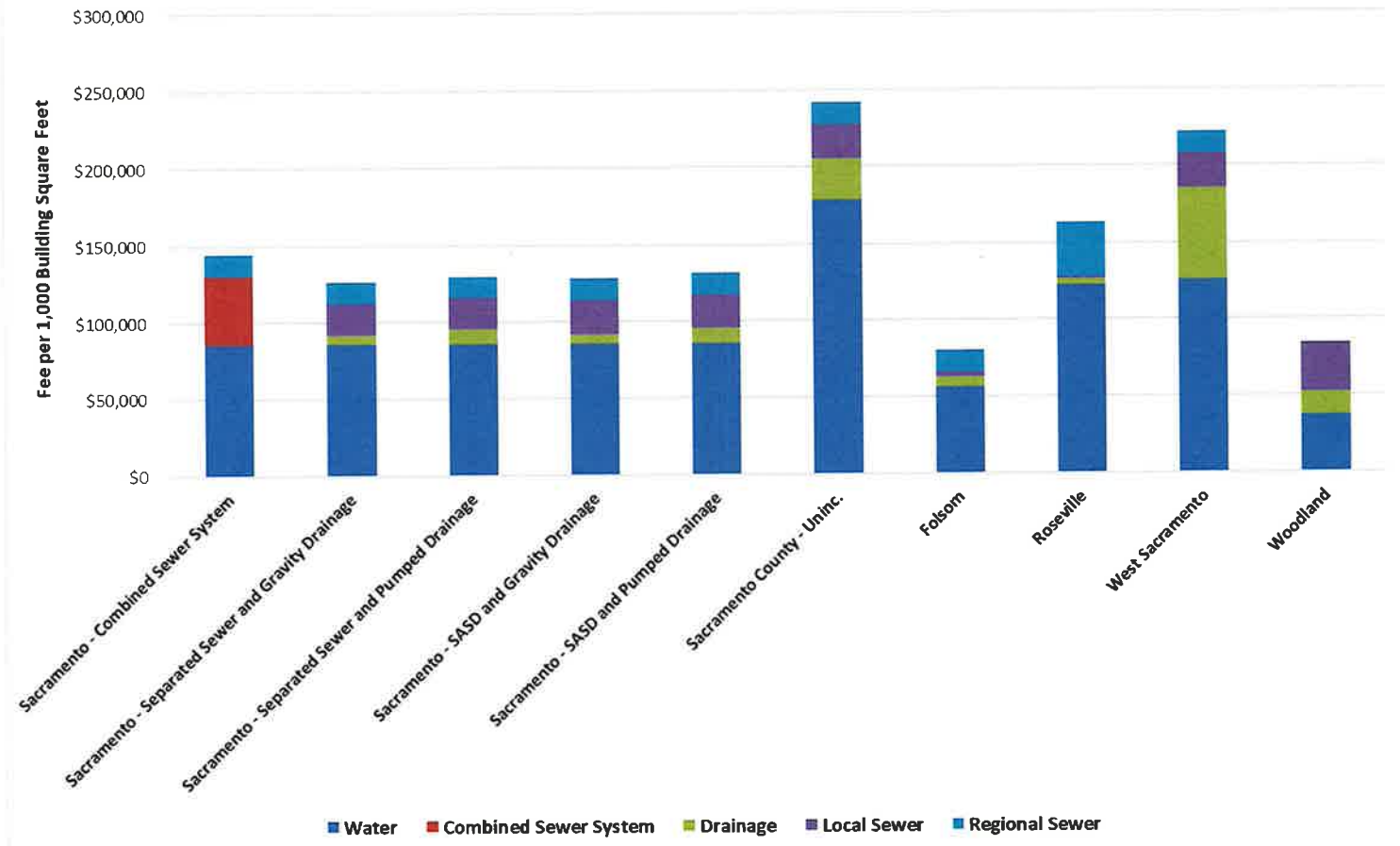
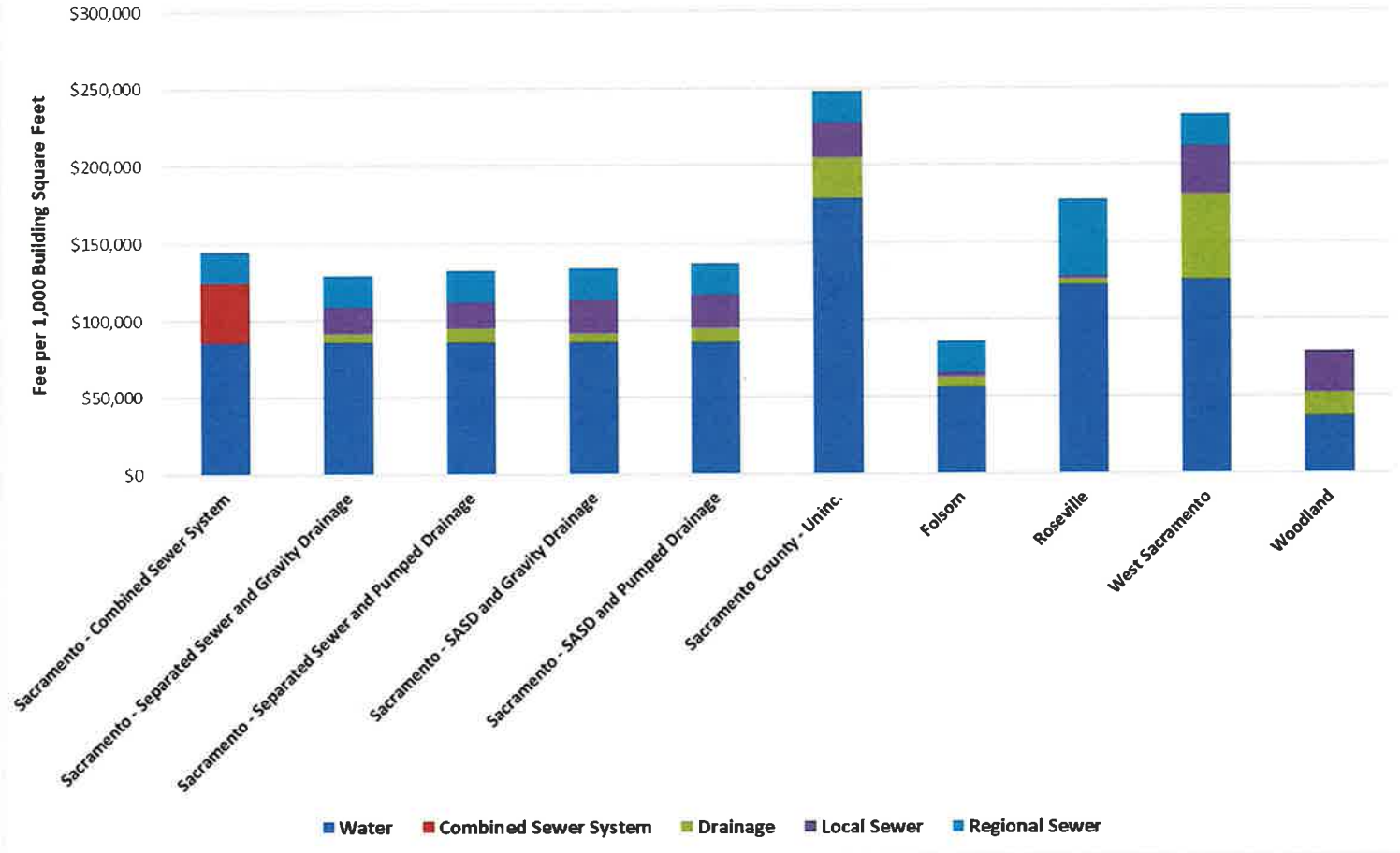


Chart to Table 1-6c

Chart 1-6c
Office Development Impact Fees per Acre



APPENDIX B:

Water System Utility

Appendix B-1: Water System Asset Analyses

Appendix B-2: Capital Improvement Program

Appendix B-3: Companion Charts to Tables 2-10 and 2-11

Appendix B-1

Water System Asset Analyses

Treatment Plants

DIF SUPPORT PROJECT – WATER TREATMENT PLANTS
CITY OF SACRAMENTO DEPARTMENT OF UTILITIES

Basis of Estimate

Introduction

To support the City's efforts in determining the value of their drinking water system, Carollo Engineers prepared an estimate of probable cost to construct and remaining useful life for existing facilities at the Sacramento River Water Treatment Plant (WTP) and the E.A. Fairbairn WTP. Estimates were prepared based on historical and engineering data available along with parametric cost parameters and professional engineering judgement. The purpose of this document is to describe in sufficient detail the methodology and assumptions used to prepare the estimates.

This memorandum describes:

1. WTP Value Estimates
2. Methodology
3. Class of Estimates
4. Reference Documents
5. Evaluation Assumptions
6. Indirect and Soft Costs

Attachments:

- Value Estimate Table for each water treatment plant

WTP Value Estimates

The estimated current WTP values are:

- Sacramento River WTP - $750,300,000
- E.A. Fairbairn WTP - $482,000,000

Tables with major estimated facility values for each plant are attached.

Methodology

All known major facilities in use at the two water treatment plants were included in the effort. For each major facility the following information was developed to arrive at a current estimate of value:

- Facility Name
- Approximate Year of Construction
- Expected Useful Life
- Estimated Cost to Construct Facility in January of 2022

The estimated cost to construct is to re-construct the named facility (i.e. replace with a similar structure.) This cost does not include efforts to bring the facility up to current code requirements, performance criteria, or City planning and policy standards. With this information developed, as directed by the City, a straight line depreciation method was used to discount the cost to construct the facility if built in January 2022 by the ratio of remaining useful life to total expected useful life to arrive at each estimated current facility value.

Class of Estimate

This estimate was prepared in general accordance with the guidance established by the Association for the Advancement of Cost Engineering (AACE) and as such could be described as a Class 5 estimate. This level of estimate may have an accuracy range of -50% to +100%. For most costs parametric estimating was used, evaluating the facilities by their size multiplied by a unit cost. In some instances, recently developed cost estimates for the City's Water+ Program were used as the basis and modified accordingly to account for minor differences between the planned new Water+ facilities and the existing facilities. Any previous cost estimates used as a basis were escalated to January 2022 dollars using a standardized approach utilized by the Department of Utilities, based on national and local ENR cost indices, and do not include escalation to mid-point of future construction.

In early 2020 the construction community and vendor network that supports the water/wastewater industry experienced significant disruptions due to COVID-19 restrictions adding new and significant complexity to their operations, labor force management, and material supply chain. This has created a bidding environment that has been and remains very difficult to predict. Throughout the second half of 2020 and all of 2021 there have been extraordinary cost increases in key materials commonly required by plant and pipeline projects and increased pressures on attracting and retaining quality craft labor. Additionally, increasing fuel costs and massive congestion at the nation's ports and rail yards combined with near record low warehouse and trucking capacity have raised shipping prices to levels that far exceed historical norms. It is clear by reviewing bid results for projects procured during this period that prices have increased at a rate that far exceeds long-term escalation trends and the variability between bidders has increased making the pricing process more difficult to predict.

The construction outlook for 2022 retains many of the same concerns as the previous two years while also incorporating new ones. Even though the primary risks regarding the health and safety of the population due to the threat of COVID-19 and its variants appear to be diminishing and the corresponding restrictions on businesses are slowly being lifted, many of the challenges created by these past actions remain unresolved. Political events, economic policies, global trade disruptions, supply chain delays, fierce competition for labor, consumer inflation, rising fuel prices, and war have all created uncertainties that have impacted contractor pricing.

Consumers of construction cost estimate data should be advised that pricing accuracy is time sensitive and will degrade over relatively brief periods of time. Pricing updates should be made regularly to increase overall reliability.

Reference Documents

The following data comprise the design basis for the estimate:

- Sacramento River Water Treatment Plant Design Drawings from all major historical projects
- E.A. Fairbairn Water Treatment Plant Design Drawings from all major historical projects
- Water+ Program Planning Level Cost Estimates
- DOU Excel Spreadsheet titled, "SMF ENR Indices_Jan22"

Evaluation Assumptions

The evaluations were performed with the following assumptions:

1. Civil/site and electrical and I&C work were estimated as a percentage of the sum of the facility costs and discounted by a composite estimate of age of the major work.
2. Some parametric costs were developed by scaling from similar facilities. Scaling factors included size (footprint), volume (gallons), capacity (million gallons per day), and estimated complexity.
3. Facilities not in serviceable condition were not included in the evaluation.

Indirect and Soft Costs

Indirect costs have been included in the parametric cost estimate values for each major facility. Indirect costs are those costs added to the direct burdened labor, materials, subcontract, construction equipment, and other direct costs to better represent a general contractor's price. Indirect costs can include:

- Local Sales Tax
- State Sales Tax
- General Subcontractor General Conditions, Overhead and Profit
- Specialty Subcontractor General Conditions, Overhead and Profit
- Self-Perform Management
- Builder's Risk & General Liability Insurance Premiums
- General Contractor Overhead & Profit
- Payment and Performance Bond Premium

Consistent with typical Level 5 cost estimates, we have included a contingency of 35% to account for those items not specifically captured in such a high-level estimate. The contingency reflects an amount added to the cost estimate to accommodate costs that may result from design changes, items not fully itemized in the estimate, errors or omissions in the estimate, or unpredictable conditions or risks that experience shows are likely to occur during the design or bidding phase of the project. The contingency does not encompass increases in scope of the project, unforeseen market conditions, or changes during construction.

Soft costs, including engineering, legal, and admin have been estimated at 25% of the construction (direct and indirect) cost. This cost is calculated from each plant subtotal.

SACRAMENTO RIVER WTP

6/27/2022

Project # 11982A.10
Client: City of Sacramento
Date: 6/20/2022
Current \ 2022

Area No.	Facility	Size	Size Unit	Unit Construction Cost in 2022	Cost Unit	Construction Cost in 2022 Dollars	Installation Year	Age (yr)	Life Expectancy (yr)	Current Value in 2022 Dollars	Notes on Cost
15	Filter Waste Washwater Lagoons	48,000	sq.ft	$96,400,000	per sq.ft	$6,400,000	2004	18	50	$4,100,000	$60/ft^2 concrete + $3M equipment (escalated to Jan 2022 from 2021 cost estimate)
16	Sludge Lagoons	96,000	sq.ft	$65.17	per sq.ft	$6,300,000	2004	18	50	$4,000,000	$60/ft^2 (escalated from to Jan 2022 from 2021 cost estimate)
17	Sludge Drying Bed	105,349	sq.ft	$10.00	per sq.ft	$1,100,000	2015	7	20	$700,000	
18	Gravity Thickeners	-	-	$10,300,000	LS	$10,300,000	2015	7	50	$8,900,000	Based on Water+ Costs (escalated to Jan 2022 from 2021)
19	Dewatering Building	-	-	$30,400,000	LS	$30,400,000	2015	7	35	$24,300,000	Based on Water+ Costs (escalated to Jan 2022 from 2021)
20	Intake No. 1	-	-	$90,100,000	LS	$90,100,000	2002	20	50	$54,100,000	Based on Water+ Costs (escalated to Jan 2022 from 2021)
30	Grit Basins	861,696	gal	$8.00	per gal	$6,900,000	2004	18	50	$4,400,000	
	Floc-Sed Basin (No. 1-2)	-	-	$32,400,000	LS	$32,400,000	2004	18	75	$24,800,000	Cost based on 2013 SRWTP Rehab Estimate (escalated to Jan 2022 from 2015)
41	Floc-Sed Basin (No. 3-4)	-	-	$32,400,000	LS	$32,400,000	2015	7	75	$29,400,000	Cost based on 2013 SRWTP Rehab Estimate (escalated from 2015)
51	Filters (No. 1-8)	-	-	$39,100,000	LS	$39,100,000	2004	18	75	$29,700,000	Based on Water+ Costs (escalated to Jan 2022 from 2021)
	Filters (No. 9-16)	-	-	$39,100,000	LS	$39,100,000	2015	7	75	$35,500,000	Based on Water+ Costs (escalated to Jan 2022 from 2021)
61	Ct No. 1 / Clearwell	7,000,000	gal	$6.50	per gal	$45,500,000	2004	18	75	$34,600,000	
62	9.5 MG Reservoir	9,500,000	gal	$5.00	per gal	$47,500,000	1931	91	75	$0	
63	5 MG Reservoir	5,000,000	gal	$5.00	per gal	$25,000,000	1921	101	75	$0	
71	High Service Pump Station	-	-	$40,000,000	LS	$40,000,000	2015	7	50	$34,400,000	Cost based on 2013 SRWTP Rehab Estimate (escalated to Jan 2022 from 2015)
81	Coagulant Building	7,351	sq.ft	$500	per sq.ft	$3,700,000	1922	100	75	$0	
82	Chemical Bulk Storage & Feed North	10,127	sq.ft	$800	per sq.ft	$8,100,000	2004	18	50	$5,200,000	
92	Operations Building	22,136	sq.ft	$600	per sq.ft	$13,300,000	2004	18	75	$10,100,000	
94	Maintenance Building	5,654	sq.ft	$250	per sq.ft	$1,400,000	1982	40	40	$0	
98	Plant Elec Substation	-	-	$8,800,000	LS	$8,800,000	2015	7	50	$7,700,000	Cost based on 2013 SRWTP Rehab Estimate (escalated to Jan 2022 from 2015)
	Utilidoor	-	-	$10,000,000	LS	$10,000,000	2004	18	50	$6,400,000	
	Misc. Civil Costs	-	-	$100,000,000	LS	$100,000,000	2004	18	75	$75,000,000	
	Land Purchase	-	-	$0.00		$0				$0	
	Generator	-	-	$3,700,000	LS	$3,700,000	2015	7	20	$2,400,000	Cost based on 2013 SRWTP Rehab Estimate (escalated to Jan 2022 from 2015)
	SUBTOTAL					**$501,600,000**				**$396,600,000**	
				EI&C		$120,300,000	2004	18	30	$48,100,000	20% of Subtotal
				SUBTOTAL		**$721,900,000**				**$444,600,000**	
				Contingency		$252,700,000				$155,600,000	35% of Subtotal
				TOTAL CONSTRUCTION COST		**$974,600,000**				**$600,200,000**	
				Engineering, Legal, & Admin		$243,700,000				$150,100,000	25% of Total Construction Cost
				TOTAL PROJECT COST		**$1,218,300,000**				**$750,300,000**	

E.A. FAIRBAIRN WTP

6/27/2022

Project #: 11862A.10
Client: City of Sacramento
Date: 6/20/2022
Current Yes 2022

Area No.	Facility	Size	Size Unit	Unit Construction Cost in 2022	Cost Unit	Construction Cost in 2022 Dollars	Installation Year	Age (yr)	Life Expectancy (yr)	Current Value in 2022 Dollars	Notes on Cost
8	Fluoride Tanks	-	-	$2,000,000	LS	$2,000,000	2018	4	20	$1,600,000	
15	Iller Waste Wastewater Lagoons (No. 1 & 2	48,800	sq.ft	$8,300,000	per sq.ft	$8,300,000	2004	18	50	$4,000,000	$80/ft^3 concrete + $3M equipment (escalated to Jan 2022 from 2021 cost estimate)
16	Sludge Lagoons (No. 1,2,&3)	100,877	sq.ft	$65.17	per sq.ft	$6,600,000	2004	18	50	$4,200,000	$80/ft^3 (escalated from to Jan 2022 from 2021 cost estimate)
18	Gravity Thickeners	-	-	$7,200,000	LS	$7,200,000	2015	7	50	$6,200,000	70% of SRWTP Gravity Thickeners cost
19	Dewatering Building	-	-	$22,800,000	LS	$22,800,000	2015	7	35	$18,200,000	75% of SRWTP Dewatering Building cost
20	Intake	-	-	$48,300,000	LS	$48,300,000		37.5	60	$12,100,000	54% of SRWTP Intake No. 1 cost
31	Grit Basins	286,700	gal	$16.00	per gal	$4,600,000	1964	58	50	$0	Cost factored for levy work
	Floc-Sed Basins (No. 1 & 2)	-	-	$29,100,000	LS	$29,100,000	1964	58	75	$8,600,000	90% of SRWTP Floc-Sed Basin (No. 1-2) cost
41	Floc-Sed Basins (No. 3 & 4)	-	-	$29,100,000	LS	$29,100,000	2005	17	75	$22,500,000	90% of SRWTP Floc-Sed Basin (No. 3-4) cost
	Filters (No. 1-6)	13,936	sq.ft	$4,000	per sq.ft	$55,700,000	1964	58	75	$12,600,000	
51	Filters (No. 9-16)	12,544	sq.ft	$5,000	per sq.ft	$62,700,000	2005	17	75	$48,500,000	
61	CT Basin / 6 MG Reservoir	6,000,000	gal	$6.50	per gal	$39,000,000	2005	17	75	$30,200,000	
62	20 MG Reservoir	20,000,000	gal	$3.00	per gal	$60,000,000	1964	58	75	$13,600,000	Cost factored for hopper bottom
63	High-Service Pump Station	-	-	$34,800,000	LS	$34,800,000	1964	58	50	$0	87% of SRWTP High Service Pump Station cost
64	Plant Electrical Substation	-	-	$8,900,000	LS	$8,900,000	1964	58	50	$0	100% of SRWTP Plant Elec Substation cost
82	Chemical Building	17,850	sq.ft	$800	per sq.ft	$14,100,000	2005	17	50	$9,300,000	
83	Lime Building	2,134	sq.ft	$1,000	per sq.ft	$2,100,000	2006	17	50	$1,400,000	
81	Laboratory	11,700	sq.ft	$1,500	per sq.ft	$17,600,000	1985	37	40	$1,200,000	
91	Operations Building (Headhouse)	14,963	sq.ft	$800	per sq.ft	$12,000,000	1964	58	50	$0	
92	Maintenance & Control Building	7,105	sq.ft	$800	per sq.ft	$5,700,000	2004	18	50	$3,600,000	
93	Maintenance & Storage Building	1,181	sq.ft	$250	per sq.ft	$300,000	2010	12	40	$200,000	
94	Maintenance Shop	2,475	sq.ft	$250	per sq.ft	$600,000	2010	12	40	$400,000	
95	Maintenance Warehouse	234	sq.ft	$250	per sq.ft	$100,000	2010	12	40	$100,000	
	Utilidoor	-	-	$1,500,000	LS	$1,500,000	1964	58	50	$0	
	Misc. Civil Costs	-	-	$60,000,000	LS	$60,000,000	2005	17	75	$46,400,000	
	Land Purchase	-	-	$0.00		$0				$0	
	Generator	-	-	$2,000,000	LS	$2,000,000		20	20	$0	
	SUBTOTAL					**$632,900,000**				**$243,000,000**	
				EI&C		$106,600,000	2004	18	30	$42,600,000	20% of Subtotal
				SUBTOTAL		**$839,600,000**				**$285,600,000**	
				Contingency		$223,800,000				$100,000,000	35% of Subtotal
				TOTAL CONSTRUCTION COST		**$863,300,000**				**$385,600,000**	
				Engineering, Legal, & Admin		$215,800,000				$96,400,000	25% of Total Construction Cost
				TOTAL PROJECT COST		**$1,079,100,000**				**$482,000,000**	

DIF SUPPORT PROJECT – RESERVOIRS
CITY OF SACRAMENTO DEPARTMENT OF UTILITIES

Basis of Estimate

Introduction

To support the City's efforts in determining the value of their drinking water system, Carollo Engineers prepared an estimate of probable cost to construct and remaining useful life for the existing potable water distribution system reservoirs. Estimates were prepared based on historical and engineering data available along with parametric cost parameters and professional engineering judgement. The purpose of this document is to describe in sufficient detail the methodology and assumptions used to prepare the estimates.

This memorandum describes:

1. Reservoir Estimates
2. Methodology
3. Class of Estimates
4. Reference Documents
5. Evaluation Assumptions
6. Indirect and Soft Costs

Attachments:

- Reservoir Value Estimate Table

Reservoir Value Estimates

The estimated current value of the potable water distribution system reservoirs is estimated at $127,100,000. Additional cost estimate development information for each reservoir is provided in the attached table.

Methodology

For each distribution system reservoir the following information was developed to arrive at a current estimate of value:

- Facility Name
- Approximate Year of Construction
- Expected Useful Life
- Estimated Cost to Construct Facility in January of 2022

The estimated cost to construct is to re-construct the reservoir and pump station, if applicable (i.e. replace with a similar facility.) This cost does not include efforts to bring the facility up to current code requirements, performance criteria, or City planning and policy standards. With this information developed, as directed by the City, a straight line depreciation method was used to discount the cost to

construct each reservoir if built in January 2022 by the ratio of remaining useful life to total expected useful life to arrive at each estimated current reservoir value.

Class of Estimate

This estimate was prepared in general accordance with the guidance established by the Association for the Advancement of Cost Engineering (AACE) and as such could be described as a Class 5 estimate. This level of estimate may have an accuracy range of -50% to +100%. For most costs parametric estimating was used, evaluating the facilities by their size multiplied by a unit cost. Any previous cost estimates used as a basis were escalated to January 2022 dollars using a standardized approach utilized by the Department of Utilities, based on national and local ENR cost indices, and do not include escalation to mid-point of future construction. The one exception is the Shasta Reservoir, which the City estimated its current construction cost in 2022 dollars through the ENR 20-City Cost Index.

In early 2020 the construction community and vendor network that supports the water/wastewater industry experienced significant disruptions due to COVID-19 restrictions adding new and significant complexity to their operations, labor force management, and material supply chain. This has created a bidding environment that has been and remains very difficult to predict. Throughout the second half of 2020 and all of 2021 there have been extraordinary cost increases in key materials commonly required by plant and pipeline projects and increased pressures on attracting and retaining quality craft labor. Additionally, increasing fuel costs and massive congestion at the nation's ports and rail yards combined with near record low warehouse and trucking capacity have raised shipping prices to levels that far exceed historical norms. It is clear by reviewing bid results for projects procured during this period that prices have increased at a rate that far exceeds long-term escalation trends and the variability between bidders has increased making the pricing process more difficult to predict.

The construction outlook for 2022 retains many of the same concerns as the previous two years while also incorporating new ones. Even though the primary risks regarding the health and safety of the population due to the threat of COVID-19 and its variants appear to be diminishing and the corresponding restrictions on businesses are slowly being lifted, many of the challenges created by these past actions remain unresolved. Political events, economic policies, global trade disruptions, supply chain delays, fierce competition for labor, consumer inflation, rising fuel prices, and war have all created uncertainties that have impacted contractor pricing.

Consumers of construction cost estimate data should be advised that pricing accuracy is time sensitive and will degrade over relatively brief periods of time. Pricing updates should be made regularly to increase overall reliability.

Reference Documents

Reservoir information was gathered from the following electronic files, provided by DOU:

- City of Sacramento, Water Master Plan, July 2013, Chapter 5, West Yost.
- Condition Assessment Water Storage Facilities, Condition Assessment Recommendations Report, July 9, 2018, Stantec.
- Excel Spreadsheet titled "Shasta Cost Analysis_2022-05-06 updates for DIF **.xlsx.
- Reservoirs.kmz Google Earth file indicating reservoir names and locations.

- DOU Excel Spreadsheet titled, "SMF ENR Indices_Jan22"

Evaluation Assumptions

The evaluations were performed with the following assumptions:

1. For ground storage reservoirs and buried reservoirs, associated pump stations were included in the reservoir cost as appropriate.
2. Some parametric costs were developed by scaling from similar facilities. Additional factors were applied in some cases to account for variation in project estimated complexity.
3. Life expectancy was estimated based on industry average. Actual condition and any maintenance programs were not accounted for.
4. EI&C costs have been included in the value of the reservoirs and is not shown separately as a percentage of the subtotal.

Indirect and Soft Costs

Indirect costs have been included in the parametric cost estimate values for each reservoir. Indirect costs are those costs added to the direct burdened labor, materials, subcontract, construction equipment, and other direct costs to better represent a general contractor's price. Indirect costs can include:

- Local Sales Tax
- State Sales Tax
- General Subcontractor General Conditions, Overhead and Profit
- Specialty Subcontractor General Conditions, Overhead and Profit
- Self-Perform Management
- Builder's Risk & General Liability Insurance Premiums
- General Contractor Overhead & Profit
- Payment and Performance Bond Premium

Consistent with typical Level 5 cost estimates, we have included a contingency of 35% to account for those items not specifically captured in such a high-level estimate. The contingency reflects an amount added to the cost estimate to accommodate costs that may result from design changes, items not fully itemized in the estimate, errors or omissions in the estimate, or unpredictable conditions or risks that experience shows are likely to occur during the design or bidding phase of the project. The contingency does not encompass increases in scope of the project, unforeseen market conditions, or changes during construction.

Soft costs, including engineering, legal, and admin have been estimated at 25% of the construction (direct and indirect) cost. This cost is calculated from the reservoir subtotal.

RESERVOIRS

6/27/2022

Job: 11602A.10
Client: City of Sacramento
Current Year: 2022

Reservoir Name	Storage Type	Diameter (ft)	Unit Sidewater Depth (gal/ft)	Low Water Elevation (ft)	Overflow Elevation (ft)	Storage Capacity (MG)	Unit Construction Cost in 2022 Dollars	Cost Unit	Construction Cost in 2022 Dollars	Year Installed	Age (yr)	Life Expectancy (yr)	Current Value in 2022 Dollars	Notes on Cost
Alhambra	Elevated Concrete	144	121,081	100	125	3	$6.00	per gal	$18,000,000	1962	60	75	$3,600,000	Cost for Cast-in-Place tank with added for elevated construction and steel liner
Capitol Gateway	Ground Steel	143	120,133	15	40.5	3	$8,200,000	LS	$8,200,000	1991	31	50	$3,100,000	West Sacramento Bridge District Project- 2011 3MG Tank and PS for $5.8M
City College	Elevated Concrete	144	121,081	100	125	3	$6.00	per gal	$18,000,000	1962	60	75	$3,600,000	Cost for Cast-in-Place tank with added for elevated construction and steel liner
El Centro	Ground Steel	150	132,192	23	48	3	$8,200,000	LS	$8,200,000	2000	22	50	$4,600,000	West Sacramento Bridge District Project- 2011 3MG Tank and PS for $5.8M
Elkhorn	Ground Concrete	180	98,538	16	48	3	$3.00	per gal	$9,000,000	2008	14	75	$7,300,000	Shasta unit cost plus premium for volume reduction
Florin	Buried Concrete	Varies	Varies	9.5	32	15	$5.00	per gal	$75,000,000	1970	52	75	$23,000,000	Shasta Cost Plus Adjustment for Buried and Cast-in-Place
Freeport	Elevated Steel	Varies	Varies	90	125	3	$14,000,000	LS	$14,000,000	1960	62	50	$0	Cost from Marshall & Swift Cost Guide, extrapolated from 2MG Low-Stress Area Elevated Steel Tank in 2010 $, 40% premium added for current labor and safety requirements to construct
Riverside	Partially Buried	154	137,710	8.2	29	3	$4.00	per gal	$12,000,000	1962	60	75	$2,400,000	$10.7M from DOU Cost Estimate for Shasta plus adjustment for partially buried
Robla	Ground Steel	150	132,182	37	62	3	$8,200,000	LS	$8,200,000	1988	34	50	$2,600,000	West Sacramento Bridge District Project- 2011 3MG Tank and PS for $5.8M
San Juan	Buried Concrete	180	148,841	0	25	3	$5.00	per gal	$15,000,000	2004	18	75	$11,400,000	Shasta Cost Plus Adjustment for Buried and Cast-in-Place
UC Medical Center	Elevated Concrete	144	121,081	100	125	3	$6.00	per gal	$18,000,000	1962	60	75	$3,600,000	Cost for Cast-in-Place tank with added for elevated construction and steel liner
Shasta	Ground Concrete					4	$2.68	per gal	$10,700,000	2018	4	75	$10,100,000	$10.7M from DOU Cost Estimate
							Land Purchase		$0				$0	
							SUBTOTAL		**$214,300,000**				**$75,300,000**	
							Contingency		$75,000,000				$26,400,000	35% of Subtotal
							TOTAL CONSTRUCTION COST		**$289,300,000**				**$101,700,000**	
							Engineering, Legal, & Admin		$72,300,000				$25,400,000	25% of Subtotal
							TOTAL PROJECT COST		**$361,600,000**				**$127,100,000**	

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TECHNICAL MEMORANDUM

DATE: June 17, 2022

Project No.: 038-80-21-60
SENT VIA: EMAIL

TO: Michelle Carrey, PE, City of Sacramento
Brett Ewart, PE, City of Sacramento

FROM: Roberto Vera, PE, RCE #83500
Angie Yan, EIT #172428

REVIEWED BY: Elizabeth Drayer, PE, RCE #46872

SUBJECT: Groundwater Well Facilities Valuation for 2022 Development Impact Fee

This technical memorandum (TM) presents West Yost's findings and conclusions for the valuation of the City of Sacramento's (City) existing groundwater facility assets. This valuation will subsequently be used to support the City's ongoing Development Impact Fee (DIF) update. This TM is organized as follows:

- Background
- Valuation Methodology
- Valuation of Existing Groundwater Wells
- Findings and Conclusions

BACKGROUND

The City's Department of Utilities (DOU) has been requested to estimate the current value of the City's existing utility system assets for purposes of updating the City's DIF. For the City's 2022 DIF update, the City requested West Yost to develop an estimated valuation for the City's existing groundwater facility assets. These existing groundwater facility assets include the City's existing active municipal production wells and recently completed municipal production wells which are not yet active. Older inactive wells and non-potable irrigation wells are not included in the valuation.

The valuation considered current replacement costs, current condition/useful life of existing facilities, and recently completed facility improvements that have extended the useful life of the existing facilities. The subsequent sections of this TM describe the methodology used to establish the valuation of the City's groundwater facility assets.

The valuation of other water system facilities, including transmission/distribution system facilities, reservoirs and pump stations, and water treatment plants, are concurrently being developed by others.

VALUATION METHODOLOGY

The value of the City's groundwater facility assets was based on their remaining useful life, along with the typical replacement value (or actual value of the facility, if information was available), and recently completed facility improvements that have extended the useful life of some existing groundwater facilities.

In general, the overall useful life for a groundwater facility is 50 years[1]. A groundwater facility, however, is comprised of several components, each of which have a typical useful life which is different than the overall useful life for the overall facility. For example, site improvements at a groundwater facility are likely to have a much longer useful life than the chemical feed equipment. For the purpose of this valuation, groundwater facilities were subdivided into the following five (5) major components:

- Well Casing (Downhole)
- Pump and Motor
- Electrical Equipment
- Chemical Feed System
- Site/Building

The typical useful life of these major components are summarized in Table 1.

Table 1. Summary of Useful Life Assumptions by Asset Class

Asset Class	Typical Useful Life, years[(a)]	Straight-Line Depreciation Rate, % per year
Well Casing (Downhole)	50	2.0%
Pump and Motor	25	4.0%
Electrical Equipment	25	4.0%
Chemical Feed System	10	10.0%
Site/Building	50	2.0%
Well Facility (Overall)	50	2.0%

(a) Typical useful life estimates are based on recommendations by American Water Works Association and Water Environment Research Foundation.

To develop the value of a groundwater facility asset, the following methodology was used:

- If the groundwater facility's age exceeds the typical useful life of a well, then the value of the well was based on the value of the recent improvements, if any, performed on each of the five major well components (described above). The value of the improvements was first escalated to current dollars and subsequently depreciated based on the remaining useful life (by component). In addition, the value of the land that the groundwater facility is on was also included in the overall value (discussed in more detail in the subsequent sections below).

[1] Based on recommendations by the American Water Works Association and Water Environment Research Foundation.

- If a groundwater facility's age is less than the typical useful life of a well, then the value of the groundwater facility is based on the remaining value of a groundwater facility plus the value of recent improvements, if any, performed on each of the five major well components. If records from the recent construction of the facility were available, this information was used to establish the remaining value of the facility; if these records were not available, then a replacement cost for a new groundwater facility was used to estimate the remaining value of the facility. The value of the improvements was first escalated to current dollars and subsequently depreciated based on the remaining useful life (by component). In addition, the value of the land that the groundwater facility is on was also included in the overall value (discussed in more detail in the subsequent sections below).

Groundwater facility/well construction and rehabilitation records were provided by the City, compiled and reviewed to obtain the value of the recent improvements, and further categorized by major component. As described above, costs were first escalated to current dollars then depreciated, assuming a straight-line depreciation from the improvement year to the current year, based on the assumed depreciation rates shown in Table 1. This depreciated cost for each component was then used in the valuation of the wells described below. Costs were escalated to current (January 2022) dollars using the same methodology that the City typically applies to other projects, where an average of the ENR Construction Cost Index (CCI) for 20-Cities and San Francisco is used as the overall index. This average has been found by the City to be representative of costs in the Sacramento Region.

Groundwater Well Replacement Cost

The conceptual capital cost estimate for a new groundwater well is summarized in Table 2. Estimated construction costs are presented by the same five major well components discussed above and include an estimate of land acquisition costs. These costs are based on recent (2016 - 2022) well bid tabulation information and omit costs that are significantly impacted by market volatility and COVID supply chain constraints. In addition, the construction costs include allowances for general conditions, contractor overhead and profit, sales tax, and planning-level estimating contingencies. The construction costs presented in Table 2 are considered budget-level estimates with accuracies of -10 percent to +40 percent in accordance with the recommendations of the Association of Advancement of Cost Engineering (AACE). Other project costs are also included to estimate the value of other project elements including engineering, construction management and program implementation (e.g., administrative, CEQA, legal, etc.), which are consistent with other City planning efforts including the on-going Water Master Plan. Based on these assumptions, the total capital cost for a new groundwater well is estimated to be $5,060,500.

Land acquisition cost was estimated at $15 per square foot ($15/sq. ft.). This value is based on a review of average list prices and associated gross square footage of empty lots (zoned for commercial and industrial uses) within the North Sacramento and Del Paso Heights neighborhoods[2].

[2] Listings obtained by accessing Zillow.com on April 21, 2022 and are based on average $/sq ft prices.

Costs presented in Table 2 assume that water quality in the new wells/groundwater facilities meet all Title 22 drinking water standards. If water quality in a new well is found to not meet Title 22 drinking water standards, additional treatment facilities would be required for these facilities to be permitted as active wells, and the type of treatment would be dependent on the specific constituents that exceed maximum contaminant levels. Costs associated with these treatment facilities vary widely and would be in addition to the costs presented in Table 2.

Table 2. Conceptual Capital Cost Estimate for a New Groundwater Well

Cost Element	Basis	Estimated Cost
Construction Costs		
Downhole	Based on recent bid costs, not significantly impacted by market volatility and or supply chain constraints	$816,000
Pump and Motor		$150,000
Electrical Equipment		$700,000
Chemical Feed System		$150,000
Site/Building		$700,000
Land Acquisition	$15/sq. ft., with an assumed 6,500 sq. ft. lot	$97,500
	Subtotal	*$2,613,500*
Estimating Contingency	20% of Direct Costs	$523,000
	Subtotal Direct Construction Cost (with Contingency)	*$3,136,500*
General Conditions	10% of Direct Construction Costs (with Contingency)	$314,000
Overhead and Profit	10% of Direct Construction Costs (with Contingency)	$314,000
Sales Tax	8% of 1/2 of Direct Construction Costs (with Contingency)	$126,000
	Total Construction Cost	*$3,890,500*
Other Project Costs[a]		
Engineering	10% of Construction Cost	$390,000
Construction Management	10% of Construction Cost	$390,000
Program Implementation	10% of Construction Cost	$390,000
	Total Other Project Costs	$1,170,000
	Total Capital Costs	**$5,060,500**

(a) Other project cost multipliers are consistent with City's 2022 Water Master Plan assumptions.

VALUATION OF EXISTING GROUNDWATER WELLS

Table 3 summarizes the City's existing groundwater wells, associated pertinent well information (i.e., well name, pumping/firm capacity, active status, reliable status, years of remaining useful life, etc.) and presents the estimate of remaining value, by major asset component (five major well components) and land cost. The total value of the City's existing groundwater wells is estimated at $40.1 million (M).

Almost all the City's wells/groundwater facilities are beyond their useful life with the exception of Wells 153A, 164, 165, 166, and 167. Well 166 was recently completed at the City's E.A. Fairbairn Water Treatment Plant, and is not equipped with any above-grade pumping facilities, and is therefore inactive. Wells 165 and 167 are located at the recently completed Shasta Park reservoir and booster pumping facility and are currently not active and are undergoing startup activities. Wells 165 and 167 have elevated concentrations of methane and manganese, and a treatment system is provided for these wells. As of 2020, the combined production capacity for Wells 165 and 167 was approximately 5,000 gallons per minute (gpm). The treatment system, however, has a maximum capacity of 3,000 gpm, which limits the overall capacity of these wells. Only one well is intended to be operated and treated at a given time.

Well information was obtained during the course of the on-going City Water Master Plan effort. Active and reliable well status is based on City staff input and consistent with other planning activities. While the City has a stated total pumping capacity of 44.0 million gallons per day (mgd), it does not have the capacity to pump all of its groundwater well facilities at one time. Capacity is limited by age and performance of mechanical equipment, water quality of wells, and on-going maintenance activities, and operations at storage tanks and/or surface water treatment plants. The City has, however, identified wells/groundwater facilities that are reliable, meaning that they are more often than not producing water or are slated for upcoming improvements which would make them reliable. This reliable capacity is considered to be the City's firm groundwater supply capacity, and totals 19.6 mgd.

Table 3. Groundwater Well Valuation Summary[a]

Well	Address	[illegible]	[illegible]	[illegible]	[illegible]	Status	[illegible]	[illegible]	APN	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Lot	[illegible]	Notes
Active Wells (Operational)																		
[illegible]	Wardham Dr	1968	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ 144,817	$ [illegible]	$ [illegible]	$ [illegible]	$ 46,772	$ [illegible]	$ 493,000	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	Rio Torro Ave	[illegible]	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ 86,358	$ [illegible]	$ 40,063	$ 36,029	$ 305,520	
[illegible]	[illegible]	[illegible]	1,600	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$	$ [illegible]	$ 4,252	$ [illegible]	$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	5,262	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	1958	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$	$ [illegible]	$ 4,132	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$	$ [illegible]	$	$	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	1950	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ 8,439	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	1955	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	1957	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ 8,399	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	4,902	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$	$ [illegible]	$ [illegible]		$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	#N/A	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$	$ [illegible]	$ [illegible]	$ [illegible]	$	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active			[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ 90,516	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ 2,487,312	
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ -	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ -	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	1,200	N	[illegible]	Active	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ 224,029	$ [illegible]	$ 130,332	$ [illegible]	$ [illegible]	$ [illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	78,000	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	Y	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$	$ [illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	N	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	78,000	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$ [illegible]	$	$ [illegible]	[illegible]
		Total Capacity (mgd)	[illegible]	Firm Capacity (mgd)	[illegible]					Subtotal - Active Wells	$ 18,302,088	$ 1,402,005	$ [illegible]	$ 2,729,418	$ 6,426,820	$ 1,595,672	$ [illegible]	
Inactive Wells																		
Not included in valuation																		
Non-Potable Wells																		
Not included in valuation																		

[illegible footnotes]

FINDINGS AND CONCLUSIONS

The following summarizes West Yost's findings and conclusions from the valuation of the City's groundwater facilities:

- Based on available recent improvement cost information, typical replacement costs or available costs for the construction of recent wells, the total value of the City's groundwater facilities/wells is estimated at $40.1M.
- Nearly all of the City's groundwater facilities/wells are beyond the recommended useful life of 50 years.
- The City will need to make major investments in its groundwater well program to increase the remaining useful life of its groundwater facilities/wells and maintain their firm capacity.
- The City's reliable/firm groundwater supply capacity is currently equal to 19.6 mgd. As the City proceeds with the DIF updates, this supply capacity should be used to define how much existing supply capacity future customers are buying into.

Transmission Mains

City of SACRAMENTO
Department of Utilities

MEMO- DRAFT

TO: Michelle Carrey, Supervising Engineer

FROM: Kathy Sananikone, Assistant Engineer

CC: Brett Ewart, Supervising Engineer

DATE: May 24, 2022

SUBJECT: City Transmission Main Valuation

Summary

The total remaining value of the City of Sacramento's 158 miles of transmission main is estimated to be **$234,483,136** (Table 1). Age of City's transmission mains ranged from 2 to 131 years, with a median age of 47.5 years. Over 56% of the City's mains are older than 47 years; the largest inventory at 60 years. Pipe materials used for transmission mains within the City include cast iron, concrete cylinder, ductile and wrought iron, and riveted and welded steel, with concrete cylinder making up over 50%. Table 2 provides the percent, age range, and pipe diameters for the various pipe materials throughout the City.

Table 1. Remaining Value of Transmission Main

Pipe Diameter (in)	Total Length (%)	2022 Replacement Cost ($)	Depreciation Value ($)	Remaining Value ($)
14	2.1%	$5,879,459	$5,377,265	$502,194
16	2.2%	$7,007,300	$5,510,147	$1,497,153
18	11.9%	$41,502,637	$22,877,685	$18,624,952
20	0.4%	$1,552,273	$1,201,118	$351,155
24	28.2%	$129,218,820	$69,807,439	$59,411,381
30	23.7%	$135,316,484	$86,214,626	$49,101,858
36	18.9%	$129,631,959	$77,960,795	$51,671,164
38	0.3%	$1,992,257	$1,992,257	$0
42	5.2%	$41,713,450	$28,301,920	$13,411,530
48	2.8%	$26,264,881	$15,618,937	$10,645,944
54	3.1%	$32,780,402	$12,207,045	$20,573,357
60	0.6%	$7,427,207	$4,731,372	$2,695,835
66	0.3%	$4,015,372	$754,319	$3,261,054
72	0.3%	$3,894,198	$2,044,967	$1,849,230
84	0.1%	$963,402	$77,072	$886,330
Grand Total	**100.0%**	**$569,160,101**	**$334,676,964**	**$234,483,136**

Table 2. Percentage, Age Range, and Pipe Diameters by Pipe Material

Pipe Material	Percent of Inventory	Age Range	Pipe Diameters (inch)
Cast Iron	2.9%	23-121	14-20
Concrete Cylinder Pipe	51.5%	4-101	14-72
Iron (ductile, wrought)	13.4%	2-107	16-42
Steel (riveted, welded)	31.6%	2-107	10-84
Unknown	0.6%	9-131	14-72

Methodology

Original cost of pipe construction was not available, thus remaining value was based on replacement cost in 2022 dollars minus the depreciation value. Cost estimates per pipe diameter were taken as the average data found in the Sacramento Suburban Water District Water Transmission Main Asset Management Plan published in 2014 and 2020 data provided by consultant, West Yost and Associates. Costs were adjusted to 2022 dollars using ENR's Construction Cost Index (Table 3). Depreciation was calculated for individual pipe sections for varying age and pipe diameters.

Table 3. Estimated Replacement Cost Per Foot

Pipe Diameter (inches)	Estimated Cost in 2022 ($/ft)
14	$ 344.96
16	$ 351.16
18	$ 387.63
20	$ 428.41
24	$ 492.25
30	$ 676.08
36	$ 835.82
48	$ 1,153.09
54	$ 1,291.46
72	$ 1,729.63
78	$ 1,875.69

Assumptions

A straight-line depreciation was used based on a 75-year service life, irrespective of pipe material. For pipes older than 75 years, it was assumed complete depreciation with remaining value of $0. Construction method was assumed to be open trench construction.

Diameter (inches)	Age of Pipe (years)	Length (ft)	Sum of 2022 Replacement Cost	Sum of Depreciation Value ($/yr)	Sum of Remaining Value
14	2	86.67	$28,946	$772	$28,174
	6	51.98	$17,360	$1,389	$15,971
	10	50.17	$16,756	$2,234	$14,522
	13	157.92	$52,746	$9,143	$43,603
	15	96.63	$32,273	$6,455	$25,819
	16	3.00	$1,002	$214	$788
	17	47.47	$15,854	$3,593	$12,260
	34	79.00	$26,386	$11,962	$14,424
	46	282.63	$94,396	$57,896	$36,500
	47	347.11	$115,932	$72,651	$43,281
	56	409.18	$136,663	$102,042	$34,621
	57	2242.25	$748,902	$569,166	$179,737
	60	44.35	$14,814	$11,851	$2,963
	68	672.67	$224,668	$203,699	$20,969
	70	1282.74	$428,431	$399,869	$28,562
	75	836.12	$279,259	$279,259	$0
	76	20.00	$6,680	$6,680	$0
	84	165.19	$55,173	$55,173	$0
	97	3364.49	$1,123,724	$1,123,724	$0
	107	5925.79	$1,979,186	$1,979,186	$0
	121	1438.07	$480,309	$480,309	$0
14 Total		**17603.40**	**$5,879,459**	**$5,377,265**	**$502,194**
16	2	380.44	$143,188	$3,818	$139,369
	4	6.00	$2,258	$120	$2,138
	14	3.54	$1,332	$249	$1,084
	15	58.20	$21,905	$4,381	$17,524
	16	63.77	$24,000	$5,120	$18,880
	20	57.00	$21,452	$5,721	$15,731
	23	3.33	$1,254	$384	$869
	27	2299.21	$865,367	$311,532	$553,835
	29	589.89	$222,021	$85,848	$136,173
	31	1262.01	$474,989	$196,329	$278,660
	33	467.97	$176,131	$77,498	$98,633
	34	122.73	$46,194	$20,941	$25,253
	41	968.05	$364,351	$199,178	$165,172
	54	15.00	$5,645	$4,065	$1,581
	70	1683.80	$633,742	$591,493	$42,249
	85	52.12	$19,618	$19,618	$0
	87	132.55	$49,888	$49,888	$0
	92	9.35	$3,520	$3,520	$0
	107	10017.05	$3,770,173	$3,770,173	$0
	121	425.82	$160,270	$160,270	$0
16 Total		**18617.84**	**$7,007,300**	**$5,510,147**	**$1,497,153**
18	2	211.02	$88,454	$2,359	$86,096
	8	3130.22	$1,312,101	$139,957	$1,172,143
	10	168.16	$70,487	$9,398	$61,089
	12	1625.51	$681,370	$109,019	$572,350
	14	316.47	$132,655	$24,762	$107,893
	15	777.56	$325,931	$65,186	$260,745
	16	913.69	$382,995	$81,706	$301,289
	17	526.84	$220,836	$50,056	$170,780
	18	15.88	$6,655	$1,597	$5,058
	19	5785.66	$2,425,189	$614,381	$1,810,808
	20	3206.82	$1,344,212	$358,457	$985,756
	21	6602.55	$2,767,607	$774,930	$1,992,677

Diameter (inches)	Age of Pipe (years)	Length (ft)	Sum of 2022 Replacement Cost	Sum of Depreciation Value ($/yr)	Sum of Remaining Value
18	23	2316.96	$971,208	$297,837	$673,371
	24	9718.51	$4,073,732	$1,303,594	$2,770,138
	26	10.00	$4,192	$1,453	$2,739
	27	2993.20	$1,254,665	$451,679	$802,986
	34	9179.48	$3,847,785	$1,744,329	$2,103,456
	38	398.53	$167,053	$84,640	$82,413
	43	5172.50	$2,168,169	$1,243,084	$925,085
	45	154.56	$64,788	$38,873	$25,915
	50	2678.16	$1,122,612	$748,408	$374,204
	51	140.25	$58,787	$39,975	$18,812
	54	245.53	$102,918	$74,101	$28,817
	58	3846.45	$1,612,326	$1,246,865	$365,461
	59	13567.76	$5,687,229	$4,473,954	$1,213,276
	60	6320.47	$2,649,366	$2,119,493	$529,873
	61	5709.82	$2,393,398	$1,946,630	$446,768
	62	10005.15	$4,193,883	$3,466,943	$726,940
	67	170.97	$71,666	$64,022	$7,644
	71	16.66	$6,985	$6,612	$373
	84	3085.56	$1,293,383	$1,293,383	$0
18 Total		**99010.90**	**$41,502,637**	**$22,877,685**	**$18,624,952**
20	2	35.00	$16,185	$432	$15,753
	14	3.97	$1,835	$343	$1,493
	20	53.22	$24,610	$6,563	$18,047
	21	14.91	$6,892	$1,930	$4,962
	31	905.02	$418,467	$172,966	$245,500
	55	530.39	$245,247	$179,848	$65,399
	76	1155.59	$534,327	$534,327	$0
	84	556.47	$257,305	$257,305	$0
	95	5.84	$2,701	$2,701	$0
	107	96.68	$44,704	$44,704	$0
20 Total		**3357.09**	**$1,552,273**	**$1,201,118**	**$351,155**
24	2	1307.32	$719,111	$19,176	$699,934
	3	206.89	$113,802	$4,552	$109,250
	4	212.73	$117,013	$6,241	$110,773
	6	107.86	$59,330	$4,746	$54,583
	8	19086.34	$10,498,701	$1,119,861	$9,378,840
	10	3998.13	$2,199,227	$293,230	$1,905,996
	12	7024.74	$3,864,056	$618,249	$3,245,807
	13	216.65	$119,169	$20,656	$98,513
	14	5239.94	$2,882,299	$538,029	$2,344,270
	15	2976.60	$1,637,318	$327,464	$1,309,854
	16	5370.45	$2,954,088	$630,206	$2,323,883
	17	11.32	$6,224	$1,411	$4,813
	18	92.76	$51,023	$12,245	$38,777
	19	6208.26	$3,414,941	$865,118	$2,549,822
	20	10018.46	$5,510,791	$1,469,544	$4,041,247
	21	17.06	$9,386	$2,628	$6,758
	22	8173.73	$4,496,069	$1,318,847	$3,177,222
	23	7386.93	$4,063,283	$1,246,073	$2,817,209
	24	12623.93	$6,943,964	$2,222,069	$4,721,896
	26	564.58	$310,556	$107,659	$202,897
	27	4283.68	$2,356,297	$848,267	$1,508,030
	30	351.83	$193,528	$77,411	$116,117
	33	30.00	$16,502	$7,261	$9,241
	34	90.93	$50,018	$22,675	$27,343

Diameter (inches)	Age of Pipe (years)	Length (ft)	Sum of 2022 Replacement Cost	Sum of Depreciation Value ($/yr)	Sum of Remaining Value
24	35	2060.18	$1,133,228	$528,840	$604,388
	37	10393.22	$5,716,934	$2,820,354	$2,896,580
	38	10334.55	$5,684,660	$2,880,228	$2,804,432
	40	234.61	$129,053	$68,828	$60,225
	41	13799.57	$7,590,642	$4,149,551	$3,441,091
	43	21.56	$11,857	$6,798	$5,059
	48	5212.23	$2,867,055	$1,834,915	$1,032,140
	50	6.00	$3,300	$2,200	$1,100
	51	4470.64	$2,459,139	$1,672,214	$786,924
	52	22.63	$12,446	$8,629	$3,817
	53	9830.18	$5,407,224	$3,821,105	$1,586,119
	54	4642.45	$2,553,643	$1,838,623	$715,020
	55	8838.35	$4,861,654	$3,565,213	$1,296,441
	56	4531.39	$2,492,552	$1,861,105	$631,446
	57	5196.98	$2,858,668	$2,172,588	$686,080
	59	177.73	$97,763	$76,907	$20,856
	60	11359.07	$6,248,211	$4,998,569	$1,249,642
	61	2716.27	$1,494,122	$1,215,219	$278,903
	62	5277.11	$2,902,746	$2,399,604	$503,143
	65	5.00	$2,750	$2,384	$367
	67	60.35	$33,197	$29,656	$3,541
	71	23.32	$12,825	$12,141	$684
	73	20.89	$11,491	$11,185	$306
	76	28987.00	$15,944,693	$15,944,693	$0
	79	411.77	$226,500	$226,500	$0
	84	22.76	$12,517	$12,517	$0
	85	77.82	$42,810	$42,810	$0
	86	7.47	$4,110	$4,110	$0
	87	10347.36	$5,691,705	$5,691,705	$0
	95	64.84	$35,667	$35,667	$0
	96	16.38	$9,012	$9,012	$0
	97	64.90	$35,699	$35,699	$0
	101	80.45	$44,251	$44,251	$0
24 Total		**234916.14**	**$129,218,820**	**$69,807,439**	**$59,411,381**
30	2	141.92	$97,174	$2,591	$94,583
	6	6830.30	$4,676,746	$374,140	$4,302,607
	9	27.95	$19,139	$2,297	$16,842
	13	253.26	$173,410	$30,058	$143,353
	16	4945.33	$3,386,096	$722,367	$2,663,729
	17	90.70	$62,106	$14,077	$48,028
	20	1021.12	$699,164	$186,444	$512,721
	21	10643.88	$7,287,930	$2,040,620	$5,247,309
	22	76.29	$52,238	$15,323	$36,915
	23	2454.22	$1,680,422	$515,330	$1,165,093
	25	439.55	$300,962	$100,321	$200,641
	26	44.21	$30,273	$10,495	$19,778
	29	5052.13	$3,459,227	$1,337,568	$2,121,659
	30	8078.74	$5,531,558	$2,212,623	$3,318,935
	33	1727.46	$1,182,804	$520,434	$662,371
	35	12025.10	$8,233,658	$3,842,374	$4,391,284
	38	6713.12	$4,596,515	$2,328,901	$2,267,614
	42	3023.15	$2,069,967	$1,159,181	$910,785
	48	7675.02	$5,255,130	$3,363,283	$1,891,847
	49	226.11	$154,815	$101,146	$53,669
	50	3568.06	$2,443,074	$1,628,716	$814,358

Diameter (inches)	Age of Pipe (years)	Length (ft)	Sum of 2022 Replacement Cost	Sum of Depreciation Value ($/yr)	Sum of Remaining Value
30	51	9634.37	$6,596,709	$4,485,762	$2,110,947
	52	19643.61	$13,450,100	$9,325,402	$4,124,697
	53	2389.99	$1,636,437	$1,156,416	$480,022
	54	8714.01	$5,966,537	$4,295,907	$1,670,630
	55	3874.42	$2,652,841	$1,945,416	$707,424
	56	732.89	$501,814	$374,687	$127,126
	57	398.53	$272,876	$207,386	$65,490
	59	8389.53	$5,744,364	$4,518,900	$1,225,464
	60	36912.74	$25,274,372	$20,219,497	$5,054,874
	61	1912.53	$1,309,517	$1,065,074	$244,443
	62	19959.82	$13,666,608	$11,297,729	$2,368,879
	67	516.73	$353,808	$316,068	$37,739
	76	5.48	$3,752	$3,752	$0
	84	8055.68	$5,515,771	$5,515,771	$0
	101	1429.18	$978,569	$978,569	$0
30 Total		**197627.13**	**$135,316,484**	**$86,214,626**	**$49,101,858**
36	6	187.11	$154,010	$12,321	$141,689
	8	4.54	$3,737	$399	$3,338
	12	12315.85	$10,137,171	$1,621,947	$8,515,223
	15	4377.77	$3,603,341	$720,668	$2,882,673
	16	3249.90	$2,674,995	$570,666	$2,104,329
	18	1285.40	$1,058,016	$253,924	$804,092
	21	2486.07	$2,046,280	$572,958	$1,473,322
	22	6152.69	$5,064,274	$1,485,520	$3,578,753
	24	542.85	$446,819	$142,982	$303,837
	25	8387.23	$6,903,528	$2,301,176	$4,602,352
	26	11761.37	$9,680,777	$3,356,003	$6,324,775
	27	30.21	$24,862	$8,950	$15,912
	31	1150.49	$946,968	$391,413	$555,554
	33	7285.19	$5,996,434	$2,638,431	$3,358,003
	34	1319.91	$1,086,417	$492,509	$593,908
	35	4.09	$3,364	$1,570	$1,794
	38	533.53	$439,145	$222,500	$216,645
	41	1694.08	$1,394,400	$762,272	$632,128
	42	12.00	$9,877	$5,531	$4,346
	45	77.20	$63,541	$38,124	$25,416
	50	4.96	$4,086	$2,724	$1,362
	51	10098.79	$8,312,313	$5,652,373	$2,659,940
	53	8022.42	$6,603,254	$4,666,300	$1,936,955
	54	545.60	$449,083	$323,340	$125,743
	55	1442.87	$1,187,626	$870,926	$316,700
	57	5162.03	$4,248,867	$3,229,139	$1,019,728
	58	13381.69	$11,014,467	$8,517,854	$2,496,612
	59	9017.52	$7,422,320	$5,838,892	$1,583,428
	60	9796.95	$8,063,869	$6,451,095	$1,612,774
	61	19352.72	$15,929,214	$12,955,760	$2,973,453
	62	1680.65	$1,383,340	$1,143,561	$239,779
	68	2943.14	$2,422,497	$2,196,397	$226,100
	71	7756.49	$6,384,366	$6,043,867	$340,500
	76	2756.13	$2,268,569	$2,268,569	$0
	84	130.00	$107,004	$107,004	$0
	95	2542.98	$2,093,130	$2,093,130	$0
36 Total		**157492.43**	**$129,631,959**	**$77,960,795**	**$51,671,164**
38	95	2289.78	$1,992,257	$1,992,257	$0
38 Total		**2289.78**	**$1,992,257**	**$1,992,257**	**$0**

Diameter (inches)	Age of Pipe (years)	Length (ft)	Sum of 2022 Replacement Cost	Sum of Depreciation Value ($/yr)	Sum of Remaining Value
42	9	3901.96	$3,766,344	$451,961	$3,314,383
	18	1554.31	$1,500,294	$360,070	$1,140,223
	33	295.82	$285,538	$125,637	$159,902
	42	3096.37	$2,988,752	$1,673,701	$1,315,051
	43	1132.77	$1,093,396	$626,880	$466,515
	44	310.78	$299,977	$175,987	$123,991
	45	299.82	$289,404	$173,642	$115,761
	55	4007.50	$3,868,220	$2,836,695	$1,031,525
	56	9125.45	$8,808,291	$6,576,857	$2,231,434
	57	5885.16	$5,680,619	$4,317,270	$1,363,349
	59	3859.52	$3,725,381	$2,930,633	$794,748
	61	7518.35	$7,257,043	$5,902,395	$1,354,648
	76	1029.57	$993,791	$993,791	$0
	95	1198.04	$1,156,400	$1,156,400	$0
42 Total		43215.43	$41,713,450	$28,301,920	$13,411,530
48	19	6.63	$7,367	$1,866	$5,501
	22	8503.94	$9,449,067	$2,771,726	$6,677,341
	23	19.94	$22,159	$6,795	$15,363
	24	350.62	$389,583	$124,667	$264,917
	54	2559.17	$2,843,597	$2,047,390	$796,207
	57	3716.61	$4,129,676	$3,138,554	$991,122
	59	4605.16	$5,116,977	$4,025,355	$1,091,622
	61	3875.71	$4,306,455	$3,502,583	$803,872
48 Total		23637.77	$26,264,881	$15,618,937	$10,645,944
54	6	625.03	$788,033	$63,043	$724,990
	17	2819.49	$3,554,779	$805,750	$2,749,029
	18	358.71	$452,254	$108,541	$343,713
	19	7326.75	$9,237,474	$2,340,160	$6,897,314
	27	6265.23	$7,899,119	$2,843,683	$5,055,436
	28	620.48	$782,293	$292,056	$490,237
	30	4321.20	$5,448,120	$2,179,248	$3,268,872
	52	588.18	$741,565	$514,152	$227,413
	57	215.01	$271,080	$206,020	$65,059
	59	2326.89	$2,933,712	$2,307,853	$625,858
	61	532.98	$671,974	$546,539	$125,435
54 Total		25999.94	$32,780,402	$12,207,045	$20,573,357
60	6	147.70	$208,881	$16,710	$192,171
	17	157.87	$223,252	$50,604	$172,648
	18	1035.85	$1,464,890	$351,574	$1,113,316
	23	87.31	$123,472	$37,865	$85,608
	34	126.24	$178,530	$80,934	$97,596
	59	2847.73	$4,027,217	$3,168,077	$859,140
	61	664.27	$939,408	$764,052	$175,356
	109	21.63	$30,583	$30,583	$0
	115	17.41	$24,624	$24,624	$0
	116	59.54	$84,199	$84,199	$0
	128	23.89	$33,791	$33,791	$0
	131	62.48	$88,359	$88,359	$0
60 Total		5251.93	$7,427,207	$4,731,372	$2,695,835
66	6	1293.38	$2,032,340	$162,587	$1,869,753
	18	340.78	$535,486	$128,517	$406,969
	24	921.22	$1,447,546	$463,215	$984,331
66 Total		2555.39	$4,015,372	$754,319	$3,261,054
72	6	2.00	$3,464	$277	$3,187
	17	211.91	$367,071	$83,203	$283,868

Appendix A

Diameter (inches)	Age of Pipe (years)	Length (ft)	Sum of 2022 Replacement Cost	Sum of Depreciation Value ($/yr)	Sum of Remaining Value
72	18	910.66	$1,577,485	$378,596	$1,198,889
	61	1123.51	$1,946,178	$1,582,891	$363,287
72 Total		**2248.08**	**$3,894,198**	**$2,044,967**	**$1,849,230**
84	6	466.47	$963,402	$77,072	$886,330
84 Total		**466.47**	**$963,402**	**$77,072**	**$886,330**
Grand Total		**834289.73**	**$569,160,101**	**$334,676,964**	**$234,483,136**

Parent Program	Total Budget	Existing Customers Share $	Existing Customers %	New Growth Share $	New Growth %
BACKFLOW PREVENTION DEVICE3330 Total	$150,000	$150,000	100.00%	$0	0.00%
BASE CIP CONTINGENCY-WATER Total	$18,000,000	$18,000,000	100.00%	$0	0.00%
DISTRIB MAIN REHAB PROGRAM Total	$179,337,970	$179,337,970	100.00%	$0	0.00%
DOU FACILITIES IMPR/REHAB Total	$2,850,000	$2,188,817	76.80%	$661,183	23.20%
DOU IT PROGRAM Total	$8,390,000	$6,443,571	76.80%	$1,946,429	23.20%
DRINKING WATER QUALITY 3330 Total	$1,375,000	$1,056,008	76.80%	$318,992	23.20%
FIRE HYDRANT & GATE VALVE REPL Total	$5,250,000	$5,250,000	100.00%	$0	0.00%
FLORIN RES BACK UP ENGINE Total	$1,750,000	$1,344,011	76.80%	$405,989	23.20%
FWTP REHAB Total	$40,730,000	$31,280,887	76.80%	$9,449,113	23.20%
INFORMATION TECHNOLOGY - SCADA Total	$26,191,990	$20,115,607	76.80%	$6,076,383	23.20%
RESERVOIR REHAB PROGRAM Total	$54,520,000	$41,871,691	76.80%	$12,648,309	23.20%
RESIDENTIAL WATER METERING PRO Total	$45,050,000	$45,050,000	100.00%	$0	0.00%
SECURITY & EMERG PREP PROG Total	$4,950,000	$3,801,630	76.80%	$1,148,370	23.20%
SHASTA PARK 4MG RES AND PMP ST Total	$250,000	$192,002	76.80%	$57,998	23.20%
SRWTP IMPROVEMENTS PROGRAM Total	$53,075,460	$40,762,275	76.80%	$12,313,185	23.20%
SRWTP INTAKE SED RMVL Total	$200,000	$153,601	76.80%	$46,399	23.20%
SRWTP PROPERTY ACQUISITION3350 Total	$911,580	$700,099	76.80%	$211,481	23.20%
TRANS MAIN REHAB PROGRAM Total	$26,499,999	$20,352,160	76.80%	$6,147,839	23.20%
UNPLANNED CORRECTIVE MAINT. Total	$9,000,000	$6,912,055	76.80%	$2,087,945	23.20%
WATER+ PROGRAM [1]	$1,329,830,580	$966,706,427	72.69%	$363,124,153	27.31%
WELL REHAB PROGRAM Total	$113,060,000	$86,830,766	76.80%	$26,229,234	23.20%
ANNUAL MISCELLANEOUS	$1,113,262	$854,985	76.80%	$258,277	23.20%
Totals	**$1,922,485,841**	**$1,479,354,562**	**76.95%**	**$443,131,279**	**23.05%**
Adjustment for New Resiliency Unrelated to New Growth					
Totals from Above	$1,922,485,841	$1,479,354,562	76.95%	$443,131,279	23.05%
Resiliency Cost Unrelated to New Growth		$45,056,356	100.00%	($45,056,356)	-100.00%
Adjusted Totals	**$1,922,485,841**	**$1,524,410,918**	**79.29%**	**$398,074,923**	**20.71%**

Sources: DOU Alternative 3.1, EPS

Appendix_B.2a

Note:

[1] The Water+ Program includes the $220,000,000 RiverArc project to increase capacity by 30 mgd. New growth will need 22 mgd of this capacity for new growth exclusively. The value of this capacity is $161,333,333 and is allocated to New Growth. The remaining 9 mgd will benefit all customers, so is shared equally between Existing Customers (76.80%) and New Growth (23.20%). These shares are $45,056,356 and $13,610,311 respectively.

Descriptions

CIP	Objective	Description
Backflow Prevention Device3330	To ensure compliance with the City's Cross-Connection Control Program, the Department of Utilities annually tests backflow devices to ensure that backflow prevention assemblies are working properly.	Annually test backflow devices for city departments requiring backflow testing and repairs and issue a permit, or "tag" to show compliance of the State requirement.
BASE CIP CONTINGENCY-WATER	Reserve for unforeseen capital program needs.	Facilitate the completion of capital projects by reserving appropriations for minor overruns and provide a source of funds for small projects that could not be anticipated before the start of the fiscal year.
Distrib Main Rehab Program	Improve water distribution system reliability including increased pressures and fire suppression capabilities.	Replace water distribution mains (pipes twelve-inch in diameter or smaller) and other work associated with the distribution system that have maintenance issues or have exceeded their useful life.
DOU Facilities Impr/Rehab	Improve the existing condition of Department of Utilities facilities through maintenance and/or replacement projects for continued occupancy of Department of Utilities sites.	This program provides funding for capital improvements to Department of Utilities facilities including space planning and rehabilitation projects.
DOU IT Program	Supports initiatives through technology advancements by providing reliable systems that improves customer service and staff with tools to be more efficient and make decisions that promotes the Department's vision.	Planning and implementation of IT initiatives as well as coordination and management of IT resources and oversight on all identified IT programs, software, hardware upgrades, and consulting services.
Drinking Water Quality 3330	Comply with drinking water regulatory requirements of the California Surface Water Treatment Rule, and California Code of Regulations Title 22.	Provide for drinking water regulatory efforts that encompass water production through the water treatment plants, wells, and reservoirs; and distribute this water to ratepayers.
Fire Hydrant & Gate Valve Repl	Replace valves and fire hydrants to facilitate positive system shutdowns and improve the system's reliability and safety.	Replace valves and fire hydrants in the water distribution system that have failed or are obsolete.
Florin Res Back Up Engine	Complete necessary improvements for reliability of pump station and redundancy needs for maintenance, including needed safety upgrades. (Parent CIP to close in FY24.)	Design and construct various improvements at Florin Pump Station including air quality, improved communications, flow meter replacement, pump redundancy, programming improvements, and improved safety and reliability of station.
FWTP Rehab	Make available to the City a reliable 100-120 million gallons per day of water treatment capacity at the E.A. Fairbairn Water Treatment Plant.	Rehabilitate the E.A. Fairbairn Water Treatment Plant (FWTP) structures constructed in 1964.
Information Technology - SCADA	Provide improvements and maintenance of the SCADA system that have been deemed essential and critical and are used by Operations to remotely control and monitor the facilities and equipment for the Water, Wastewater, and Storm Drainage infrastructure per the SCADA master plan.	This program funds the maintenance and improvements of the Supervisory Control and Data Acquisition (SCADA) system as defined in the SCADA master plan.

Reservoir Rehab Program	Improve the water system reliability and extend useful lives of the City's reservoirs.	Rehabilitation work at water reservoirs, including booster pump stations, which may include patching interior and exterior coatings, improvements to cathodic protection systems, pump and motor improvements, electrical upgrades, structural repairs, etc.
Residential Water Metering Program	Comply with AB 2572, promote conservation, and bill customers for the amount of water they use. Once the City is fully metered, a replacement program will be developed to replace meters, gateways, endpoints and other associated infrastructure.	Install water meters at residential homes that do not currently have meters. Assembly Bill (AB) 2572 requires water meters be installed on existing water service connections by 2025. Once the City is fully metered, a replacement program will be developed and implemented.
Security & Emerg Prep Prog	Implement the Department of Utilities' Security Master Plan recommendations, as accepted by City Council in September 2014.	Provide security improvements to key Water, Drainage, and Wastewater facilities as recommended in the DOU Security Master Plan.
Shasta Park 4Mg Res And Pmp St	Provide water to the southern portion of the City during peak hour demands, fire demands, and emergencies. (Parent CIP to close in FY24.)	Design and construct a four million gallon (4MG) water storage reservoir, booster pump station, and two groundwater wells.
SRWTP Improvements Program	Make available to the City a reliable 160 million gallons per day of water treatment capacity at the Sacramento River Water Treatment Plant (SRWTP).	Maintenance projects, upgrades due to regulatory changes, safety improvements, or updating antiquated electrical equipment are examples of projects to be designed and implemented.
SRWTP Intake Sed Rmvl	Parent CIP to close in FY24	
SRWTP Property Acquisition	Parent CIP to close in FY24	
Trans Main Rehab Program	Ensure the reliability of the water distribution system and reduce potential damage from transmission main breaks.	Replace existing water transmission mains (pipes larger than twelve-inch diameter) that have significant maintenance issues with new reliable mains that meet City standards.
Unplanned Corrective Maint.	Enable repairs needed to continue operating efficiently.	Correct and repair unexpected critical failures with the City's water infrastructure.
Water+ Program	Ensure the City has sufficient and resilient water treatment capacity for the future water demands of the City of Sacramento.	Design plans and specifications for the development of necessary water supply expansion improvements needed due to expected growth as well as resiliency projects for the City's water supply and facilities.
Well Rehab Program	Improve City's water supply reliability and groundwater extraction capability. A reliable groundwater supply will optimize conjunctive management of the City's water supply and will allow the City to participate in future drought banking programs and water transfers.	Rehabilitate and replace dilapidated infrastructure at the City potable groundwater facilities. Monitoring capabilities may be required and other work associated with the groundwater well program.
Annual Miscellaneous	See Description	This represents estimated remaining available appropriations for the current year for the Transmission and Distribution Main Rehabilitaion Programs. Estimated requirements for future years are in those programs and are described above.

Sources: DOU and EPS

Appendix_B.2b

Appendix B-3

Companion Charts to Tables 2-10 and 2-11

Table 2-10: Charts by Land Use and Meter Size

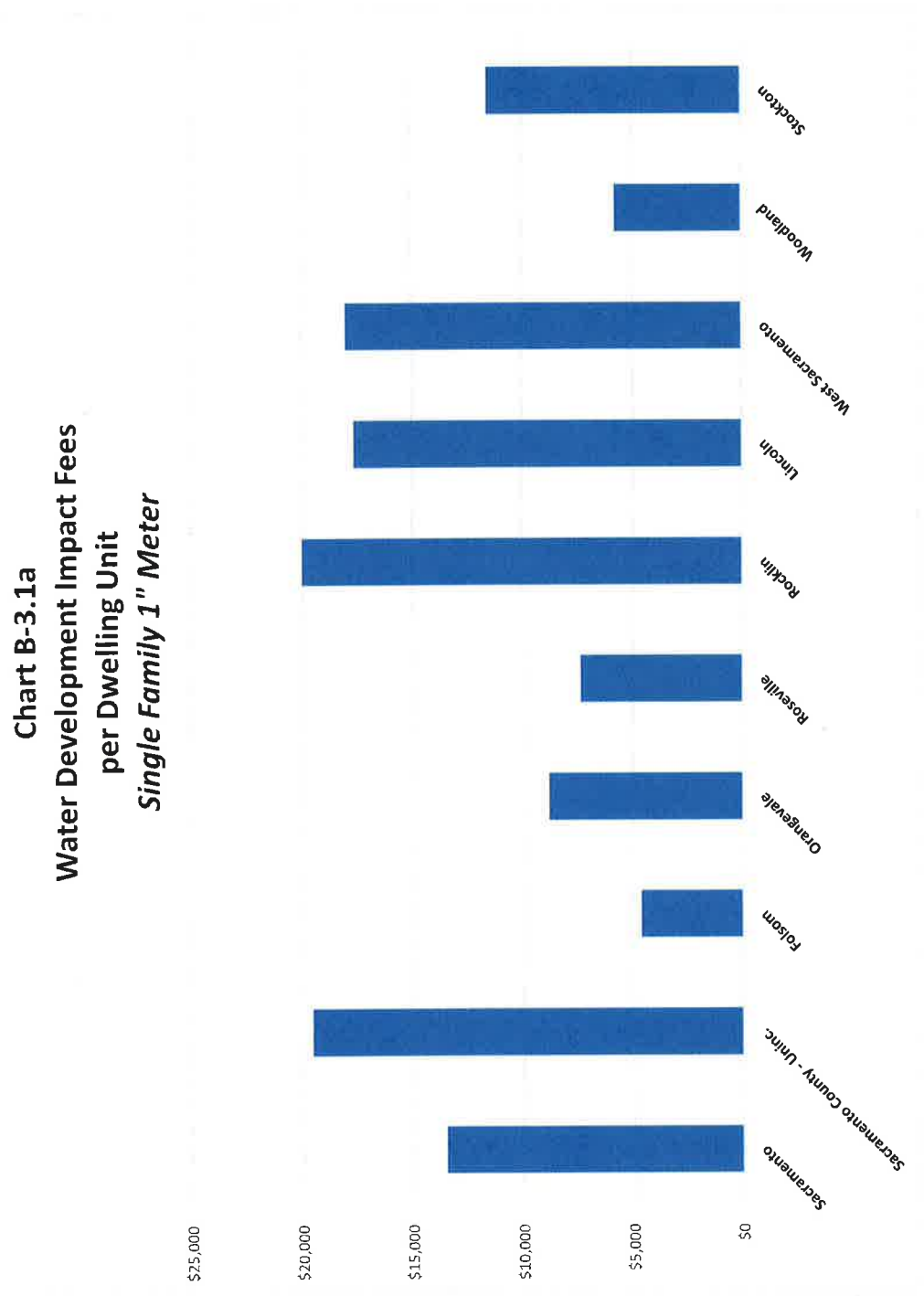


Chart B-3.2a
Water Development Impact Fees
Retail - 2, 2" Meters

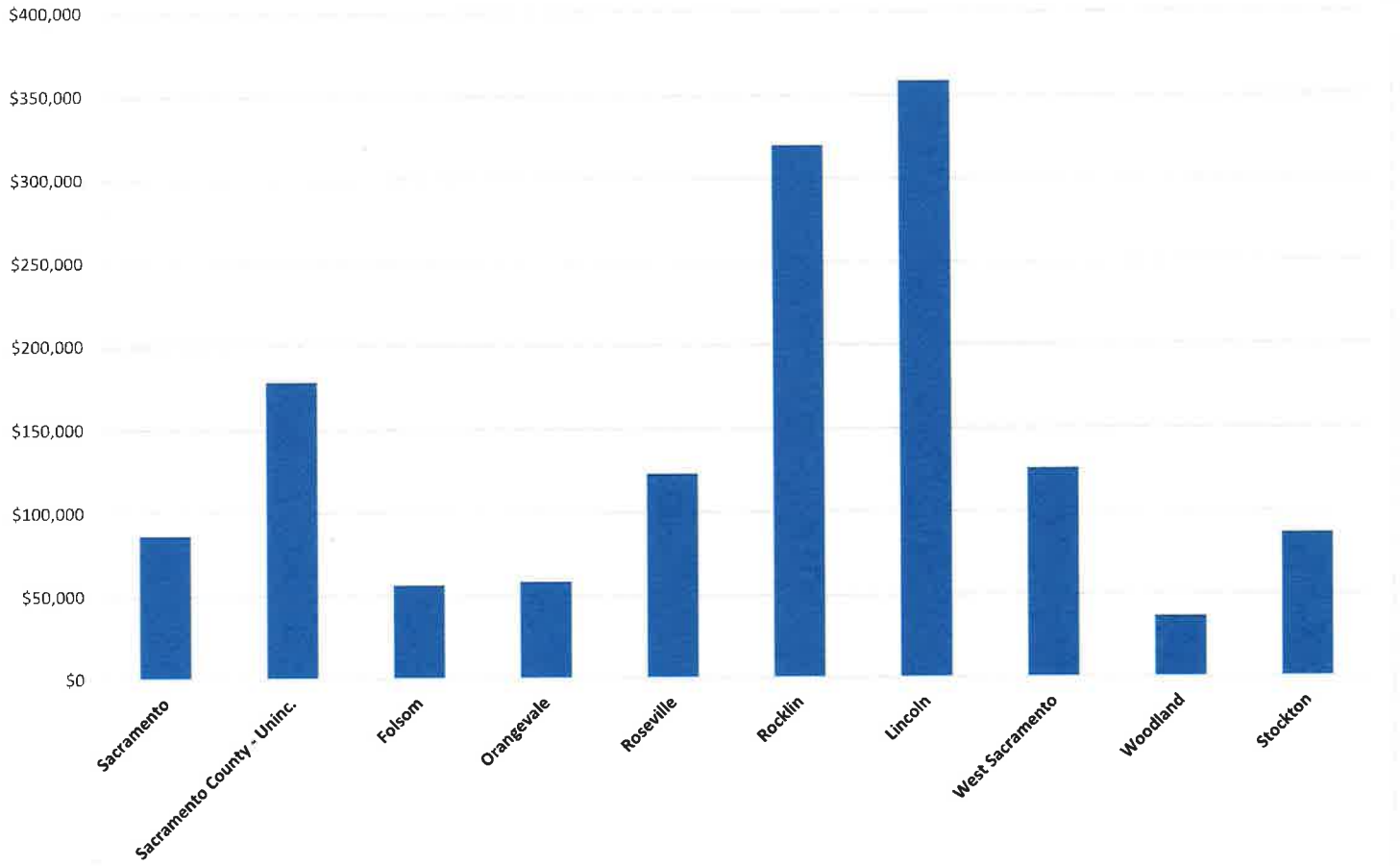


Chart B-3.3a
Water Development Impact Fees
Office - 2, 2" Meters

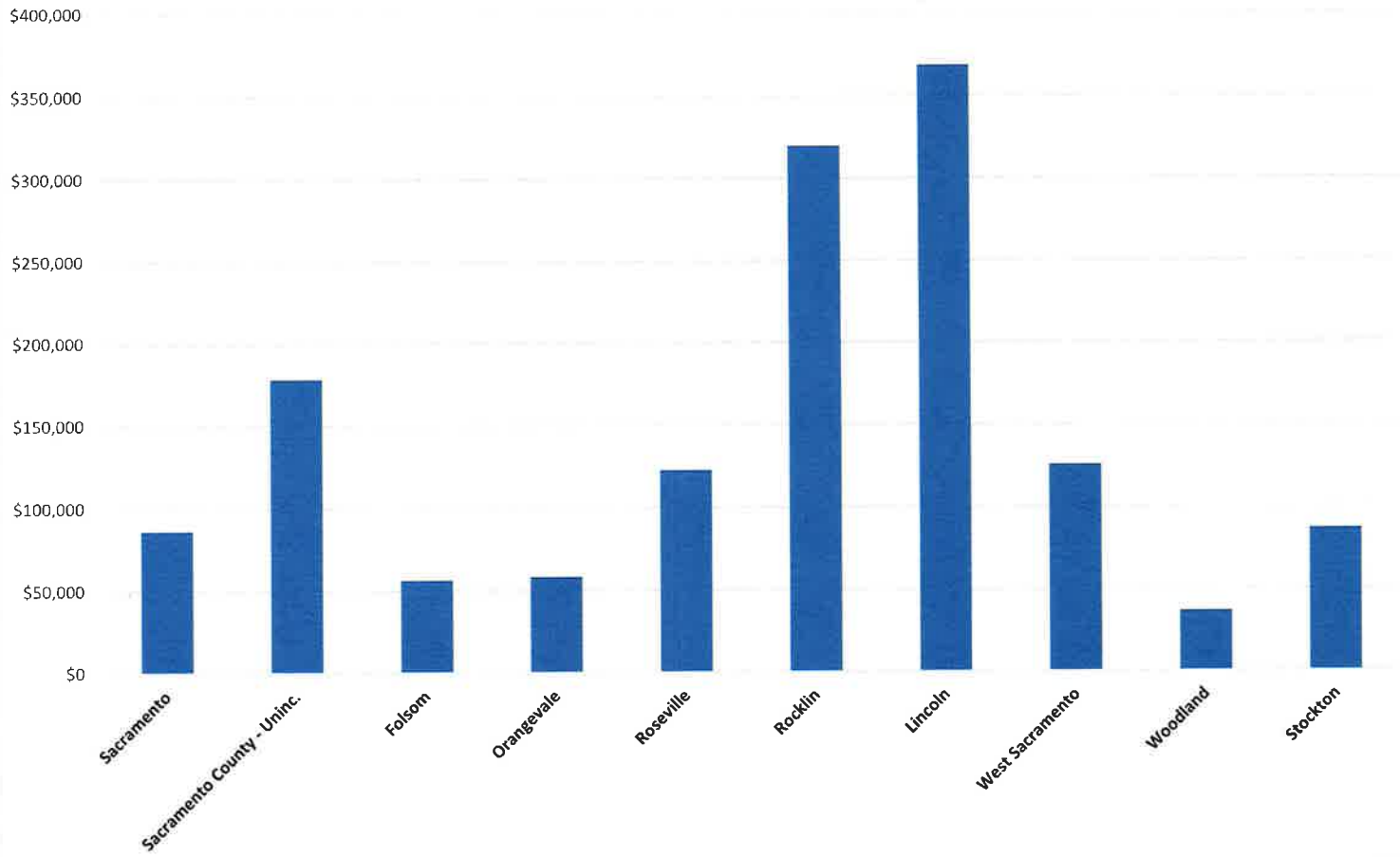


Chart B-3.1
Water Development Impact Fees
per Dwelling Unit
Single Family

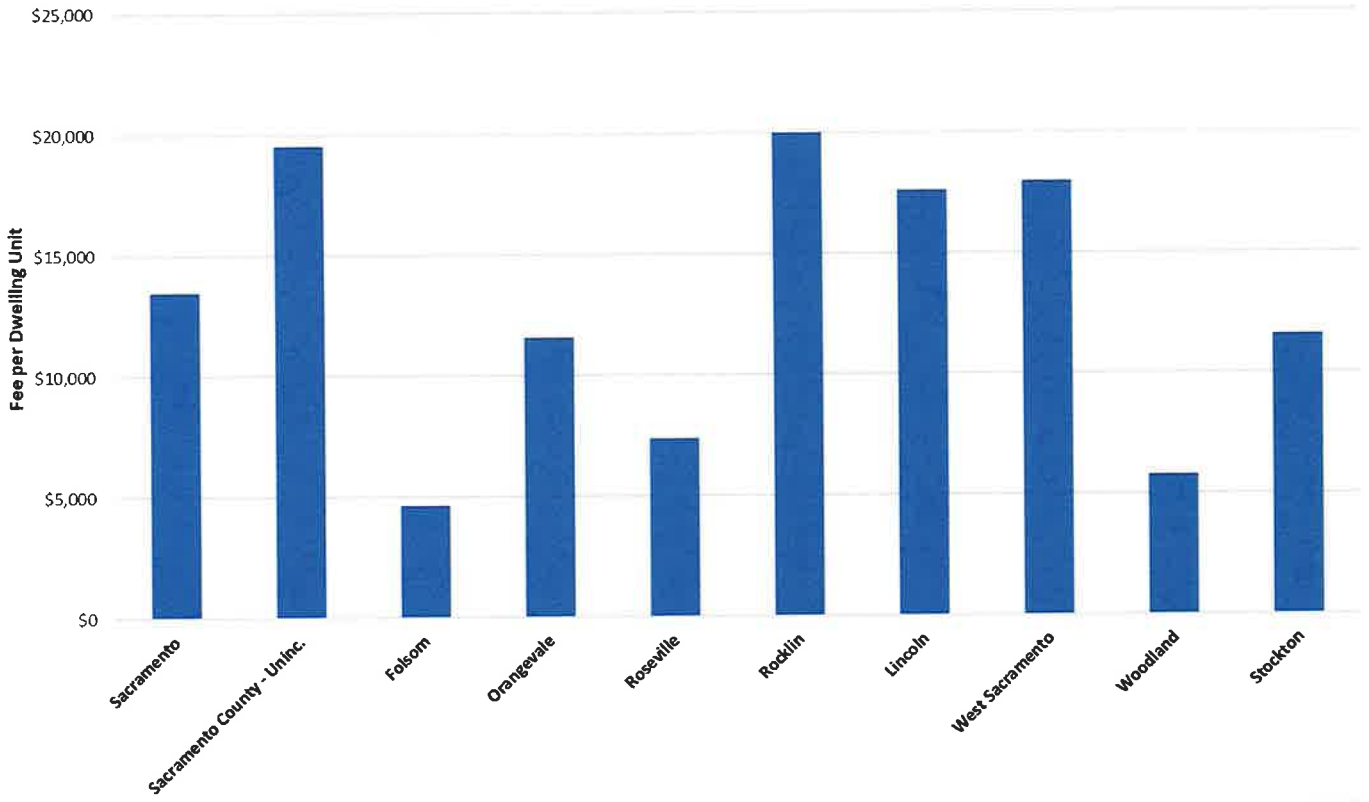


Chart B-3.2
Water Development Impact Fees
per 1,000 Building Square Feet
Retail

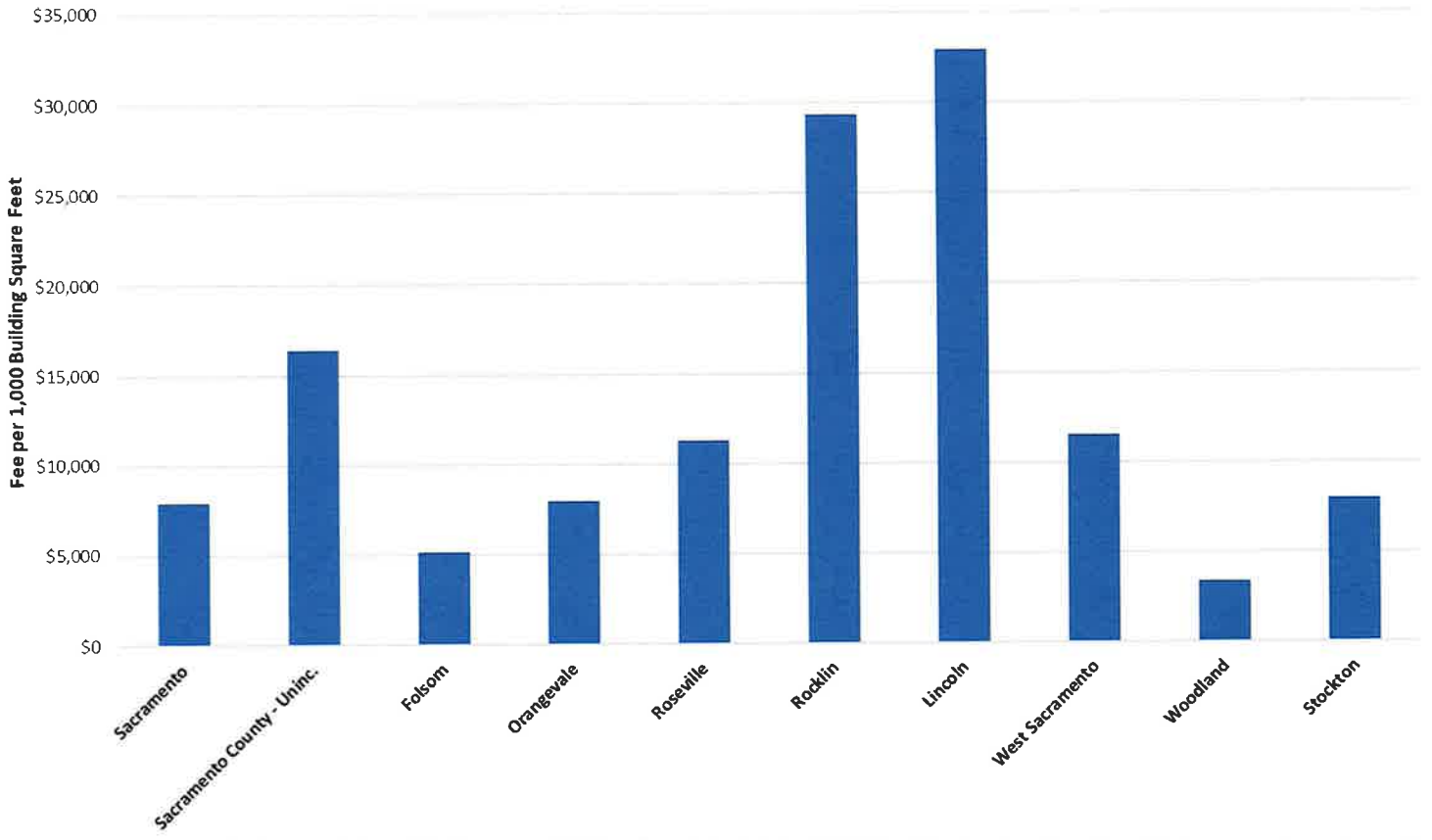


Chart B-3.3
Water Development Impact Fees
per 1,000 Building Square Feet
Office

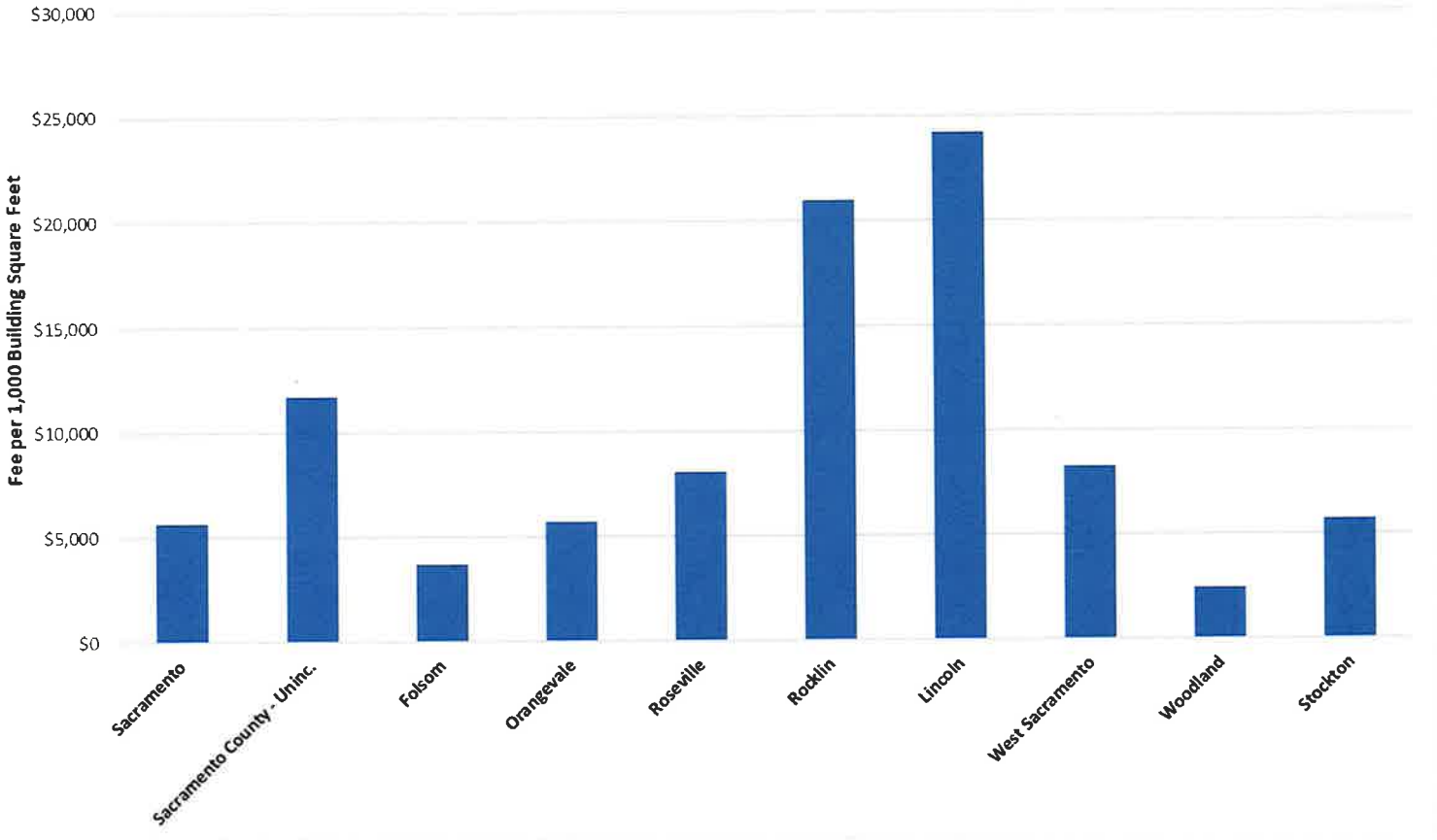


Chart B-3.4
Water Development Impact Fees per Acre
Single Family

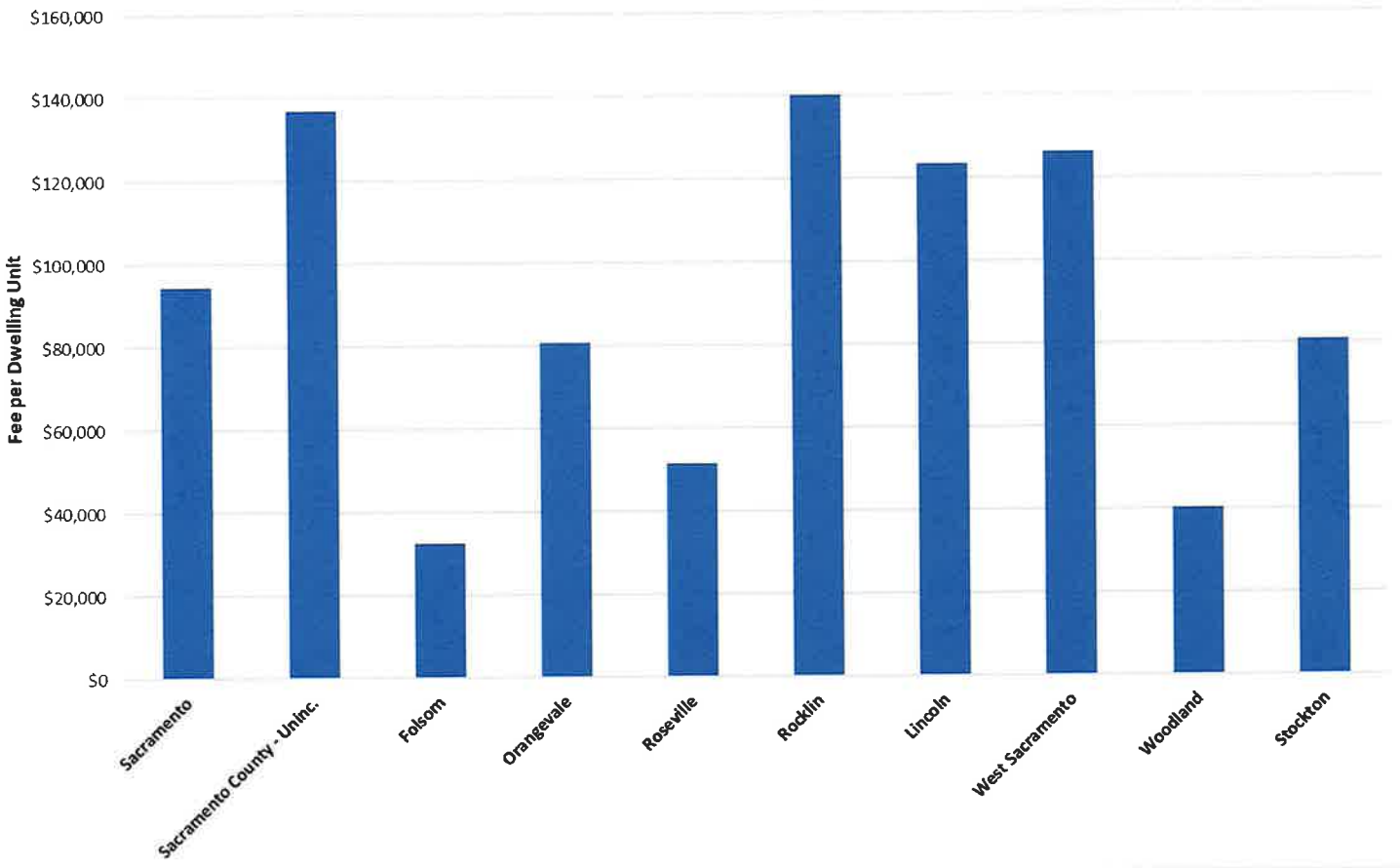


Chart B-3.5
Water Development Impact Fees per Acre
Retail

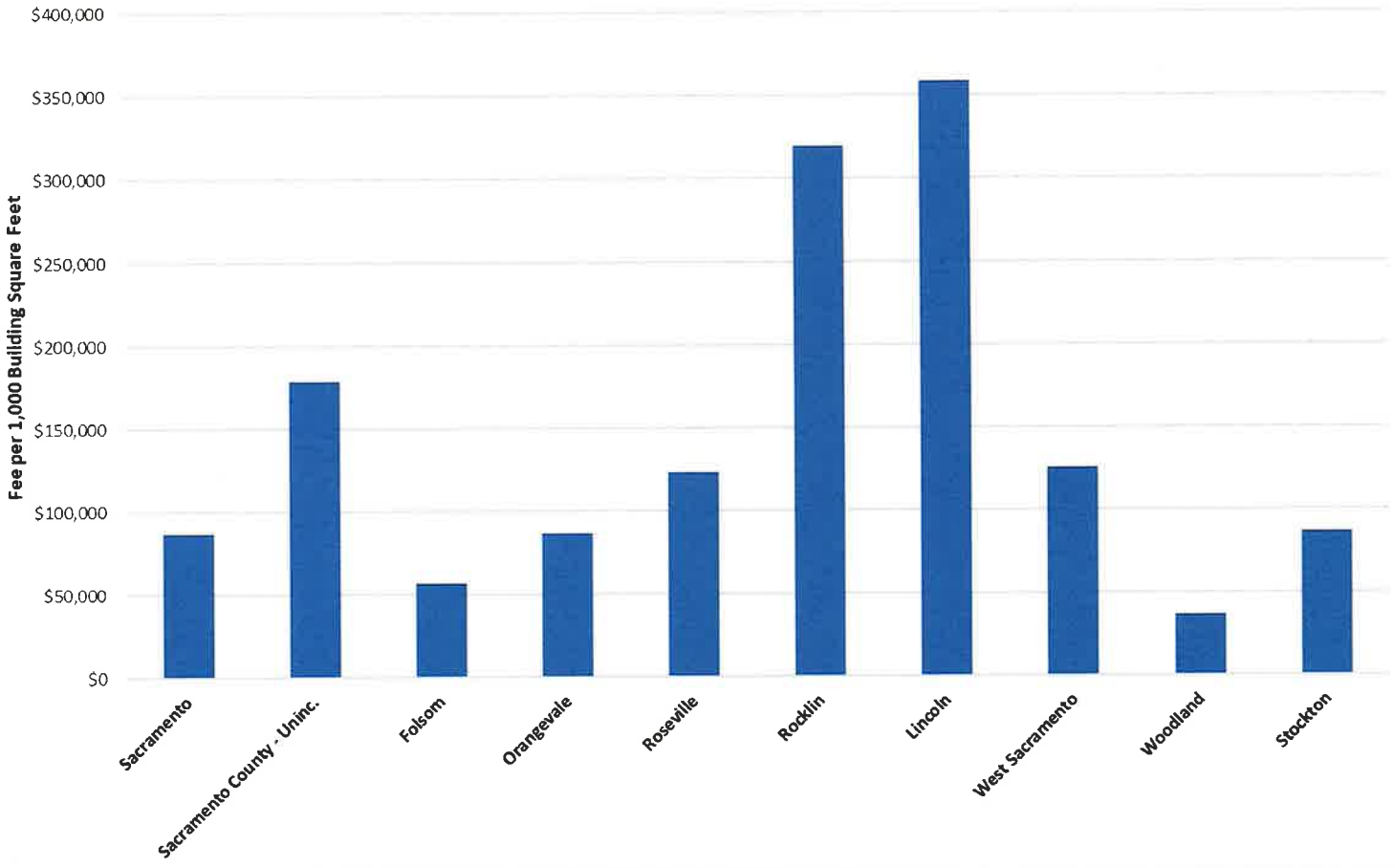
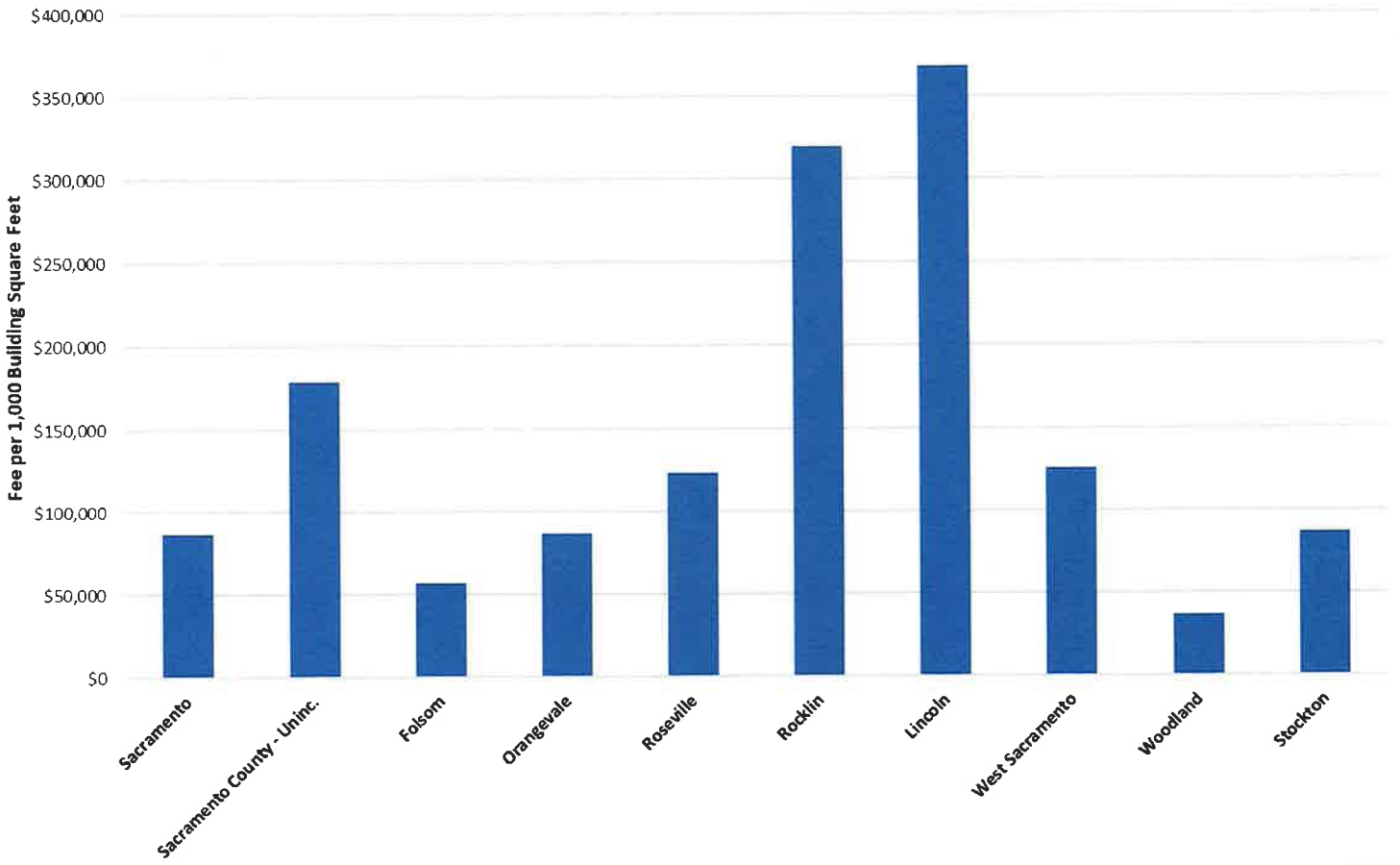


Chart B-3.6
Water Development Impact Fees per Acre
Office



APPENDIX C:

Separated Sewer System Utility

Appendix C-1: Technical Memorandum, Department of Utilities, November 18, 2009

Appendix C-2: Sample of Basin Improvements

Appendix C-3: Separated Sewer Detailed Fee Schedule

Appendix C-4: Companion Charts to Table 3-8

Appendix C-1

Technical Memorandum, Department of Utilities, November 18, 2009

DEPARTMENT
OF UTILITIES

ENGINEERING
SERVICES DIVISION

CITY OF SACRAMENTO
CALIFORNIA

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November 18, 2009

TECHNICAL MEMORANDUM:

PRELIMINARY HYDRAULIC ANALYSIS SEPARATED SEWER BASINS

This technical memorandum (TM) summarizes our approach to evaluate the hydraulic capacity of sanitary sewer "backbone" facilities in each of the City of Sacramento (City) separated sewer basins. This evaluation is part of a broader effort to develop a reasonably accurate and realistic Sewer Development Fee by, in part, estimating the hydraulic capacity of the facilities utilizing a consistent method. Portions of the City have been evaluated via master plans over the past 15 years, but the methods were not consistent. Excluded from this study were combined sewer system facilities located in the older central City area and all small collection pipelines not identified as belonging to the "backbone" network of pipes.

The following sections present background information regarding the separated sewer system within the City, along with a discussion of the general wastewater components and methodology used in the hydraulic capacity evaluations. In addition, the approach used for estimating the 2009 capital costs to replace and improve, if warranted, the existing "backbone" sewer infrastructure within the basins is discussed. Reports are included in the appendices that provide information regarding the existing infrastructure, existing land uses, and projected future land uses within each basin, along with the specific wastewater components used in each hydraulic evaluation. Finally, the results of the hydraulic and capital costs evaluations for each basin are summarized.

This study involved static hydraulic evaluations based on various simplifying assumptions in order to satisfy limitations imposed on the project. Therefore, this study did not include flow monitoring, condition assessment of sewer facilities, or dynamic modeling of the collection systems and, thus, provides only a general overview of hydraulic considerations within the basins. The reports presented in the appendices can be used as a preliminary assessment of hydraulic capacity and as a screening tool to determine if a more detailed sanitary sewer study is required.

Background Information

Wastewater collection in the City of Sacramento is provided by both the City and the County of Sacramento. The Sacramento Area Sewer District (SASD) maintains approximately 35 percent of the public collection system within the City limits, primarily in the northwest and southeast sections of the City. The City Department of Utilities (DOU) maintains the remaining portion of the public collection system, which includes a combined sewer system in the older central City area with a total service area of approximately 7,545 acres and approximately 305 miles of 4 to 120 inch diameter pipes. The separated sewer system, which is described below in more detail, is located primarily in the northeast, east and southwest sections of the City with a total service area of about 20,750 acres.

Wastewater conveyed by the City's separated sewer system is routed by the collection system to the Sacramento Regional Wastewater Treatment Plant (SRWTP) for treatment and disposal via an interceptor system consisting of large diameter pipes and pump stations. The interceptor system and the SRWTP, located just south of the City limits, are owned and operated by the independent Sacramento Regional County Sanitation District (SRCSD). A detail showing the City of Sacramento and SASD service areas, as well as the location of SRCSD interceptor pipe within the City service area is presented in Figure 1.

Maintenance of the City's separated sewer system is provided by three Divisions within the DOU. The Field Services Division maintains the entire collection system infrastructure, including approximately 485 miles of 4 to 42 inch diameter gravity collection pipes, about 5.3 miles of force mains, and about 14,400 manholes. The Plant Services Division maintains the pump stations. The Engineering Services Division coordinates with the Field and Plant Services Divisions to design and manage all capital improvement projects related to sewer replacement and rehabilitation. Figure 1 and Tables 1 and 2 show the size and distribution of separated gravity and force main pipes in the City service area.

Table 1 - Gravity Collection Pipe

Pipe Diameter (inch)	Length (feet)	Length (miles)	Percentage of System (by length)
4	7,164	1.36	0.28
6	1,594,110	301.91	62.3
8	460,984	87.31	18.0
10	151,597	28.71	5.9
12	122,078	23.12	4.8
15	66,088	12.52	2.6
18	35,671	6.76	1.4
21	59,534	11.28	2.3
24	31,906	6.04	1.2
27	3,376	0.64	0.13
30	11,314	2.14	0.44
36	978	0.19	0.04
42	14,706	2.79	0.57
Total	2,559,507	484.8	100

Table 2 - Force Mains

Pipe Diameter (inch)	Length (feet)	Length (miles)	Percentage of System (by length)
4	4,679	0.89	16.66
6	1,752	0.33	6.2
8	5,859	1.11	20.9
12	4,976	0.94	17.7
18	4,379	0.83	15.6
21	5,138	0.97	18.3
24	497	0.09	1.8
30	42	0.01	0.15
36	772	0.15	2.75
Total	28,094	5.3	100

The separated sewer system is composed predominately of vitrified clay and reinforced concrete pipes. A majority of the pipes were installed between the 1940's and the 1970's. Pipes in the older sections of the City were constructed in the late 1800's and early 1900's. Since the 1970's, polyvinyl chloride (PVC) pipe gradually gained acceptance and now PVC pipe is used almost exclusively as replacement pipes and in new construction.

The City service area is divided into 49 separated sewer basins. Thirty-nine of the sewer basins are pumped through individual pump stations. The remaining ten sewer basins gravity flow directly or indirectly into the SRCSD interceptor pipes. Twenty-seven of the pump stations were constructed between the 1950's and the 1970's; most of these pumps have been rehabilitated and/or upsized during the past ten years. The remaining 13 pump stations were constructed between 1985 and 2004 with only one pump station (Sump 122) rehabilitated in 1999. Many of the pump stations discharge into downstream gravity sewers which, in turn, convey the wastewater to pump stations further downstream. Because of this interconnection, changes in one basin can affect the performance of the separated sewer system in downstream basins. Figure 2 shows the layout of separated sewer basins in the City.

Wastewater Components

Sewer or wastewater flows used to evaluate hydraulic capacity are composed of several components termed: (1) average dry weather flow (ADWF), (2) peak dry weather flow (PDWF), (3) peak wet weather flow (PWWF), (4) groundwater infiltration (GWI), and (5) rainfall-dependent infiltration/inflow (RDI/I). The latter two components are collectively referred to as infiltration/inflow (I/I). The following presents a brief discussion of each component and factors used in the hydraulic evaluations.

Average Dry Weather Flow

The ADWF is the average daily sanitary sewer flow contribution from residential, commercial, industrial and institutional users at any given point in the collection system during dry season conditions, excluding all flow from groundwater infiltration and

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Average Dry Weather Flow

The ADWF is the average daily sanitary sewer flow contribution from residential, commercial, industrial and institutional users at any given point in the collection system during dry season conditions, excluding all flow from groundwater infiltration and

stormwater runoff infiltration/inflow.

Sewer system planning within the City is typically based on a unit flow rate representing the average sanitary sewer flow contribution from one single family residence, termed an Equivalent Single-Family Dwelling unit, or ESD. The flow contributions from other types of land uses are expressed in terms of either an equivalent number of ESDs, actual water usage, an appropriate density factor (e.g., dwelling units or ESDs per net acre), or some other parameter that reflects sewage generation. For example, the flow from one multi-family dwelling unit is equated to 0.75 ESD, whereas a density factor of 6 ESD/acre may be used to equate flows from commercial/retail users. The ADWF is determined by totaling the ESDs from land uses that contribute flow to a particular collection pipe and then multiplying the value by a unit flow rate expressed in units of gallons per day per ESD (gpd/ESD).

The current City Design and Procedures Manual requires that a unit flow rate of 400 gpd/ESD be used for planning purposes. A reduced unit flow rate of 310 gpd/ESD was selected for this evaluation based on flow monitoring performed by the DOU and the SASD in recent years[1]. This reduced unit flow rate will be included in future revisions to the City Design and Procedures Manual.

To support the impact fee evaluation and for use in future planning, the ADWF was evaluated for three land use scenarios: existing conditions; development and/or redevelopment conditions expected by the year 2030, coinciding with the City's 2030 General Plan; and ultimate build-out conditions. A discussion regarding how land use conditions were determined for each basin is presented in the subsection titled "Land Use Conditions" and in the Basin Reports included in the Appendices.

Once the existing land use data was compiled, land uses that could reasonably be expected to convert sewer flow to the collection system were converted to equivalent ESDs using the factors shown on Table 3. The existing ADWF was determined by multiplying the total ESDs within the basin or subbasin by the unit flow rate of 310 gpd/ESD.

Table 3

Land Use	ESD Flow Unit
Single-Family Residential	1
Multi-Family Residential	0.75
Commercial/Industrial	6 per net parcel acre.
Schools	0.13 per capita
Open Spaces/Parks, etc.	0

Once the acreage for all new or future 2030 and Build-out land use was compiled, the equivalent new or additional ESDs were calculated using the density factors presented in Table 4. The additional 2030 ESDs where then added to the Existing ESDs to establish the total 2030 ESDs for each basin or subbasin. Likewise, the additional Build-out ESDs were then added to the 2030 ESDs to establish the total Build-Out ESDs for each basin

1 Flow monitoring performed by the DOU and SASD has shown a significant reduction to the unit flow rate due to water conservation policies and measures. Measured unit flow rates typically range from less than 200 gpd/ESD to 300 gpd/ESD. A unit flow rate of 310 gpd/ESD is currently used by SASD for planning studies. The SASD unit flow rate appears reasonable with an adequate safety factor.

or subbasin. The total ESDs were then multiplied by the unit flow rate to determine the 2030 and Build-out ADWF.

Table 4

Land Use	*ESDs/Ac.*[2]
Suburban and Traditional Neighborhoods	
Low Density	6
Med. Density	11
High Density	20
Urban Neighborhoods	
Low Density	15
Med. Density	45
Commercial/Retail Centers and Corridors	
Suburban & Traditional Center	6
Regional Commercial Center	6
Urban Center Low	11
Urban Center High	25
Suburban Corridor	6
Urban Corridor	11
Other	
Employment Center Low Rise	6
Employment Center Mid-Rise	9
Industrial	11
Public/Quasi-Public	6
Open Space/Parks, etc.	0

Peak Dry Weather Flow (PDWF)

The diurnal flow pattern in Sacramento and most cities tends to vary throughout the day in a typical way, generally peaking early in the morning in the upstream sewers and later and less sharply in the larger downstream sewers with higher flows. The PDWF refers to the maximum dry weather flow rate that is likely to be seen at any given point in the collection system. The typical PDWF tends to be 1½ to 2½ times the ADWF.

In a static hydraulic analysis, the most common means of expressing the anticipated magnitude of the PDWF is by a "peaking factor" (PF), which relates the PDWF to the ADWF. The current City Design and Procedures manual provides a diagram relating the ADWF to the PF. As alluded to earlier, recent flow monitoring clearly shows that water conservation policies and measures have not only reduced the unit flow rate from 400 gpd/ESD to 310 gpd/ESD, but also reduced the measured PDWFs. These findings appear to be consistent with studies performed by other agencies and cities, such as SASD, Los Angeles and Portland among others. Using flow measurements recorded by the City and SASD, the DOU has developed a representative PF, which is more consistent with the PF used by cities such as Los Angeles and Portland. The new PF equation used in the evaluations is as follows:

$$PF = 1.9(ADWF)^{0.1} \quad (\text{min. } PF = 1.5, \text{ max. } PF = 3.0)$$

2 Numerous jurisdictional resources were reviewed to determine the density factors listed on Table No. 2. Density factors were averaged and then compared to available flow monitoring and water usage data within the City to obtain a reasonable and representative value for the various land uses.

PDWF = ADWF x PF

This PF will be included in future revisions to the City Design and Procedures Manual.

Groundwater Infiltration (GWI)

GWI is groundwater that enters the sewer system through cracks or defective joints in pipes and manhole walls. The magnitude of GWI depends on the condition of the sewers as well as on the depth of the groundwater table with respect to the local sewer collection system. Therefore, GWI is highly dependent on location and topography. Sewers in low lying areas near the Sacramento and American Rivers and the many creeks traversing the Sacramento area tend to exhibit higher GWI rates.

GWI is typically expressed on a unit area basis (gpd/acres or gpad) by dividing GWI flow determined through flow monitoring by the sewered acreage of the monitored area. An evaluation of City and SASD flow monitoring data suggests that typical GWI rates range from about 100 to 500 gpad. SASD currently applies a GWI value of 200 gpad for design of all collection systems in their service area based on data collected at the Sacramento Regional Wastewater Treatment Plant. Unlike the Sacramento service area, however, much of the area served by the SASD is located away from rives and creeks and generally at a higher elevation. Thus, groundwater levels for a majority of their service area tend to be relatively deep in comparison to the collection system. Because of Sacramento's proximity to rivers and creeks, groundwater tends to be relatively shallow under much of the City. This factor, combined with the recent flow monitoring data and the old age of the City collection system, a GWI value of 300 gpad was considered more representative of conditions in the City provided groundwater is 15 feet or less in depth. If the groundwater table was found to be below a depth of 15 feet, no GWI was included in estimated sewer flows. The 15 foot depth was selected because most sewer facilities in the City are located near and/or above this depth.

For the purpose of our evaluation, groundwater elevations for the basin were determined using the data from geotechnical studies maintained on the DOU intranet and/or groundwater contour maps published by the California Department of Water Resources between Spring 1979 and Spring 2007[3]. Ground surface elevations were determined based on Lidar elevation maps also available on the DOU intranet.

The DOU recognizes that groundwater elevations can and will fluctuate due to variations in precipitation, temperature, localized pumping, and other factors. Therefore, it is possible that groundwater elevations may be higher or lower than the levels reported in past geotechnical studies and generalized groundwater contour maps.

Rainfall-Dependent Infiltration/Inflow (RDI/I)

RDI/I is infiltration and inflow that is directly related to rainfall events. RDI/I may enter the sewer collection system through manhole and pipe defects, as well as direct surface drainage connections such as illegally connected roof, pool and yard drains. The magnitude of RDI/I flows are related to the intensity and duration of the rainfall, the

3 Spring groundwater contour maps were selected because river and creek stages and, thus, groundwater elevations tend to be at or near their highest levels.

relative soil moisture at the time of the rainfall event, the condition of the collection system, and other factors. Peak sewer flows during rainfall events are typically the highest flow rates that occur in any sewer collection system.

Planning studies completed by outside consultants for Basins 21, 55, 85, 119, 127, 134, 135, 136, 137 and 145 have shown RDI/I flow rates ranging from less than 1,000 gpd/acre (gpad) to over 9,000 gpad for a 6-hr, 10-year frequency storm event (storm event used for design per the City Design and Procedures manual). SASD has reported RDI/I ranging from 1,000 to 6,000 gpad within their system for the same design storm event and subsequently elected in their planning studies to incorporate RDI/I rates of 1,600 gpad for older existing development and 1,400 gpad for newer (less than 5 years old) and future development. Based on flow data collected from the planning studies completed in the City, the RDI/I rate of 1,600 gpad appears appropriate for sewers less than 20 years old (coinciding with the predominate use of PVC pipe in Sacramento). For sewers greater than 20 years old, an RDI/I rate of 2,500 gpad appears generally representative. Therefore, unless specific flow monitoring and RDI/I data was available for a basin, these values were used in the flow evaluations.

The DOU recognizes that, aside from pipe age, many other factors can contribute to RDI/I. In the absence of flow monitoring data for each basin, however, these other factors cannot be accurately determined. Flow data presented in previous planning studies did suggest a general correlation between pipe age and RDI/I and, thus, it was felt that pipe age would be the best method of quantification for the stated purpose of the evaluations.

Peak Wet Weather Flow (PWWF)

The PWWF refers to the maximum flow rate observed or predicted at any given point in the collection system during extreme wet weather conditions and is the component typically used to evaluate sewer facilities. Because the peak RDI/I during a storm event can occur at any time of the day, it is conservatively assumed in this analysis that the peak RDI/I flow would coincide with the PDWF. Therefore, the PWWF is the sum of the PDWF, GWI, and RDI/I components plus any flows from extraneous discharges. Extraneous discharges are flows from pump stations that discharge into the basin or SASD pipes that discharge into the City's system. Flows from permitted "special dischargers," such as from industries that discharge high flows into the sewer for a limited time period, were not considered in this evaluation. These special dischargers, however, should be considered in any future project specific sewer studies or master plans.

$$PWWF = PDWF + GWI + RDI/I + Extraneous\ Flow$$

Hydraulic Capacity Evaluation

Land Use Conditions

The first step in the evaluation process was to compile the existing and future land use data for each basin. To support the impact fee evaluation and for use in future planning, three land use scenarios were evaluated: existing conditions; development

and/or redevelopment conditions expected by the year 2030, coinciding with the City's 2030 General Plan; and ultimate build-out conditions. It is recognized that full build-out of every parcel in a basin is never likely to occur. This scenario, however, provides for a sufficient level of conservatism to allow the DOU to plan sewer facilities with useful lives of about 50 to 100 years, which is typical industry standard, without significant risk of shortfalls in future capacity.

For the purpose of the evaluations, the existing land use conditions in a basin were separated into the five general categories listed in Table 3 and compiled using the 2008 Master Address Database GIS files, the 2008 GIS Parcel files, the 2005 Existing Land Use GIS files, and school web sites available on the internet. Since detached single family residences and attached multi-family residences contribute a vast majority of flow to the City's sewer collection system, the Master Address Database was felt to be the best source for obtaining a reasonably accurate residential count within the basins. The Parcel and Existing Land Use files were used to identify commercial/retail, industrial and open space parcels and to determine the gross acreage of the parcels. State and local school district web sites were used to determine enrollment at the numerous public and some private schools in the basins.

2030 land uses were determined using a GIS map developed by the Long Range Planning Department (LRPD) that identifies vacant and potentially subdividable parcels within the City that they feel have a potential or likelihood of being developed or redeveloped by the year 2030. Subdividable parcels are large, currently occupied parcels that have a reasonable potential of being subdivided to a higher density land use. This map was then overlain by a GIS land use map also developed by the LRPD for the City's 2030 General Plan titled "Land Use & Urban Form Diagram" to determine the anticipated future land use and acreage for each of the identified vacant and subdividable parcels.

Build-Out land uses were determined in the same manner as the 2030 land uses except that the Master Address Database was overlain on a 2008 aerial photograph to visually identify the remaining vacant and potentially subdividable parcels within the basin. The aerial photograph was then overlain by the "Land Use & Urban Form Diagram" to determine the anticipated future land use and acreage for each of the parcels. An assumption was made that land uses for existing low to high density housing and existing retail/commercial/industrial developments would not change in the future.

Backbone Pipes

Once the existing and future land use information was compiled, the land uses were then plotted in GIS format on individual aerial photographs of the basins that included overlays showing parcel locations and the layout of the collection systems. Based on the distribution, type, and density of the land uses, by inspection "backbone" pipes were selected for evaluation and nodes were chosen at the downstream end of "backbone" pipes. Backbone pipes are pipes that serve relatively large tributary or shed areas and/or pipes that will serve future developments or redevelopments that could contribute significant flow. Nodes correspond to sewer manholes. The basins were then graphically separated, generally along parcel lines, into smaller subbasins that could be used to evaluate tributary sewer flow to the nodes.

Once the nodes and subbasins were selected within a basin, the acreage and land use data was separated according to the subbasins for estimating the ESDs in each subbasin and the ADWF, PDWF and PWWF at each node using an Excel spreadsheet and the assumptions and methods previously discussed. Using the same Excel spreadsheet, the selected backbone pipes upstream of a node were then analyzed using Manning's Equation to estimate if the pipes are able to convey the PWWF without surcharging[4]. If the hydraulic capacity of a pipe was found to be inadequate, the evaluation was concluded by estimating the minimum pipe diameter required to convey the flow.

Limited information is currently available regarding the line and grade (slope) of the existing collection system. In addition, the flow characteristics throughout most of the system have not been measured through flow monitoring. Accordingly, several assumptions had to be made in order to complete the evaluations. These included a pipe roughness or Manning's coefficient of 0.013 and a minimum flow velocity of 2 feet per second (fps) when the pipe is flowing full, both minimum criteria per the current City Design and Procedures Manual. In order to achieve the flow velocity of 2 fps, the minimum pipe slopes presented on Table 5 were assumed in the evaluations.

Table 5

Pipe Diameter (inch)	Min. Slope (ft/ft)
6	0.005
8	0.0035
10	0.0025
12	0.002
15	0.0015
18	0.0012
21	0.00092
24	0.00077
27	0.00066
30	0.00057
33	0.00051
36	0.00045
42	0.00037
48	0.00031
54	0.00026
60	0.00023
66	0.0002
72	0.00018
78	0.00016
84	0.00015
90	0.00013

Pump Station

The hydraulic capacity of pump stations were evaluated by comparing the current firm discharge capacity of the pump stations to the projected PWWF discharging into the pump stations. The "firm" discharge capacity is the capacity of a pump station with all pumps operating at the same time, except for one of the larger pumps. If the firm discharge capacity of a pump station exceeded the projected PWWF, the pump station was judged to have adequate hydraulic capacity with no required modifications. If the

4 A flow condition, i.e., pressure flow, resulting when the downstream hydraulic capacity is less than the upstream inflow causing sewer to accumulate and rise above the inside crown of a pipe or facility

firm discharge capacity of a pump station was less than the projected PWWF, it was assumed that the station would need either additional pumps installed or, if no room is available in the wet well, that some or all of the pumps would need to be removed and replaced with larger capacity pumps and associated electrical equipment. The potential need for complete reconstruction of a pump station for increased discharge capacity is beyond the scope of this study.

Quality Control

In an effort to "test out" or "ground proof" the methodology and conclusions of the preliminary hydraulic evaluations, the results for Basins 21, 55, 85 and 119 were compared to the findings reported in planning studies completed by outside consultants for these basins. In all cases, the studies identified the same pipes as having insufficient capacity. In a few instances, the conclusions varied as to the pipe diameter required to convey the estimated PWWF, but in no case did the pipe diameter vary by more than one pipe size, plus or minus. Since the results of the studies compared well, it was concluded that the methodology used in these preliminary evaluations produced reasonable results for the stated purpose of the evaluations.

Capital Costs Evaluation

A capital costs evaluation was performed to determined the average cost/ESD to: (1) replace the existing collection system and pump stations; (2) improve/upsize existing sewer backbone infrastructure that does not have adequate hydraulic capacity to convey the estimated existing and/or future PWWF without surcharging; and (3) both improve/upsize existing hydraulically inadequate sewer backbone infrastructure and replace the remaining sewer infrastructure, including pump stations. The evaluation was performed using the average unit costs obtained from the DOU Bid Book and the following assumptions:

1. All sewer pipes estimated to have inadequate flow capacity would be replaced with a new larger diameter pipe along the same line and grade as the existing pipe using conventional trench and fill construction.
2. In order to align the life cycle of the new pipe with the existing manholes along its alignment; all manholes greater than 20 years old would be replaced with a new manhole and all manholes 20 years or less in age would be rehabilitated in-place.
3. Unmarked utility crossing would be encountered at an interval of one per every 200 linear feet of new pipe alignment.
4. Due to wet soil, debris, etc., 0.3 tons of unsuitable soil (about 25% of the native backfill for a 10 foot deep trench excavation) will need to be excavated and replaced per foot of new pipe alignment.
5. If a existing pump station was found to have inadequate discharge capacity for the estimated existing or future PWWF, capital costs include the addition of pumps or the replacement of some or all the existing pumps to increase the capacity of the pump station. Costs assume that the existing building and wet well are structurally adequate and include costs to modify inlet and outlet control structures and switch gear.
6. A combined construction and estimating contingency of 25 percent would be

adequate to address potential unknowns, such as utility conflicts, and other miscellaneous construction issues, such as the need for dewatering, soil contamination, shoring and bracing, etc.

7. Existing sewer services, between the main and the point of service at the property line, would need to be realigned and/or replaced at an interval of one per every 100 linear feet of new pipe alignment.

Summary

The evaluation results indicate that about 121,848, 147,485 and 171,191 linear feet of sanitary sewer "backbone" pipe will need to be improved/upsized in 17 of the 49 sewer basins to adequately serve the estimated Existing, 2030, and Build-out land uses, respectively. The remaining 32 basins possess backbone pipelines that are adequately sized to convey flow generated by all the projected land uses. The improvements would also include the replacement or rehabilitation of about 450 to 600 manholes along the backbone pipe alignments and modifications to increase the capacity of between 5 and 7 pump stations. Overall, this would constitute improving between 5 and 7 percent of entire (backbone and non-backbone) separated sewer system. Approximately 73, 60 and 52 percent of the backbone improvements needed to serve the estimated Existing, 2030 and Build-out land use conditions, respectively, would be concentrated in four basins, Basins 55, 85, 119 and G354. In addition, the City would need to construct about 13,080 linear feet of new backbone sewer pipe in the northern portion of Basin G302, which is currently not served by the City system. A summary of the estimated linear footage of existing backbone pipe and manholes estimated to need improvement in each of the 17 sewer basins is presented on Table 6.

Table 6

Basin	Backbone Pipe Needing Capacity Improvement, linear ft.						Manholes	
	Existing Land Use	% of Improve.	2030 Land Use	% of Improve.	Build-Out Land Use	% of Improve.	Min.	Max.
32	2,310	1.9	2,310	1.6	2,755	1.6	13	14
45	1,697	1.4	2,062	1.4	3,945	2.3	8	20
48	5,052	4.1	8,072	5.5	9,292	5.4	20	35
55	33,565	27.5	33,565	22.8	33,565	19.6	117	117
80	0	0	3,365	2.3	3,365	2.0	12	17
85	17,565	14.4	17,565	11.9	17,565	10.3	49	49
87	7,505	6.2	7,505	5.1	7,505	4.4	24	24
106	1,505	1.2	4,765	3.2	6,100	3.6	7	24
119	16,970	13.9	16,970	11.5	16,970	9.9	62	62
121	1,925	1.6	1,925	1.3	1,925	1.1	7	7
137	1,850	1.5	1,850	1.3	1,850	1.1	4	4
G301	2,240	1.8	4,720	3.2	16,880	9.9	9	44
G302	0	0	2,609	1.8	5,272	3.1	5	11
G303	2,915	2.4	4,560	3.1	6,830	4.0	13	24
G304	3,385	2.8	4,745	3.2	4,745	2.8	13	16
G305	2,815	2.3	10,065	6.8	11,795	6.9	8	34
G354	20,549	16.9	20,832	14.1	20,832	12.2	88	88

Basins North of American River	37,930	31.1	59,899	40.6	80,057	46.8	140	243
Basins South of American River	83,918	68.9	87,586	59.4	91,134	53.2	319	347
Total	121,848		147,485		171,191		459	590

A summary of the capital costs to replace and/or improve the backbone pipe network in each separated sewer basin to meet the needs of the projected land uses is presented on Figure 3. The estimated cost to replace the existing separated sewer system (both backbone and non-backbone) is about $1.051 billion, or about $14,114 per existing ESD. The cost to upsize or improve the backbone network is estimated to be about $93.9 and $109.2 million, or about $7,412 and $4,422 per projected new/future ESD for the 2030 and Build-Out land use conditions, respectively. Lastly, the cost to upsize or improve backbone facilities to meet the needs of the Existing, 2030 and Build-Out land use conditions and to replace all the remaining backbone and non-backbone facilities size-on-size is estimated to be about $1.066, $1.069 and $1.071 billion, or about $14,326, $12,269 and $10,800 per estimated total ESD, respectively.

Approximately 62.5 percent of the total separated sewer pipe network is comprised of 4 to 6 inch diameter pipe that is by and large over 50 years old. Over the years, maintenance of these pipes have absorbed a majority of the Operations and Maintenance (O&M) budget since most are near or have exceeded their service life and are particularly susceptible to stoppages or plugging from root intrusion and the build-up of fats, oils and grease. The frequency of stoppages in larger diameter pipe has been found to be significantly less. To further complicate issues, about 150 miles of this pipe is located in residential backyard easements, making it additionally difficult and costly to maintain and replace the pipe. Often repairs need to be made using hand excavations or small, inefficient equipment. In addition, landscaping, hardscape, fences, etc. frequently need to be removed and replaced in order to complete the repair. As a result, City Standards over the past 20+ years have required all new sewer pipes to be at least 8 inches in diameter and located in streets or other City right-of-ways in an effort to reduce future maintenance costs.

By the year 2030, and certainly at Build-out, most of the existing 4 to 6 inch pipe will have reached and exceeded its service life and need to be replaced. At the same time, all pipes and manholes in residential backyard easements will need to be abandoned and relocated to the nearest street or accessible City right-of-way. Backyard services will also need to be replaced and redirected to the new pipe. Although replacement of these pipes is inevitable, the capital cost analysis presented herein did not consider this additional cost. If this cost had been included, it would have increased the potential replacement/improvement costs an additional $700 to $800 million[5], or an additional $9,400 to $10,750 per total existing ESD.

5 Because of numerous potential conflicts and other issues that likely will be encountered during replacement, the cost for this upgrade is difficult to estimate with any reasonable accuracy at this time.

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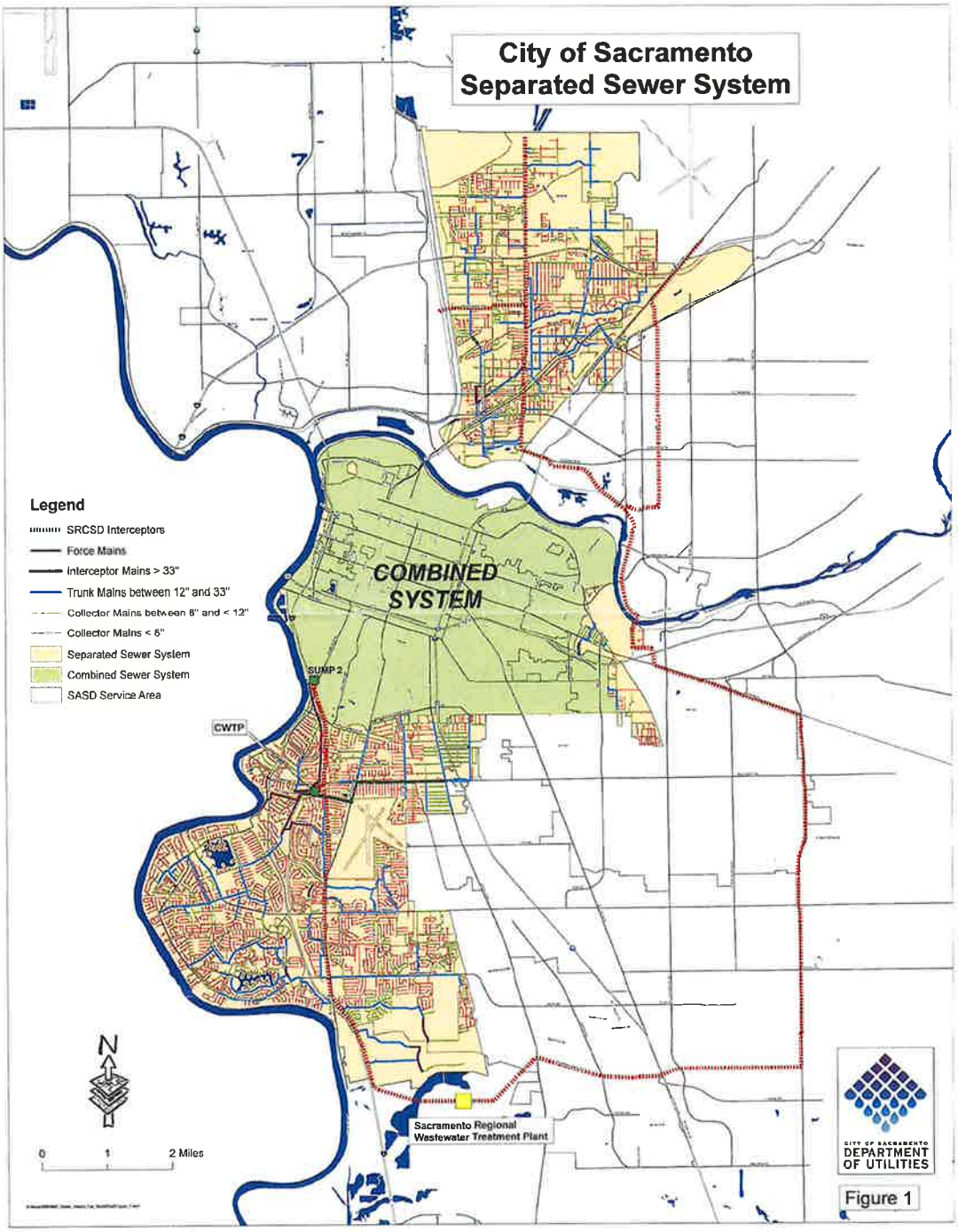

City of Sacramento
Separated Sewer System
Legend
SRCSD Interceptors
Force Mains
Interceptor Mains > 33"
Trunk Mains between 12" and 33"
Collector Mains between 8" and < 12"
Collector Mains < 8"
Separated Sewer System
Combined Sewer System
SASD Service Area
COMBINED SYSTEM
SUMP 2
CWTP
Sacramento Regional Wastewater Treatment Plant
N
0
1
2 Miles
CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES
Figure 1

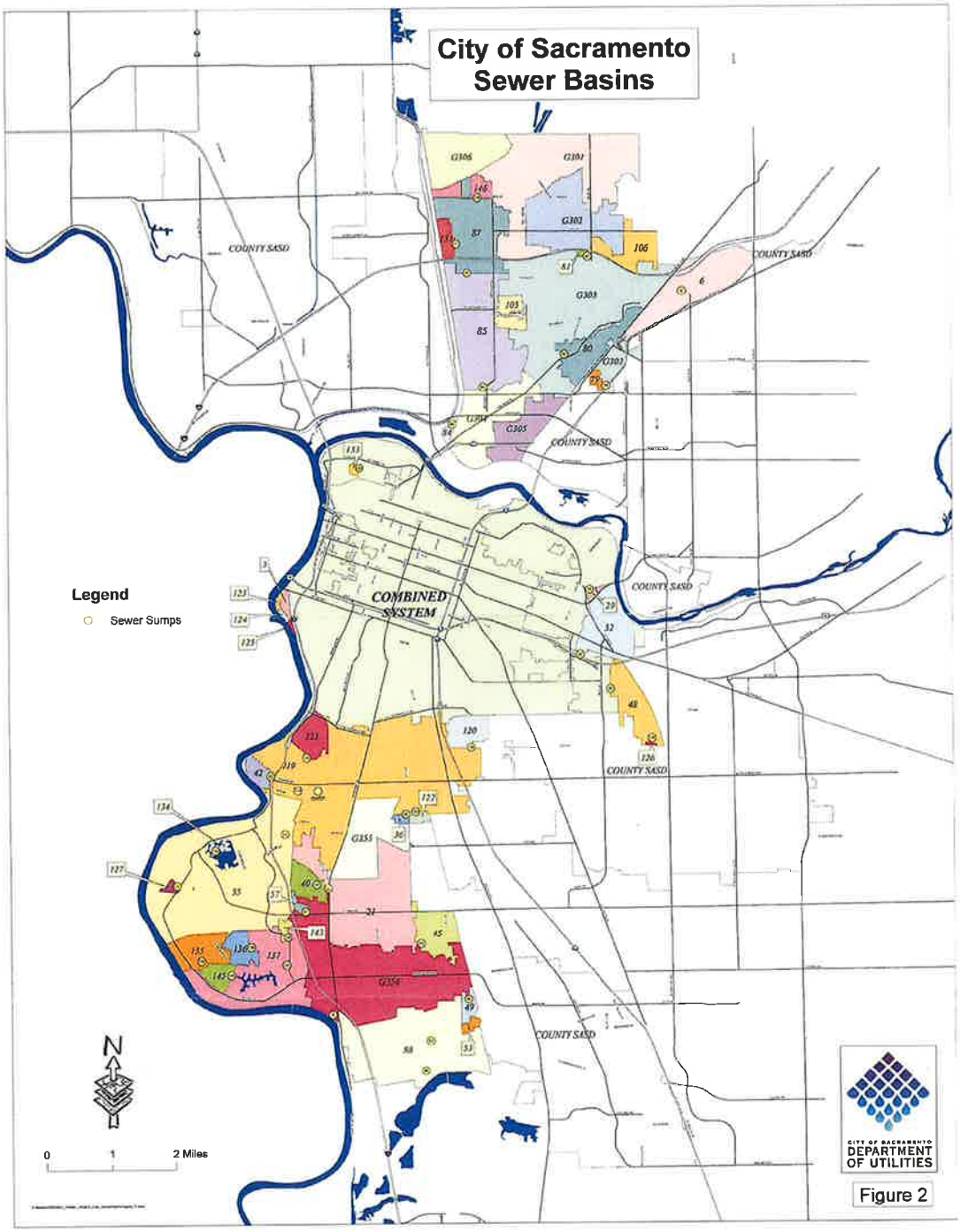

City of Sacramento
Sewer Basins
Legend
Sewer Sumps
COMBINED SYSTEM
COUNTY SASD
G306
G301
G302
G303
G305
G355
G354
0
1
2 Miles
CITY OF SACRAMENTO
DEPARTMENT OF UTILITIES

Figure 2

SUMMARY OF REPLACEMENT AND IMPROVEMENT COSTS FOR SEPARATED SEWER SYSTEM

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Basin	Est. Total ESDs			Estimated Cost to Replace Existing Sewer System[1]	Cost per Existing ESD	Estimated Improvement Costs[2]			Est. Cost to Improve & Replace System[3]			Improvement Cost/Est. Total ESD[4]			Improvement Cost/New ESD[5]		Improvement & Replacement Costs/Total ESD[6]		
	Existing Land Use	2030 Land Use	Build-out Land Use			Existing Land Use	2030 Land Use	Build-out Land Use	Existing Land Use	2030 Land Use	Build-out Land Use	Existing Land Use	2030 Land Use	Build-out Land Use	2030 Land Use	Build-out Land Use	Existing Land Use	2030 Land Use	Build-out Land Use
3, 123, 124, 125	15	15	15	$3,134,521	$208,968				$3,134,521	$3,134,521	$3,134,521						$208,968	$208,968	$208,968
6	44	44	44	$1,913,847	$43,497				$1,913,847	$1,913,847	$1,913,847						$43,497	$43,497	$43,497
21	4,504	4,526	4,579	$75,869,182	$16,845				$75,869,182	$75,869,182	$75,869,182						$16,845	$16,760	$16,569
29	95	95	95	$1,432,891	$15,083				$1,432,891	$1,432,891	$1,432,891						$15,083	$15,083	$15,083
32	545	1,137	1,581	$9,238,855	$16,952	$1,599,997	$1,606,013	$1,791,037	$9,500,770	$9,500,770	$9,508,830	$2,936	$1,415	$1,133	$2,718	$1,729	$17,433	$8,356	$6,014
36	154	155	155	$1,869,531	$12,140				$1,869,531	$1,869,531	$1,869,531						$12,140	$12,061	$12,061
40	559	561	561	$10,274,287	$18,380				$10,274,287	$10,274,287	$10,274,287						$18,380	$18,314	$18,314
42	218	218	218	$5,561,750	$25,513				$5,561,750	$5,561,750	$5,561,750						$25,513	$25,513	$25,513
45	1,426	1,577	1,868	$14,657,020	$10,419	$726,901	$876,052	$1,810,927	$14,894,261	$14,894,261	$14,967,200	$510	$556	$968	$5,802	$4,097	$10,445	$9,445	$8,012
48	1,157	1,928	2,337	$14,123,623	$12,207	$2,264,913	$3,838,692	$4,306,757	$14,285,587	$14,395,821	$14,388,820	$1,958	$1,993	$1,842	$4,992	$3,649	$12,347	$7,459	$6,157
49	277	277	277	$4,084,356	$14,745				$4,084,356	$4,084,356	$4,084,356						$14,745	$14,745	$14,745
53	145	145	145	$4,755,436	$32,796				$4,755,436	$4,755,436	$4,755,436						$32,796	$32,796	$32,796
55	10,548	10,654	10,654	$140,047,352	$13,277	$22,721,068	$22,721,068	$22,721,068	$143,500,390	$143,500,390	$143,500,390	$2,154	$2,133	$2,133	$214,350	$214,350	$13,605	$13,469	$13,469
57	80	80	80	$1,834,044	$22,926				$1,834,044	$1,834,044	$1,834,044						$22,926	$22,926	$22,926
79	192	208	240	$2,256,314	$11,752				$2,256,314	$2,256,314	$2,256,314						$11,752	$10,848	$9,401
80	1,218	1,901	2,133	$14,269,524	$11,716	$0	$1,784,248	$2,739,007	$14,269,524	$14,448,798	$14,573,760	$0	$939	$1,284	$2,612	$2,993	$11,716	$7,601	$6,833
81	18	28	28	$741,641	$41,202				$741,641	$741,641	$741,641						$41,202	$26,487	$26,487
84	110	110	110	$1,619,389	$14,722				$1,619,389	$1,619,389	$1,619,389						$14,722	$14,722	$14,722
85	3,627	4,396	5,091	$54,139,577	$14,927	$10,968,171	$12,194,978	$13,203,373	$55,448,999	$55,822,803	$56,023,183	$3,024	$2,774	$2,593	$15,858	$9,019	$15,288	$12,699	$11,004
87	2,903	3,059	3,395	$31,051,640	$10,696	$4,221,593	$4,242,560	$4,242,560	$33,367,855	$33,388,822	$33,388,822	$1,454	$1,387	$1,250	$27,196	$8,623	$11,494	$10,915	$9,835
88	Undeveloped (Future Delta Shores Development)																		
105	275	555	712	$5,246,448	$19,078				$5,246,448	$5,246,448	$5,246,448						$19,078	$9,453	$7,369
106	736	1,139	1,182	$12,801,443	$17,393	$671,836	$2,216,070	$2,782,924	$12,842,340	$13,000,300	$13,036,409	$913	$1,646	$2,354	$5,499	$6,240	$17,449	$11,414	$11,029
119	12,170	12,939	13,158	$172,258,910	$14,154	$8,303,770	$8,303,770	$8,303,770	$173,175,105	$173,175,105	$173,175,105	$682	$642	$631	$10,798	$8,405	$14,230	$13,384	$13,161
120	875	947	956	$11,305,730	$12,921				$11,305,730	$11,305,730	$11,305,730						$12,921	$11,938	$11,826
121	674	680	680	$13,854,771	$20,556	$783,355	$783,355	$783,355	$13,889,482	$13,889,482	$13,889,482	$1,162	$1,162	$1,162	$130,559	$130,559	$20,608	$20,420	$20,420
122	171	171	171	$2,446,089	$14,305				$2,446,089	$2,446,089	$2,446,089						$14,305	$14,305	$14,305
126	42	42	42	$824,271	$19,626				$824,271	$824,271	$824,271						$19,626	$19,626	$19,626
127	99	99	99	$2,306,332	$23,296				$2,306,332	$2,306,332	$2,306,332						$23,296	$23,296	$23,296
131	390	398	398	$2,265,306	$5,809				$2,265,306	$2,265,306	$2,265,306						$5,809	$5,692	$5,692
133	41	41	224	$724,562	$17,672				$724,562	$724,562	$724,562						$17,672	$17,672	$3,235
134	110	116	118	$2,498,703	$22,715				$2,498,703	$2,498,703	$2,498,703						$22,715	$21,175	$21,175
135	1,183	1,186	1,186	$17,984,615	$15,203				$17,984,615	$17,984,615	$17,984,615						$15,203	$15,037	$15,037
136	701	701	701	$10,453,873	$14,913				$10,453,873	$10,453,873	$10,453,873						$14,913	$14,913	$14,913
137	4,344	4,547	4,547	$59,824,409	$13,772	$1,306,669	$1,406,947	$1,406,947	$59,941,330	$60,041,408	$60,041,408	$301	$309	$309	$6,931	$6,931	$13,799	$13,206	$13,206
143	299	299	299	$1,640,132	$5,485				$1,640,132	$1,640,132	$1,640,132						$5,485	$5,485	$5,485
145	666	666	666	$7,466,271	$11,244				$7,466,271	$7,466,271	$7,466,271						$11,244	$11,244	$11,244
146	531	534	548	$9,774,846	$18,408				$9,774,846	$9,774,846	$9,774,846						$18,408	$18,305	$17,837
G301	2,836	5,121	10,975	$37,340,463	$13,167	$1,223,904	$2,483,583	$8,952,491	$37,441,530	$37,606,338	$39,854,627	$432	$485	$816	$1,087	$1,100	$13,202	$7,344	$3,632
G302	1,372	2,655	3,930	$18,001,040	$11,663	$5,001,410	$7,045,407	$9,809,118	$20,999,084	$21,462,156	$21,682,721	$3,039	$2,664	$2,496	$5,491	$3,835	$15,305	$8,084	$5,517
G303	7,582	8,916	9,639	$116,291,356	$15,338	$1,321,592	$2,454,649	$3,826,075	$116,398,317	$116,556,873	$116,684,990	$174	$275	$366	$1,840	$1,714	$15,352	$13,073	$12,106
G304	2,807	3,879	4,124	$36,353,295	$12,951	$2,084,752	$2,855,933	$2,855,933	$36,508,117	$36,530,425	$36,530,425	$743	$685	$644	$2,478	$2,017	$13,005	$9,417	$8,858
G305	1,532	2,826	2,902	$16,697,213	$10,899	$2,018,078	$5,398,537	$6,294,692	$16,874,877	$17,343,982	$17,421,971	$1,317	$2,056	$2,169	$4,935	$4,595	$11,015	$6,605	$6,003
G306	Flood Plain (No Existing or Future Infrastructure)																		
G354	7,175	7,730	8,298	$101,293,397	$14,118	$13,844,380	$13,854,043	$13,854,043	$102,854,462	$102,936,102	$102,936,102	$1,902	$1,792	$1,676	$24,962	$12,698	$14,335	$13,316	$12,453
G355	Executive Airport (County Maintained)																		
Total	74,446	87,111	99,139	$1,050,750,257	$913,445	$78,862,591	$93,869,105	$109,183,077	$1,066,496,319	$1,068,771,204	$1,070,710,613								
Cost/ESD					$14,114							$1,059	$1,078	$1,101	$7,412	$4,422	$14,326	$12,269	$10,800

Notes: 1) Cost includes all existing sewer infrastructure, including all collector mains, trunk mains, interceptor mains, services, pump stations, etc.

2) Includes costs to meet the capacity requirements of the "backbone" system. Does not consider costs to upgrade system to current City standards, i.e., upsizing 8 inch diameter pipe to the minimum 8 inch diameter requirement.

3) Cost to improve "backbone" pipe that does not meet capacity standards plus the cost to replace all other existing sewer infrastructure.

4) Calculated by dividing the estimated improvement costs in columns 7, 8, and 9 by the estimated total ESDs in columns 2, 3 and 4, respectively.

5) Calculated by dividing the estimated improvement costs in columns 8 and 9 by the difference in ESDs between 2030 ESDs (column 3) and the existing ESDs (column 2) and the Build Out ESDs (column 4) and the existing ESDs (column 2), respectively.

6) Calculated by dividing the estimated improvement and replacement costs in columns 10, 11 and 12 by the estimated total ESDs in columns 2, 3 and 4, respectively.

7) The combined sewer system, which comprises about 30 percent of the total City system, is excluded.

FIGURE 3

Appendix C-2

Sample Basin Improvements

Basin G303

Improvements are the net of Plate 9 minus Plate 8. ESD are current to 2022 (see **Table 3-2**) based on 2040 General Plan projections (**Table 3-1**). Costs are escalated to 2022 dollars (**Table 3-3**).

COST TO REPLACE INFRASTRUTURE WITH INADEQUATE HYDRAULIC CAPACITY
(2030 LAND USE CONDITION)

Basin G303					PM GHG Date 9/29/2009		
Item no.		Description	Est. Quantity	Units	Est. Cost		Est.Total
1		Mobilization (8%)	1	LS	$242,451		$242,451
2		Traffic Control (4%)	1	LS	$121,225		$121,225
3		Preconstruction Photographs	1	LS	$2,000		$2,000
4		Ex. Pipe to Remove, 8" Pipe to Place		LF	$165		$0
5		Ex. Pipe to Remove,10" Pipe to Place	1,705	LF	$175		$298,375
6		Ex. Pipe to Remove, 12" Pipe to Place	420	LF	$190		$79,800
7		Ex. Pipe to Remove, 15" Pipe to Place	1,850	LF	$225		$416,250
8		Ex. Pipe to Remove, 18" Pipe to Place	3,920	LF	$250		$980,000
9		Ex. Pipe to Remove, 21" Pipe to Place	720	LF	$275		$198,000
10		Ex. Pipe to Remove, 24" Pipe to Place	1,645	LF	$310		$509,950
11		Ex. Pipe to Remove, 27" Pipe to Place		LF	$345		$0
12		Ex. Pipe to Remove, 30" Pipe to Place		LF	$375		$0
13		Ex. Pipe to Remove, 33" Pipe to Place		LF	$410		$0
14		Ex. Pipe to Remove, 36" Pipe to Place		LF	$440		$0
15		Ex. Pipe to Remove, 42" Pipe to Place		LF	$510		$0
16		Manhole Rehabilitation		EA	$4,500		$0
17		Manhole Type 3	36	EA	$6,500		$234,000
18		Manhole Type 3A		EA	$7,300		$0
19		Manhole Type 4	5	EA	$9,100		$45,500
20		Saddle Manhole		EA	$14,500		$0
21		Ex. Sewer Service to Relocate/Replace	103	EA	$1,400		$143,640
22		Unsuitable Soil to Remove	3,078	TON	$35		$107,730
23		Unmarked Utility Crossing	51	EA	$300		$15,390
24		Modify/Increase Pump Station Capacity		EA			$0
25							$0
26							$0
27							$0
28							$0
29							$0
30							$0
31							$0
32							$0
					SUBTOTAL		$3,394,311
Guide		Design and Mangement		Estimate %			
4% - 10%		Construction Contingency		10			$339,431
0.5% - 5%		Environmental		1			$33,943
3% - 7%		Project Management		5			$169,716
20% - 30%		Design Engineering		20			$678,862
10% - 20%		Construction Management		10			$339,431
10% - 20%		Estimate Contingency for Undefined/Changed Scope		15			$509,147
					SUBTOTAL		$2,070,530
					TOTAL PROJECT ESTIMATE		$5,464,841

Notes:

PLATE NO. 9

COST TO REPLACE INFRASTRUCTURE WITH INADEQUATE HYDRAULIC CAPACITY (EXISTING LAND USE CONDITION)

Basin G303						PM GHG Date 9/29/2009		
Item no.		Description	Est. Quantity		Units	Est. Cost		Est.Total
1		Mobilization (8%)	1		LS	$105,451		$105,451
2		Traffic Control (4%)	1		LS	$52,725		$52,725
3		Preconstruction Photographs	1		LS	$2,000		$2,000
4		Ex. Pipe to Remove, 8" Pipe to Place			LF	$165		$0
5		Ex. Pipe to Remove,10" Pipe to Place	1,705		LF	$175		$298,375
6		Ex. Pipe to Remove, 12" Pipe to Place			LF	$190		$0
7		Ex. Pipe to Remove, 15" Pipe to Place	1,210		LF	$225		$272,250
8		Ex. Pipe to Remove, 18" Pipe to Place			LF	$250		$0
9		Ex. Pipe to Remove, 21" Pipe to Place			LF	$275		$0
10		Ex. Pipe to Remove, 24" Pipe to Place	1,645		LF	$310		$509,950
11		Ex. Pipe to Remove, 27" Pipe to Place			LF	$345		$0
12		Ex. Pipe to Remove, 30" Pipe to Place			LF	$375		$0
13		Ex. Pipe to Remove, 33" Pipe to Place			LF	$410		$0
14		Ex. Pipe to Remove, 36" Pipe to Place			LF	$440		$0
15		Ex. Pipe to Remove, 42" Pipe to Place			LF	$510		$0
16		Manhole Rehabilitation			EA	$4,500		$0
17		Manhole Type 3	18		EA	$6,500		$117,000
18		Manhole Type 3A			EA	$7,300		$0
19		Manhole Type 4			EA	$9,100		$0
20		Saddle Manhole			EA	$14,500		$0
21		Ex. Sewer Service to Relocate/Replace	46		EA	$1,400		$63,840
22		Unsuitable Soil to Remove	1,368		TON	$35		$47,880
23		Unmarked Utility Crossing	23		EA	$300		$6,840
24		Modify/Increase Pump Station Capacity			EA			$0
25								$0
26								$0
27								$0
28								$0
29								$0
30								$0
31								$0
32								$0
						SUBTOTAL		$1,476,311
Guide		Design and Mangement		Estimate %				
4% - 10%		Construction Contingency		10				$147,631
0.5% - 5%		Environmental		1				$14,763
3% - 7%		Project Management		5				$73,816
20% - 30%		Design Engineering		20				$295,262
10% - 20%		Construction Management		10				$147,631
10% - 20%		Estimate Contingency for Undefined/Changed Scope		15				$221,447
						SUBTOTAL		$900,550
						TOTAL PROJECT ESTIMATE		$2,376,861

Notes:

PLATE NO. 8

Appendix C-3

Separated Sewer Detailed Fee Schedule

Land Use	ESDs per Unit	Factor	Cost Per ESD	Fee per Unit
Residential				
Single Family Residential	1.00	Per residence	$3,461	$3,565
Apartments	0.66	Per residence	$3,461	$2,362
Duplex	0.83	Per residence	$3,461	$2,946
Triplex	0.60	Per residence	$3,461	$2,150
Fourplex	0.60	Per residence	$3,461	$2,155
Mobile Home	0.67	Per residence	$3,461	$2,395
Hotel and Motel	0.43	Per room	$3,461	$1,530
College Dorm / Boarding House	0.40	Per bed or resident	$3,461	$1,410
Residential Care/Skilled Nursing Facility	0.49	Per residence	$3,461	$1,740
Retail				
Single Retail	0.53	per 1,000 sq. ft.	$3,461	$1,889
Community Shopping Center	0.85	per 1,000 sq. ft.	$3,461	$3,040
Market	0.59	per 1,000 sq. ft.	$3,461	$2,106
Dine-In Restaurant	1.77	per 1,000 sq. ft.	$3,461	$6,322
Drive-In or Fast Food Restaurant	2.48	per 1,000 sq. ft.	$3,461	$8,848
Cocktail Lounge/Bar	1.58	per 1,000 sq. ft.	$3,461	$5,643
Coffee Shop	0.93	per 1,000 sq. ft.	$3,461	$3,331
Service Station	1.25	per 1,000 sq. ft.	$3,461	$4,460
Theatre	0.43	per 1,000 sq. ft.	$3,461	$1,538
Commercial				
Car Wash	3.64	per 0.1 acre of property	$3,461	$12,976
Clinic: Medical, Dental, Veterinarian	0.32	per 1,000 sq. ft.	$3,461	$1,127
Food Processing	3.02	per 1,000 sq. ft.	$3,461	$10,750
Store/Office Combo	0.43	per 1,000 sq. ft.	$3,461	$1,523
Auto Repair	0.18	per 1,000 sq. ft.	$3,461	$658
Auto Sales	0.70	per 1,000 sq. ft.	$3,461	$2,481
Unclassified Commercial	0.33	per 1,000 sq. ft.	$3,461	$1,170
Industrial and Warehouse				
Light Industrial	0.27	per 1,000 sq. ft.	$3,461	$951
Heavy Industrial	0.30	per 1,000 sq. ft.	$3,461	$1,058
Office Warehouse (>30% Office)	0.67	per 1,000 sq. ft.	$3,461	$2,397
Distribution Warehouse (15%-30% Office)	0.13	per 1,000 sq. ft.	$3,461	$454
Storage Warehouse (3%-14% Office)	0.08	per 1,000 sq. ft.	$3,461	$286
Mini-Storage	0.05	per 1,000 sq. ft.	$3,461	$166
Unclassified Warehouse	0.15	per 1,000 sq. ft.	$3,461	$542
Office				
Single Story	0.33	per 1,000 sq. ft.	$3,461	$1,167
Two Story	0.18	per 1,000 sq. ft.	$3,461	$648
Multi-Story	0.11	per 1,000 sq. ft.	$3,461	$398
Schools and Hospitals				
Hospital	1.62	per bed	$3,461	$5,772
Public Elementary , Middle, or Highschool	3.96	per 100 students	$3,461	$14,127
Public or Private Colleges	3.84	per acre of property	$3,461	$13,689
Private School	3.48	per acre of property	$3,461	$12,406
Church	0.22	per 1,000 sq. ft.	$3,461	$800

Sources: DOU and EPS

Appendix C-4

Companion Charts to Table 3-8

Per Unit

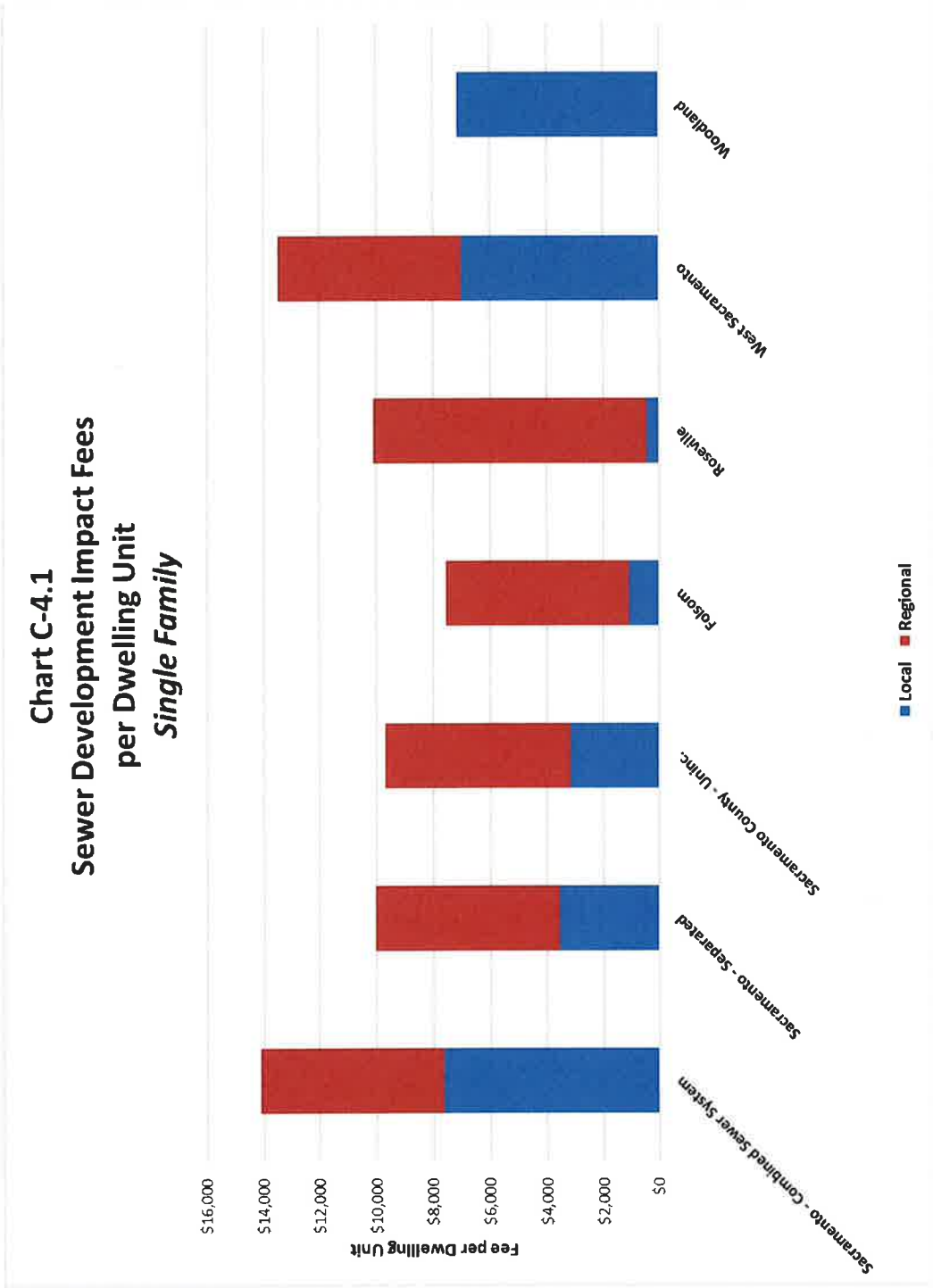


Chart C-4.2
Sewer Development Impact Fees
per 1,000 Building Square Feet
Retail

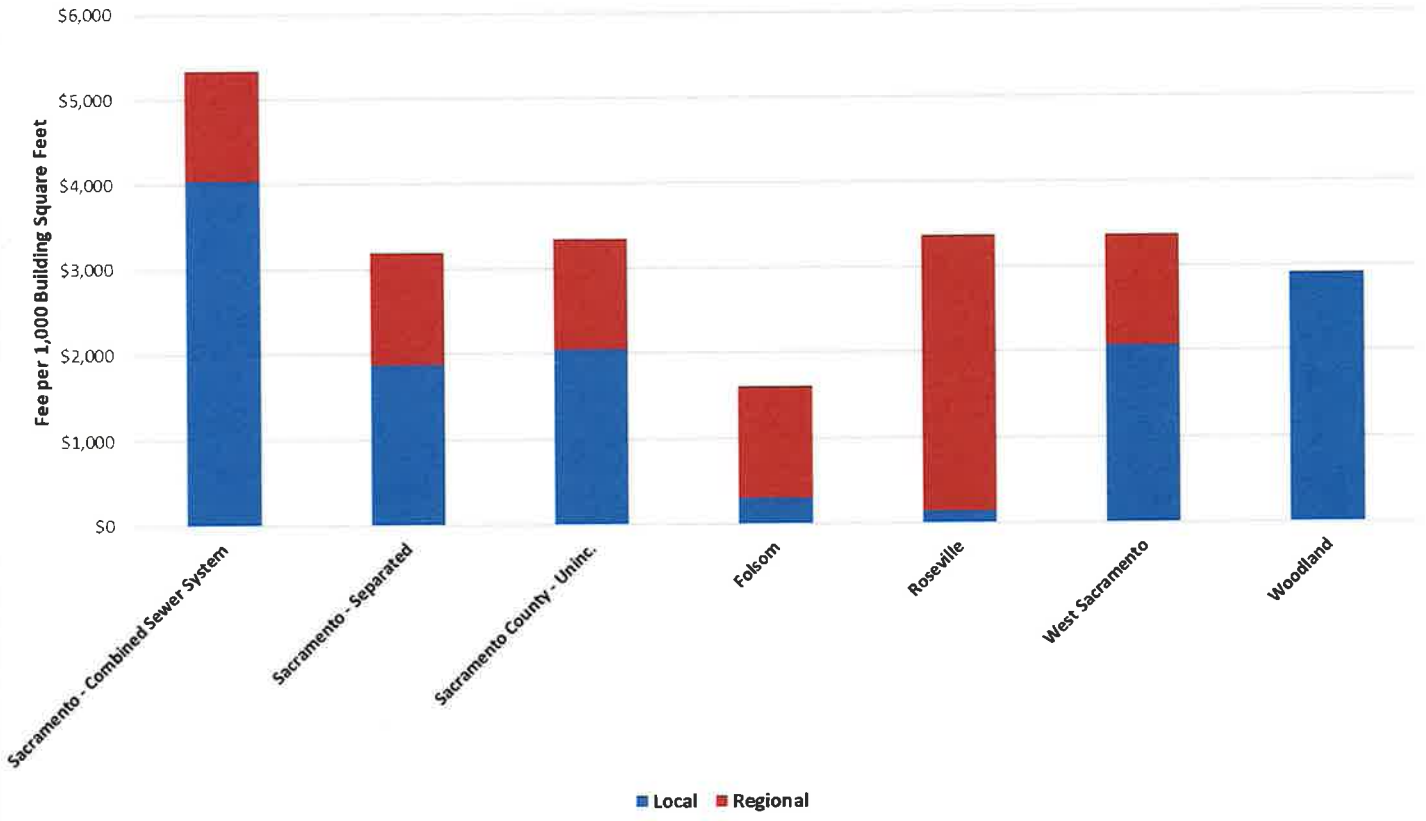
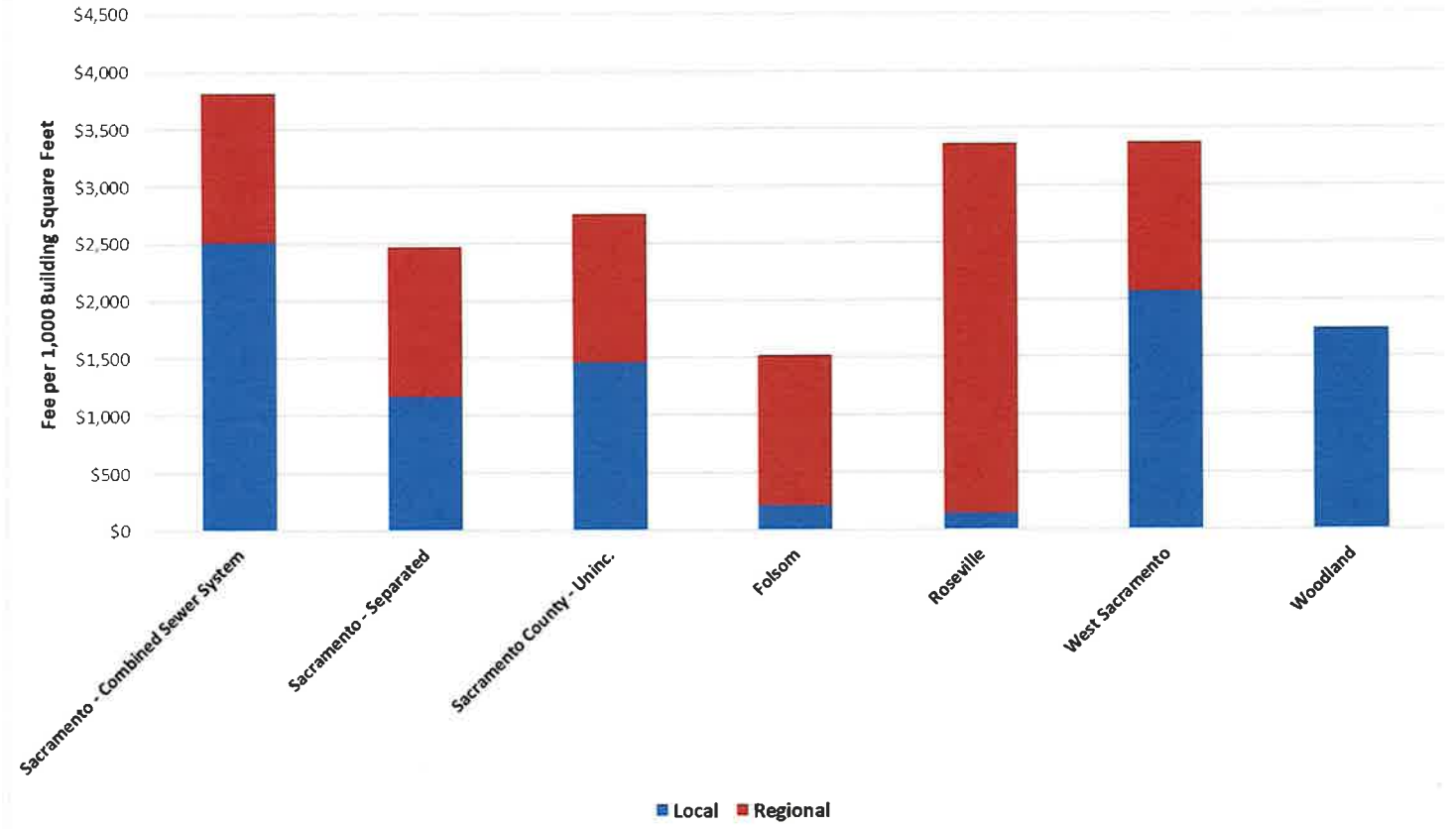


Chart C-4.3
Sewer Development Impact Fees
per 1,000 Building Square Feet
Office



Per Acre

Chart C-4.4
Sewer Development Impact Fees per Acre
Single Family

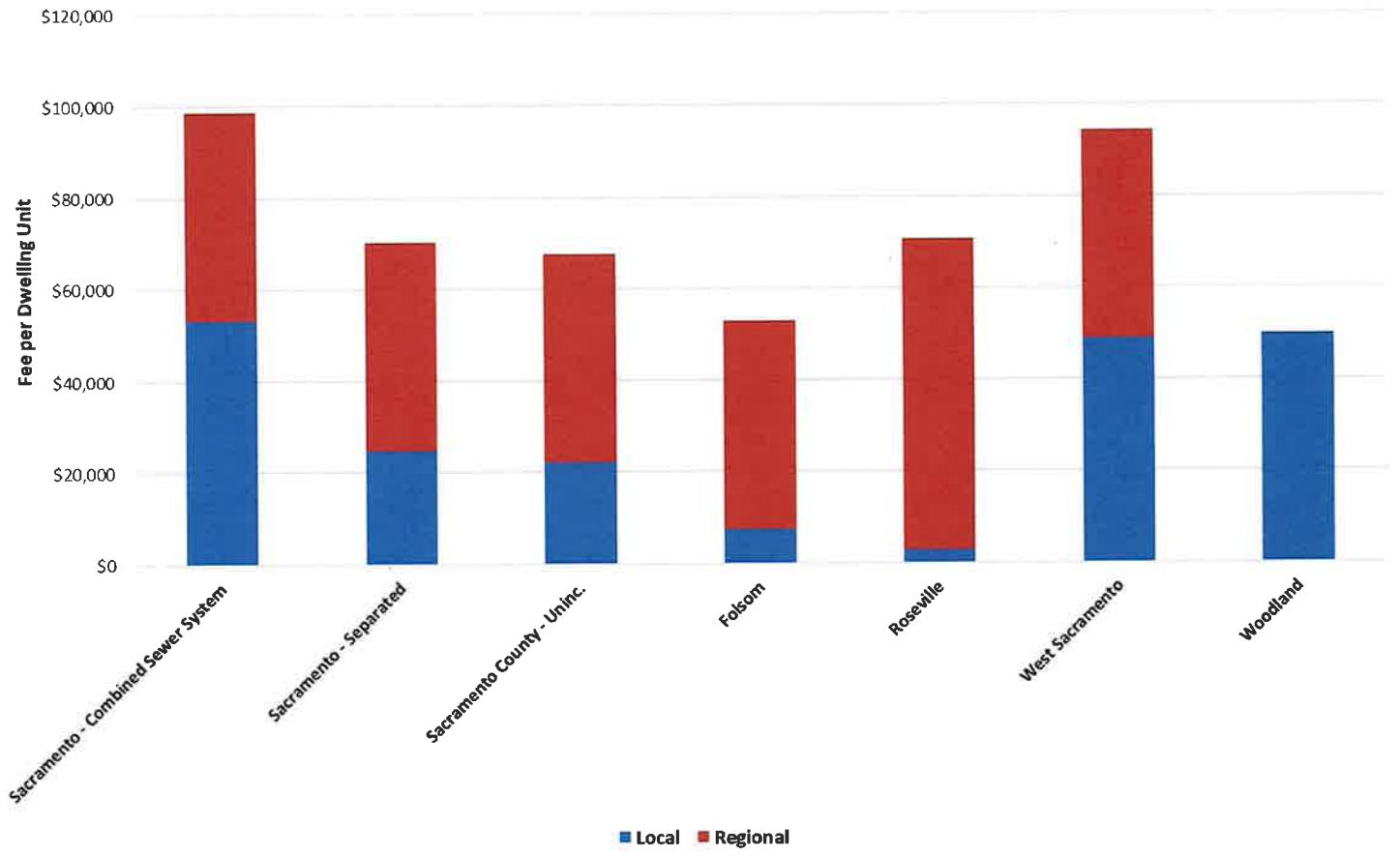


Chart C-4.5
Sewer Development Impact Fees per Acre
Retail

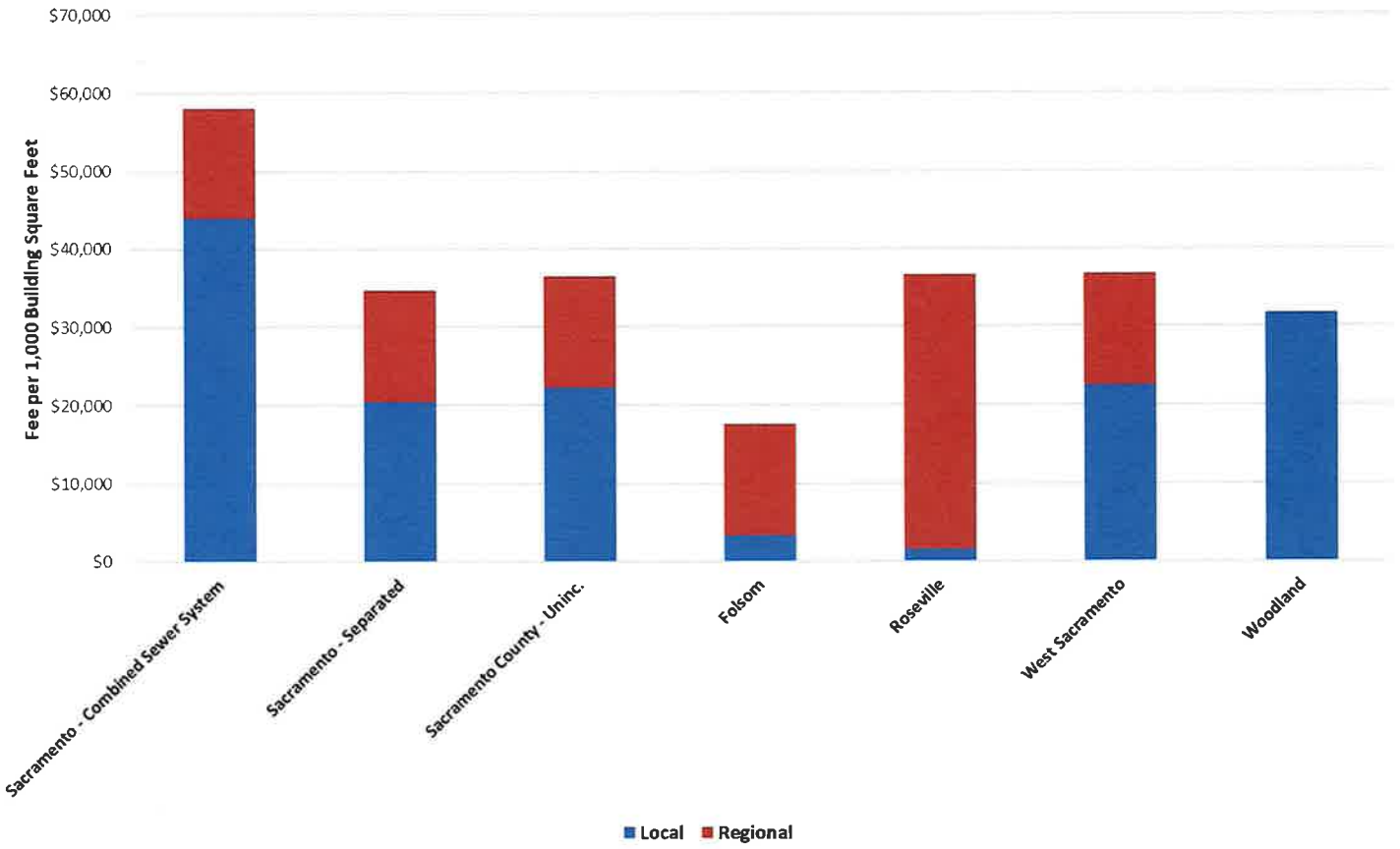
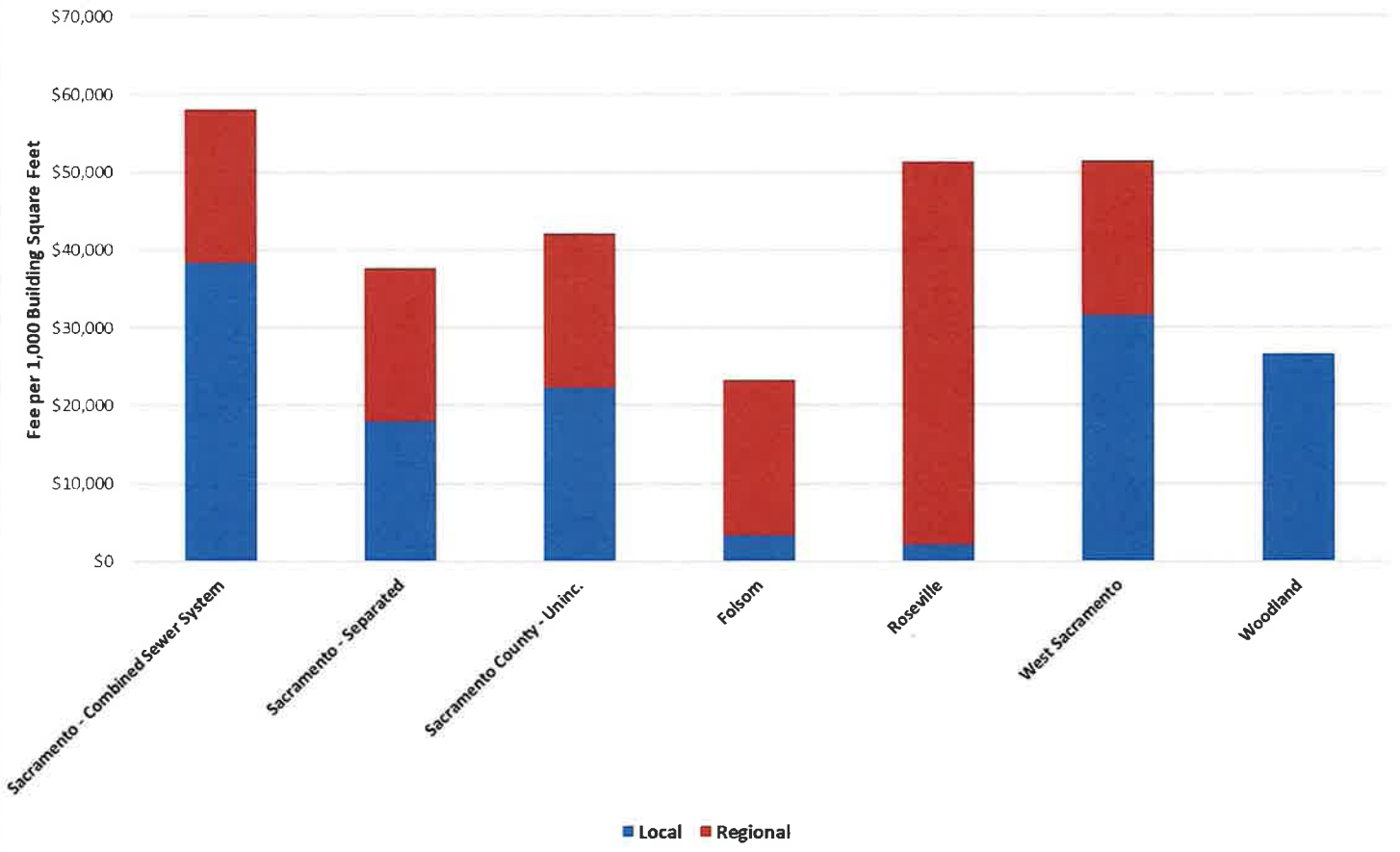


Chart C-4.6
Sewer Development Impact Fees per Acre
Office



APPENDIX D:

Combined Sewer System Utility

Appendix D-1: Detailed Fee Schedule

Appendix D-2: Fee Comparisons of Sewer Systems

Appendix D-1

Combined Sewer System Detailed Fee Schedule

All Land Uses

New Impervious Surface Cost per Square Foot	**$5.38**

Land Use	ESDs per Unit	Factor	Cost Per ESD	Fee per Unit
Residential				
Single Family Residential	1.00	Per residence	$7,413	**$7,635**
Apartments	0.66	Per residence	$7,413	**$5,060**
Duplex	0.83	Per residence	$7,413	**$6,309**
Triplex	0.60	Per residence	$7,413	**$4,605**
Fourplex	0.60	Per residence	$7,413	**$4,615**
Mobile Home	0.67	Per residence	$7,413	**$5,130**
Hotel and Motel	0.43	Per room	$7,413	**$3,276**
College Dorm / Boarding House	0.40	Per bed or resident	$7,413	**$3,019**
Residential Care/Skilled Nursing Facility	0.49	Per residence	$7,413	**$3,727**
Retail				
Single Retail	0.53	per 1,000 sq. ft.	$7,413	**$4,047**
Community Shopping Center	0.85	per 1,000 sq. ft.	$7,413	**$6,510**
Market	0.59	per 1,000 sq. ft.	$7,413	**$4,511**
Dine-In Restaurant	1.77	per 1,000 sq. ft.	$7,413	**$13,541**
Drive-In or Fast Food Restaurant	2.48	per 1,000 sq. ft.	$7,413	**$18,950**
Cocktail Lounge/Bar	1.58	per 1,000 sq. ft.	$7,413	**$12,087**
Coffee Shop	0.93	per 1,000 sq. ft.	$7,413	**$7,136**
Service Station	1.25	per 1,000 sq. ft.	$7,413	**$9,553**
Theatre	0.43	per 1,000 sq. ft.	$7,413	**$3,294**
Commercial				
Car Wash	3.64	per 0.1 acre of property	$7,413	**$27,793**
Clinic: Medical, Dental, Veterinarian	0.32	per 1,000 sq. ft.	$7,413	**$2,413**
Food Processing	3.02	per 1,000 sq. ft.	$7,413	**$23,026**
Store/Office Combo	0.43	per 1,000 sq. ft.	$7,413	**$3,261**
Auto Repair	0.18	per 1,000 sq. ft.	$7,413	**$1,410**
Auto Sales	0.70	per 1,000 sq. ft.	$7,413	**$5,313**
Unclassified Commercial	0.33	per 1,000 sq. ft.	$7,413	**$2,507**
Industrial and Warehouse				
Light Industrial	0.27	per 1,000 sq. ft.	$7,413	**$2,038**
Heavy Industrial	0.30	per 1,000 sq. ft.	$7,413	**$2,265**
Office Warehouse (>30% Office)	0.67	per 1,000 sq. ft.	$7,413	**$5,135**
Distribution Warehouse (15%-30% Office)	0.13	per 1,000 sq. ft.	$7,413	**$972**
Storage Warehouse (3%-14% Office)	0.08	per 1,000 sq. ft.	$7,413	**$613**
Mini-Storage	0.05	per 1,000 sq. ft.	$7,413	**$357**
Unclassified Warehouse	0.15	per 1,000 sq. ft.	$7,413	**$1,160**
Office				
Single Story	0.33	per 1,000 sq. ft.	$7,413	**$2,499**
Two Story	0.18	per 1,000 sq. ft.	$7,413	**$1,388**
Multi-Story	0.11	per 1,000 sq. ft.	$7,413	**$852**
Schools and Hospitals				
Hospital	1.62	per bed	$7,413	**$12,363**
Public Elementary , Middle, or Highschool	3.96	per 100 students	$7,413	**$30,257**
Public or Private Colleges	3.84	per acre of property	$7,413	**$29,320**
Private School	3.48	per acre of property	$7,413	**$26,571**
Church	0.22	per 1,000 sq. ft.	$7,413	**$1,713**

Sources: DOU and EPS

Appendix D-2

Companion Charts to Table 4-9

Per Unit

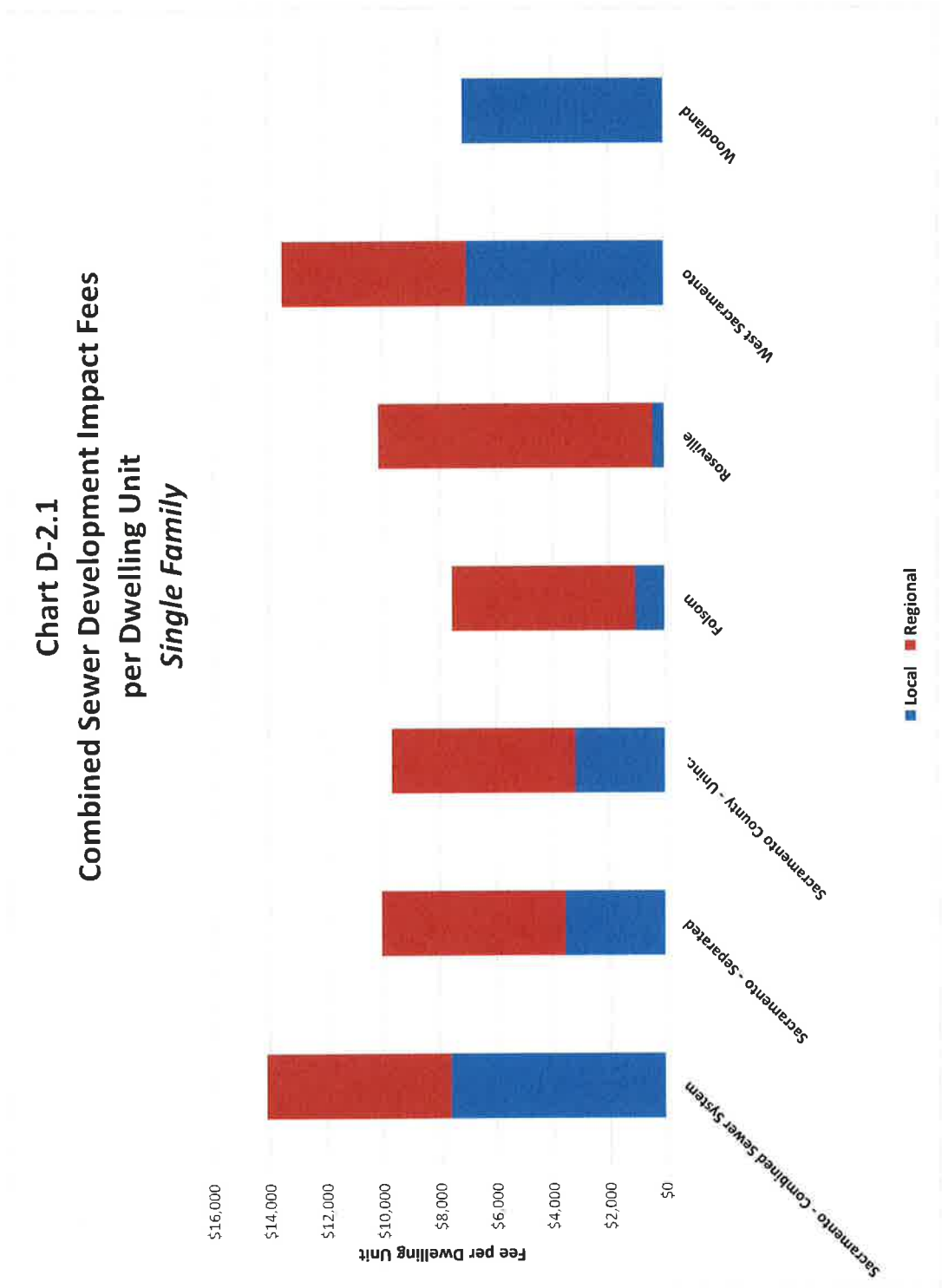


Chart D-2.2
Combined Sewer Development Impact Fees
per 1,000 Building Square Feet
Retail

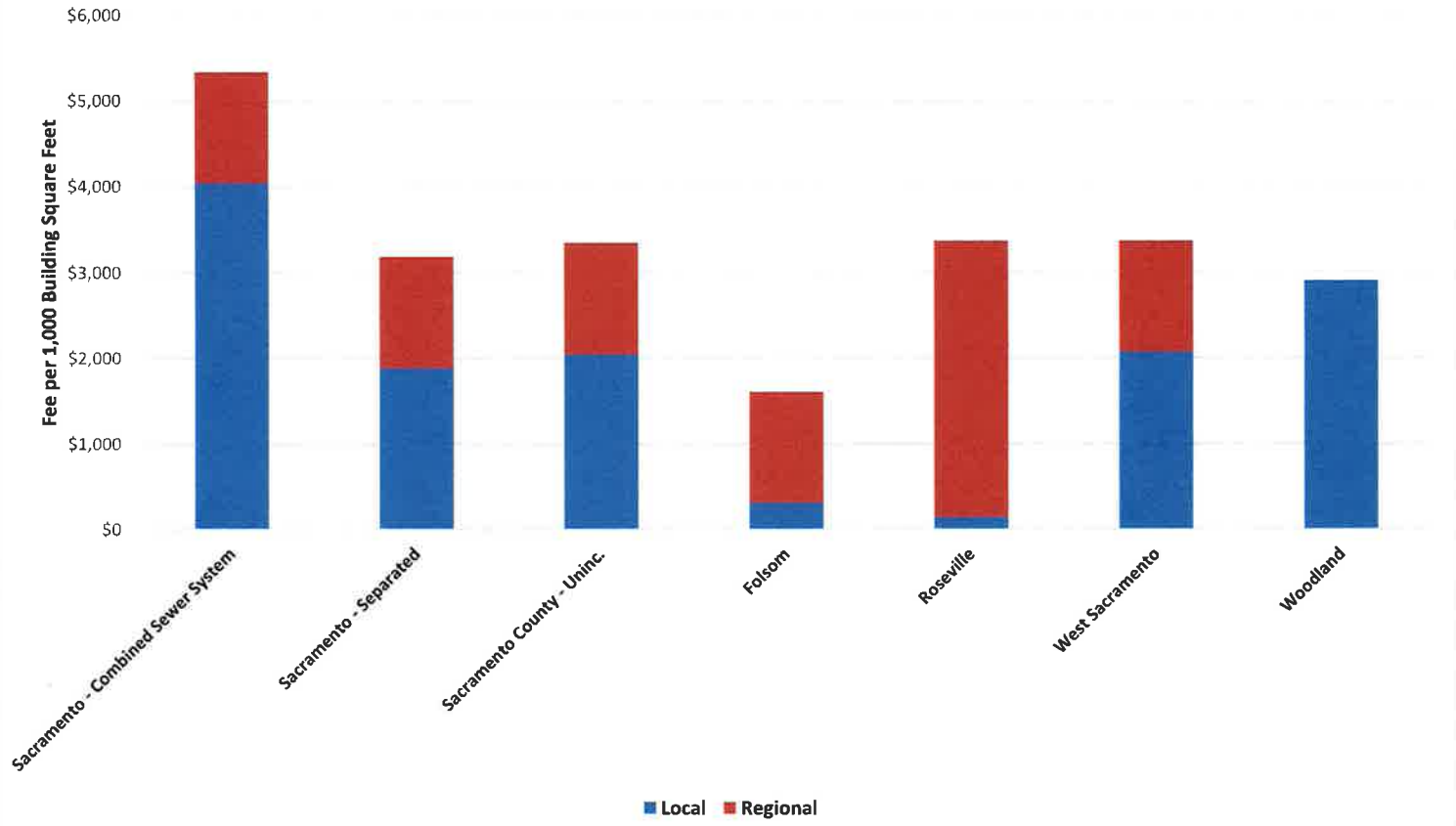
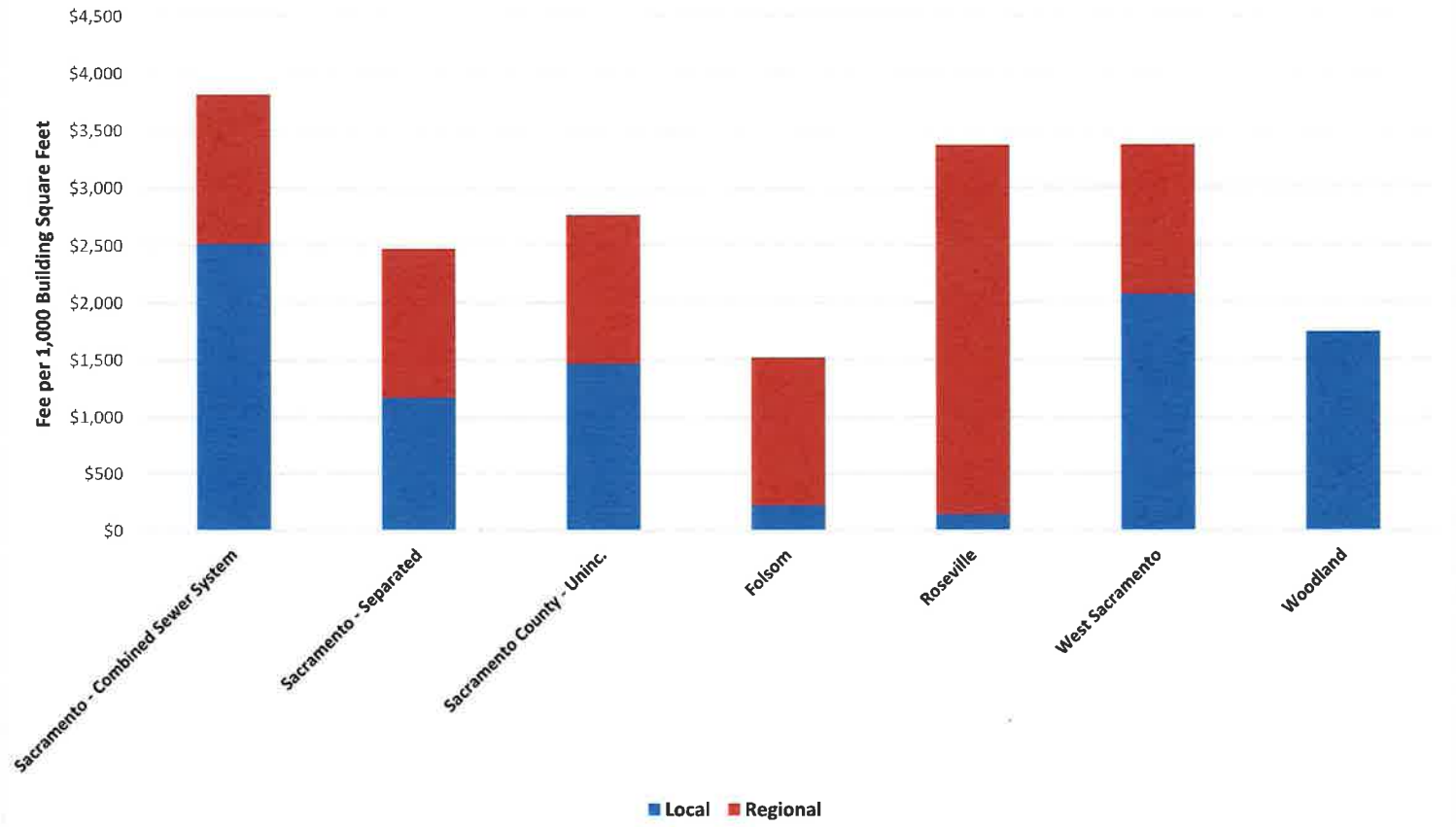


Chart D-2.3
Combined Sewer Development Impact Fees
per 1,000 Building Square Feet
Office



Per Acre

Chart D-2.4
Combined Sewer Development Impact Fees per Acre
Single Family

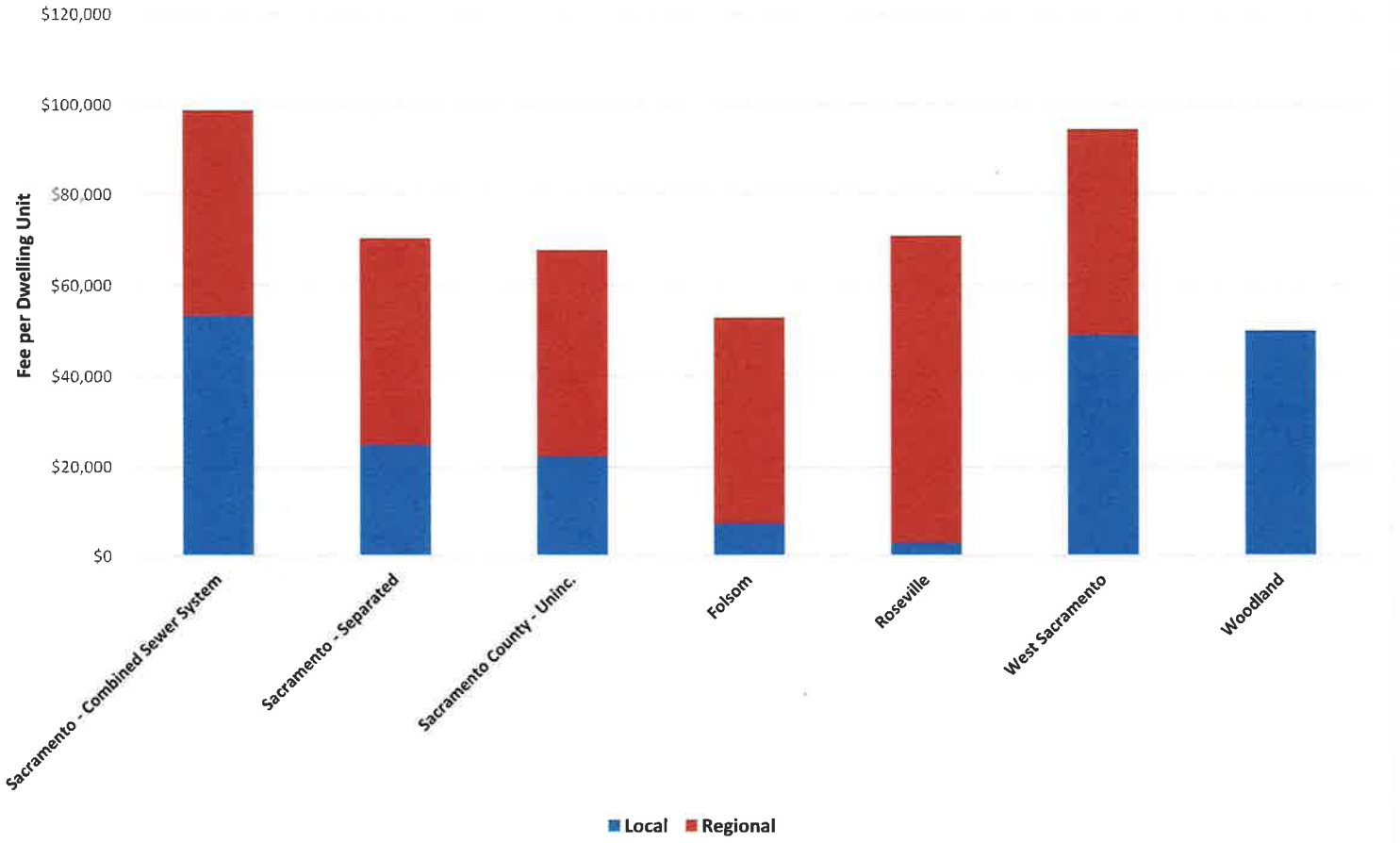


Chart D-2.5
Combined Sewer Development Impact Fees per Acre
Retail

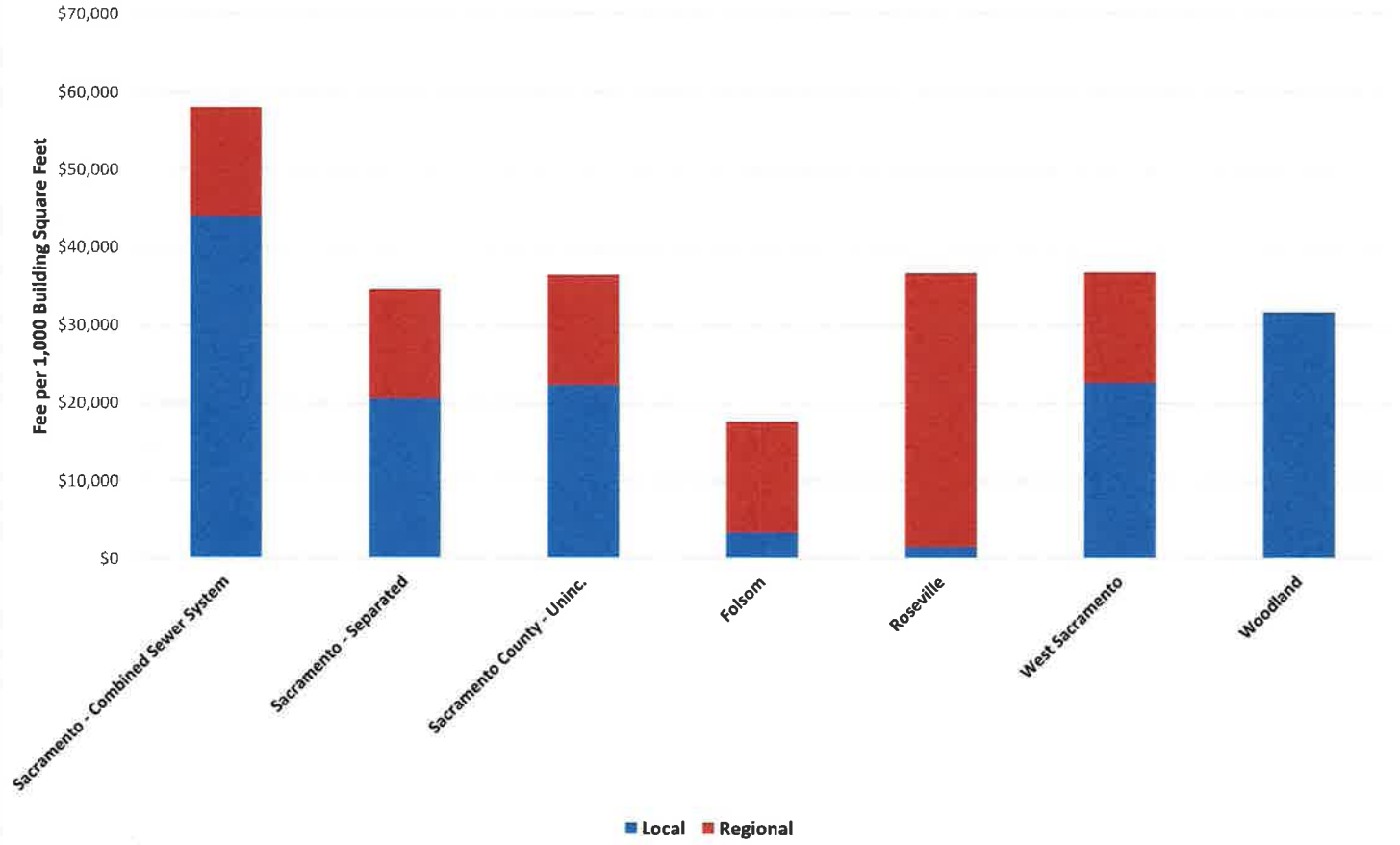
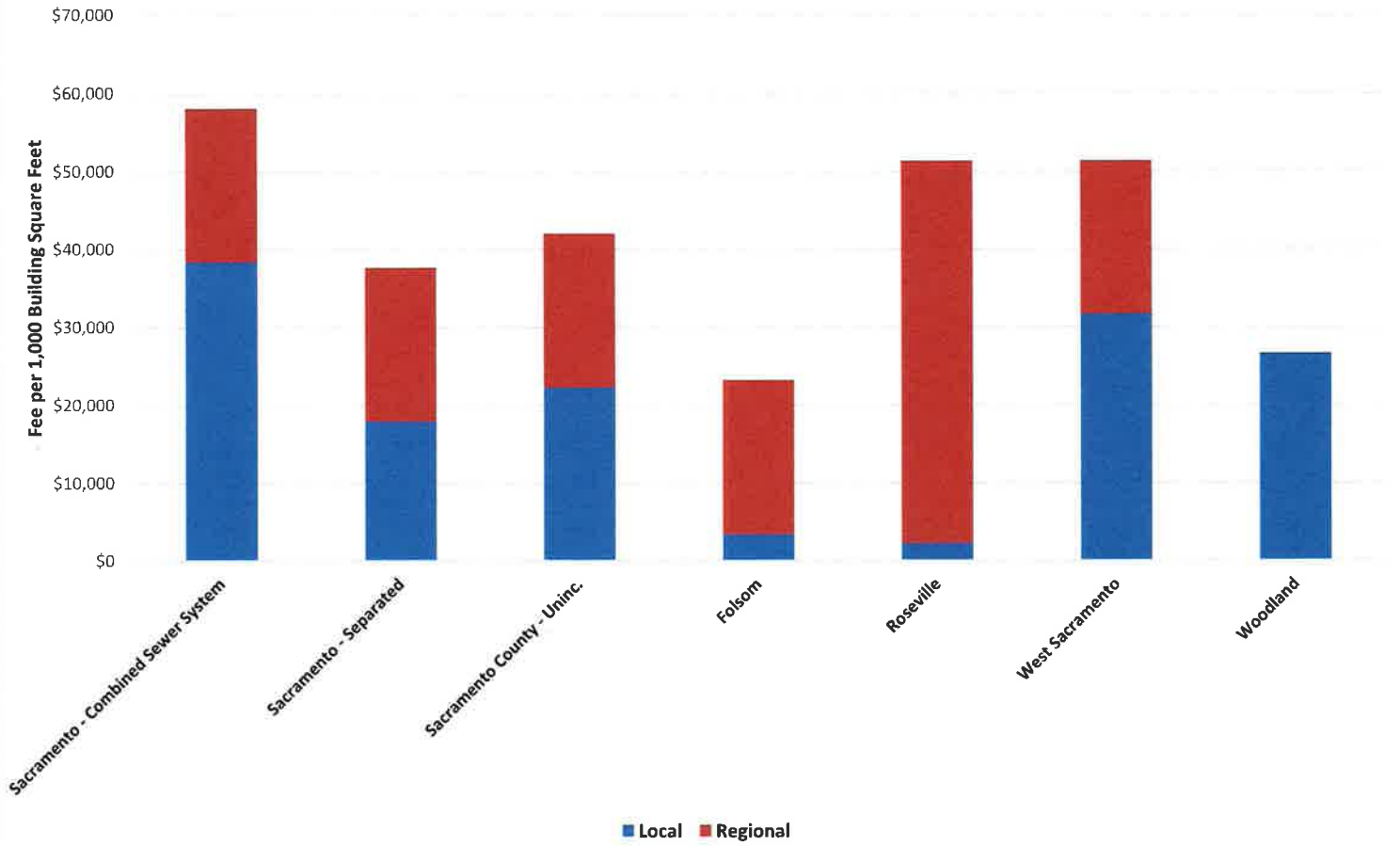


Chart D-2.6
Combined Sewer Development Impact Fees per Acre
Office



APPENDIX E:

Storm Drainage System Utility

Appendix E-1: Assets by Basins and Basin Type

Appendix E-2: Companion Charts to Table 5-10

Appendix E-1

Assets by Basins and Basin Type

Pumped Basins

Basin	Total Pipe Replacement Cost	Pipe Depreciated Asset Value	Acerage	Undeveloped Acres	Developed Acres	Total Pipe Length	Pump Station Capacity (CFS)	Pump Station Replacement Value	Pump Station 100 year life cycle value, Depreciated	Pump Station Depreciated Value	Total Basin Replacement Value	Total Basin Depreciated Value	Basin Value Per Acre	Pipe Length per Acre	Nominal Capacity (cfs/ac)	Capacity x Acerage (cfs)
8	$ 2,821,632	$ 1,100,436	215	0.00	214.69	4716	48.79	$ 2,367,663	$ 1,671,334	$ 424,759	$ 5,189,295	$ 1,525,195	$ 7,104.17	21.97	0.2	42.94
10	$ 7,292,711	$ 2,844,157	701	0.47	701.00	12035	102.49	$ 2,937,521	$ 2,073,596	$ 526,991	$ 10,230,232	$ 3,371,149	$ 4,805.83	17.16	0.15	105.22
19	$ 33,818	$ 13,189	88	9.85	77.72	74	22.28	$ 2,150,166	$ 1,517,802	$ 385,740	$ 2,183,984	$ 398,929	$ 4,555.54	0.85	0.2	17.51
22	$ 2,067,667	$ 806,390	381	0.15	381.04	3907	83.33	$ 2,714,334	$ 1,916,048	$ 486,952	$ 4,782,001	$ 1,293,342	$ 3,392.91	10.25	0.11	41.93
24	$ 3,175,061	$ 1,238,274	396	0.24	395.69	5645	66.84	$ 2,539,894	$ 1,792,911	$ 455,657	$ 5,714,955	$ 1,693,931	$ 4,278.36	14.26	0.08	31.67
25	$ 438,012	$ 170,825	65	0.00	64.89	828	66.84	$ 2,539,894	$ 1,792,911	$ 455,657	$ 2,977,906	$ 626,482	$ 9,654.52	12.76	0.12	7.79
26	$ 6,548,542	$ 2,553,931	945	1.82	943.47	11566	111.4	$ 3,048,817	$ 2,152,160	$ 546,958	$ 9,597,359	$ 3,100,889	$ 3,280.36	12.24	0.11	103.98
31	$ 9,101,759	$ 3,549,686	860	6.35	854.03	15083	80.56	$ 2,683,891	$ 1,894,558	$ 481,490	$ 11,785,650	$ 4,031,176	$ 4,685.34	17.53	0.16	137.66
33	$ 4,841,858	$ 1,888,325	718	16.92	700.66	9182	116.41	$ 3,113,490	$ 2,197,813	$ 558,560	$ 7,955,348	$ 2,446,885	$ 3,409.91	12.80	0.1	71.76
34	$ 7,671,052	$ 2,991,710	696	5.44	690.74	13468	268.25	$ 5,788,421	$ 4,086,046	$ 1,038,443	$ 13,459,473	$ 4,030,153	$ 5,788.95	19.35	0.12	83.54
35	$ 329,954	$ 128,682	52	0.00	52.25	722	45	$ 2,333,984	$ 1,647,560	$ 418,717	$ 2,663,938	$ 547,399	$ 10,476.53	13.82	0.8	41.80
37	$ 1,334,096	$ 520,297	150	0.00	150.28	2480	53.47	$ 2,410,441	$ 1,701,530	$ 432,433	$ 3,744,537	$ 952,731	$ 6,339.70	16.50	0.24	36.07
43	$ 4,950,829	$ 1,930,823	511	0.00	511.24	8077	81.63	$ 2,695,596	$ 1,902,821	$ 483,590	$ 7,646,425	$ 2,414,413	$ 4,722.66	15.80	0.1	51.12
46	$ 217,344	$ 84,764	78	4.50	73.72	408	38.1	$ 2,274,883	$ 1,605,840	$ 408,114	$ 2,492,227	$ 492,878	$ 6,301.18	5.22	0.22	17.21
50	$ 328,583	$ 128,147	83	0.00	82.90	719	25.62	$ 2,175,246	$ 1,535,506	$ 390,239	$ 2,503,829	$ 518,386	$ 6,253.15	8.67	0.15	12.44
51	$ 18,280	$ 7,129	91	0.17	90.74	40	27.16	$ 2,187,035	$ 1,543,828	$ 392,354	$ 2,205,315	$ 399,483	$ 4,396.69	0.44	0.15	13.63
52	$ 1,622,856	$ 632,914	271	1.35	269.38	3192	106.94	$ 2,992,511	$ 2,112,413	$ 536,856	$ 4,615,367	$ 1,169,770	$ 4,320.80	11.79	0.22	59.56
54	$ 564,154	$ 220,020	240	18.67	221.24	982	48.79	$ 2,367,663	$ 1,671,334	$ 424,759	$ 2,931,817	$ 644,779	$ 2,687.59	4.09	0.14	33.59
63	$ 2,116,709	$ 825,517	470	0.19	469.31	3821	71.3	$ 2,585,464	$ 1,825,079	$ 463,832	$ 4,702,173	$ 1,289,349	$ 2,746.22	8.14	0.07	32.87
65	$ 1,526,111	$ 1,375,188	296	0.00	295.99	5047	60.16	$ 2,473,874	$ 1,746,308	$ 443,813	$ 5,999,985	$ 1,818,996	$ 6,145.47	17.05	0.07	20.72
66	$ 2,405,068	$ 937,977	492	0.53	490.99	4660	202.53	$ 4,460,767	$ 3,148,856	$ 800,262	$ 6,865,835	$ 1,738,238	$ 3,536.45	9.48	0.27	132.71
67	$ 5,432,847	$ 2,118,810	881	7.14	874.13	10251	167.77	$ 3,863,391	$ 2,727,167	$ 693,092	$ 9,296,238	$ 2,811,903	$ 3,190.74	11.63	0.12	105.75
68	$ 1,003,361	$ 391,311	303	0.00	303.42	1865	83.55	$ 2,716,772	$ 1,917,769	$ 487,389	$ 3,720,133	$ 878,700	$ 2,895.98	6.15	0.15	45.51
69	$ 6,979,511	$ 2,722,009	1052	0.00	1051.50	13175	184.48	$ 4,141,512	$ 2,923,493	$ 742,987	$ 11,121,023	$ 3,464,996	$ 3,295.29	12.53	0.11	115.67
70	$ 918,344	$ 358,154	213	0.69	212.64	1736	43.67	$ 2,322,370	$ 1,639,361	$ 416,633	$ 3,240,714	$ 774,787	$ 3,631.87	8.14	0.1	21.33
71	$ 48,899	$ 19,071	228	0.25	227.58	107	6.88	$ 2,043,191	$ 1,442,288	$ 366,548	$ 2,092,090	$ 385,619	$ 1,692.57	0.47	0.12	27.34
91	$ 2,798,914	$ 1,091,576	482	0.00	481.71	5194	125.66	$ 3,236,857	$ 2,284,897	$ 580,692	$ 6,035,771	$ 1,672,269	$ 3,471.53	10.78	0.17	81.89
92	$ 7,565,110	$ 2,950,393	1138	2.39	1135.88	13138	171.56	$ 3,925,002	$ 2,770,659	$ 704,145	$ 11,490,112	$ 3,654,538	$ 3,210.61	11.54	#N/A	#N/A
95	$ 3,993,436	$ 1,557,440	489	0.31	488.58	6892	213.22	$ 4,659,066	$ 3,288,835	$ 835,836	$ 8,652,502	$ 2,393,277	$ 4,895.33	14.10	0.29	141.78
96	$ 14,246,044	$ 5,555,957	1071	33.31	1037.48	24520	325.29	$ 7,150,895	$ 5,047,817	$ 1,282,871	$ 21,396,939	$ 6,838,828	$ 6,386.71	22.90	0.2	214.16
97	$ 3,070,912	$ 1,197,656	375	16.33	359.01	5980	125.21	$ 3,230,736	$ 2,280,577	$ 579,594	$ 6,301,648	$ 1,777,250	$ 4,735.04	15.93	0.2	75.07
98	$ 4,154,912	$ 1,620,416	632	4.88	626.63	7376	187.15	$ 4,187,504	$ 2,955,959	$ 751,238	$ 8,342,416	$ 2,371,654	$ 3,755.53	11.68	0.19	119.99
99	$ 7,531,530	$ 2,937,297	386	0.60	385.07	12522	198.07	$ 4,380,063	$ 3,091,886	$ 785,783	$ 11,911,593	$ 3,723,080	$ 9,654.79	32.47	0.3	115.69
101	$ 9,601,580	$ 3,744,616	544	4.75	538.80	15668	183.94	$ 4,132,262	$ 2,916,964	$ 741,328	$ 13,733,842	$ 4,485,944	$ 8,253.05	28.83	0.19	103.27
102	$ 3,298,696	$ 1,286,491	406	13.62	392.27	6136	95.8	$ 2,857,088	$ 2,016,818	$ 512,562	$ 4,155,784	$ 1,799,053	$ 4,432.37	15.12	0.18	73.06
103	$ 1,891,204	$ 737,570	269	9.73	259.69	3592	84.33	$ 2,725,437	$ 1,923,886	$ 488,943	$ 4,616,641	$ 1,226,513	$ 4,552.42	13.33	0.15	40.41
104	$ 12,956,492	$ 5,053,032	871	2.42	868.89	17776	558.86	$ 14,767,371	$ 10,424,787	$ 2,649,266	$ 27,723,863	$ 7,702,298	$ 8,839.91	19.83	0.3	261.39
109	$ 219,006	$ 85,412	110	0.00	110.22	414	45.9	$ 2,341,904	$ 1,653,150	$ 420,138	$ 2,560,910	$ 505,550	$ 4,586.73	3.76	0.18	19.84
110	$ 105,395	$ 41,104	256	2.10	254.37	107	0	$ 2,000,000	$ 1,411,800	$ 358,800	$ 2,105,395	$ 399,904	$ 1,691.14	0.45	0.07	16.55
111	$ 4,518,115	$ 1,762,065	452	10.81	441.49	7723	207.65	$ 4,554,887	$ 3,215,295	$ 817,147	$ 9,073,002	$ 2,579,212	$ 5,702.44	17.07	0.3	135.69
115	$ 526,710	$ 205,417	150	0.00	150.03	1038	69.07	$ 2,562,529	$ 1,808,889	$ 459,718	$ 3,089,239	$ 665,135	$ 4,433.34	6.92	0.24	36.01
116	$ 543,319	$ 211,902	225	0.00	225.18	1179	68.18	$ 2,553,460	$ 1,802,487	$ 458,091	$ 3,096,799	$ 669,993	$ 2,975.37	5.24	0.2	45.04
117	$ 1,888,556	$ 736,537	206	11.84	193.83	3512	36.34	$ 2,260,265	$ 1,595,521	$ 405,492	$ 4,148,821	$ 1,142,028	$ 5,552.72	17.08	0.2	41.13
128	$ 6,388,545	$ 2,491,533	648	0.90	647.07	10557	159.08	$ 3,725,379	$ 2,629,745	$ 668,333	$ 10,113,924	$ 3,159,866	$ 4,876.56	16.29	0.18	116.63
129	$ 14,055,244	$ 5,481,545	1434	0.00	1433.78	20752	572.37	$ 15,308,109	$ 10,805,994	$ 2,746,275	$ 29,363,353	$ 8,227,820	$ 5,738.55	14.47	0.3	430.13
130	$ 3,701,015	$ 1,443,396	503	10.35	492.92	7151	217.23	$ 4,735,221	$ 3,342,592	$ 849,499	$ 8,436,236	$ 2,292,894	$ 4,555.99	14.21	0.28	140.92
132	$ 10,838,214	$ 4,226,903	2057	5.17	2052.32	20166	1256.59	$ 57,023,247	$ 40,252,710	$ 10,229,971	$ 67,861,461	$ 14,456,874	$ 7,026.46	9.80	0.3	617.25
138	$ 1,509,859	$ 588,845	196	0.54	195.60	2875	51.24	$ 2,389,894	$ 1,687,026	$ 428,747	$ 3,899,753	$ 1,017,592	$ 5,188.09	14.66	0.14	27.46
139	$ 1,172,549	$ 457,294	216	0.00	215.64	2285	66.17	$ 2,533,151	$ 1,788,151	$ 454,447	$ 3,705,700	$ 911,741	$ 4,228.07	10.60	0.17	36.66

140	$ 2,958,418	$ 1,153,783	462	34.55	427.66	5710	178.24	$ 4,035,692	$ 2,848,795	$ 724,003	$ 6,994,110	$ 1,877,786	$ 4,062.63	12.35	0.21	97.06
141	$ 3,437,029	$ 1,340,441	407	25.52	381.07	6997	196.04	$ 4,343,725	$ 3,066,235	$ 779,264	$ 7,780,754	$ 2,119,706	$ 5,213.37	17.21	0.3	121.98
142	$ 1,260,343	$ 491,534	107	0.88	105.82	2551	49.02	$ 2,369,735	$ 1,672,796	$ 425,130	$ 3,630,078	$ 916,664	$ 8,591.04	23.91	0.25	26.68
144	$ 6,986,162	$ 2,724,603	525	26.88	497.92	11606	259.78	$ 5,602,758	$ 3,954,987	$ 1,005,135	$ 12,588,920	$ 3,729,738	$ 7,106.97	22.12	0.31	162.69
147	$ 985,749	$ 384,442	40	2.23	37.94	2157	13.59	$ 2,088,051	$ 1,473,955	$ 374,596	$ 3,073,800	$ 759,038	$ 18,895.66	53.70	0.1	4.02
148	$ 1,717,966	$ 670,007	162	0.00	162.44	3190	92.46	$ 2,817,937	$ 1,989,182	$ 505,538	$ 4,535,903	$ 1,175,545	$ 7,236.79	19.64	0.37	60.10
151	$ 15,362,753	$ 5,991,474	998	20.17	977.88	27149	348.46	$ 7,760,123	$ 5,477,871	$ 1,392,166	$ 23,122,876	$ 7,383,640	$ 7,398.07	27.20	0.26	259.49
152	$ 13,136,994	$ 5,123,428	1596	2.71	1593.09	16746	548.53	$ 14,361,303	$ 10,137,644	$ 2,576,418	$ 27,498,297	$ 7,699,845	$ 4,825.07	10.49	0.23	367.03
153	$ 440,409	$ 171,760	243	3.46	239.48	849	75.31	$ 2,627,455	$ 1,854,721	$ 471,365	$ 3,067,864	$ 643,125	$ 2,647.26	3.49	0.14	34.01
154	$ 5,069,631	$ 1,977,156	653	14.94	637.87	9543	119.2	$ 3,150,159	$ 2,223,697	$ 565,139	$ 8,219,790	$ 2,542,295	$ 3,894.39	14.62	0.13	84.87
155	$ 1,849,207	$ 721,191	127	1.75	125.50	3055	143.17	$ 3,484,451	$ 2,459,674	$ 625,110	$ 5,333,658	$ 1,346,301	$ 10,579.97	24.01	0.26	33.09
157	$ 11,074,353	$ 4,318,998	2273	72.30	2200.49	21993	777.13	$ 24,845,102	$ 17,538,157	$ 4,457,211	$ 35,919,455	$ 8,776,209	$ 3,861.43	9.68	0.2	454.56
158	$ 5,905,668	$ 2,303,211	465	48.55	416.04	10992	99.15	$ 2,897,029	$ 2,045,012	$ 519,727	$ 8,802,697	$ 2,822,937	$ 6,076.19	23.66	0.1	46.46
159	$ 1,345,529	$ 524,756	615	19.63	595.81	2609	94.36	$ 2,840,126	$ 2,004,845	$ 509,519	$ 4,185,655	$ 1,034,275	$ 1,680.55	4.24	0.05	30.77
160	$ 9,025,750	$ 3,520,043	544	0.00	544.38	15214	382.99	$ 8,727,849	$ 6,160,989	$ 1,565,776	$ 17,753,599	$ 5,085,819	$ 9,342.41	27.95	0.46	250.41
Totals	**$ 272,920,396**	**$ 106,438,954**	**32789**	**478.30**	**32311**	**470200**	**10611**	**$ 323,120,611**	**$ 228,890,839**	**$ 57,967,838**	**$ 596,041,047**	**$ 164,486,792**	**$ 5,014.03**	**14.34**		**6334.55**
														Weighted Average (cfs/ac)=		0.19

Basin	Total Pipe Replacement Cost	Pipe Depreciated Asset Value	Basin Acres	Undeveloped Acres	Developed Acres	Total Pipe Length	Basin Replacement Value per Acre	Depreciated Basin Value Per Acre	Pipe /Acre	Comments	Nominal Capacity (cfs/ac)	Capacity x Acerage (cfs)
G200	$ 3,308,651	$ 1,290,374	541.00	0.00	541.00	6,287	$ 6,115.81	$ 2,385.16	11.62		0.2	108.20
G201	$ 7,712,003	$ 3,007,681	1,596.97	21.81	1,575.16	14,651	$ 4,829.15	$ 1,883.37	9.17		0.2	319.39
G206	$ -	$ -	347.13	0.00	347.13	14,181	$ -	$ -	40.85	CFD	NN	#VALUE!
G207	$ -	$ -	456.36	0.21	456.15	22,267	$ -	$ -	48.79	CFD	NN	#VALUE!
G208	$ -	$ -	409.12	0.00	409.12	13,802	$ -	$ -	33.74	CFD	NN	#VALUE!
G209	$ 4,156,868	$ 1,621,179	910.98	0.00	910.98	5,204	$ 4,563.07	$ 1,779.60	5.71		0.1	91.10
G248	$ 722,714	$ 281,858	321.25	31.64	289.61	1,514	$ 2,249.69	$ 877.38	4.71		0	0.00
G252	$ 17,627,343	$ 6,874,664	1,221.39	35.46	1,185.93	30,471	$ 14,432.20	$ 5,628.56	24.95		0.08	97.71
G254	$ 840,846	$ 327,930	684.79	0.00	684.79	1,434	$ 1,227.89	$ 478.88	2.09		0.12	82.17
G258	$ 3,641,029	$ 1,420,001	551.48	43.21	508.27	6,829	$ 6,602.29	$ 2,574.89	12.38		0.2	110.30
G259	$ 8,978,574	$ 3,501,644	753.94	0.00	753.94	16,470	$ 11,908.87	$ 4,644.46	21.85		0.2	150.79
G260	$ 1,193,830	$ 465,594	145.96	0.00	145.96	2,170	$ 8,179.16	$ 3,189.87	14.87		0.2	29.19
G269	$ 3,894,637	$ 1,518,908	194.30	19.27	175.03	6,229	$ 20,044.45	$ 7,817.34	32.06		0.48	93.26
G270	$ 3,629,641	$ 1,415,560	729.31	10.85	718.46	6,601	$ 4,976.82	$ 1,940.96	9.05		0.17	123.98
G273	$ 7,034,482	$ 2,743,448	371.16	20.66	350.50	13,186	$ 18,952.69	$ 7,391.55	35.53		0.5	185.58
Totals	$ 62,740,618	$ 24,468,841	8,134.67	151.60	7,983.07	161,296	**$ 7,712.74**	**$ 3,007.97**	**Weighted Average (cfs/ac) =**			0.17

Appendix E-2

Companion Charts to Table 5-10

Charts per Unit

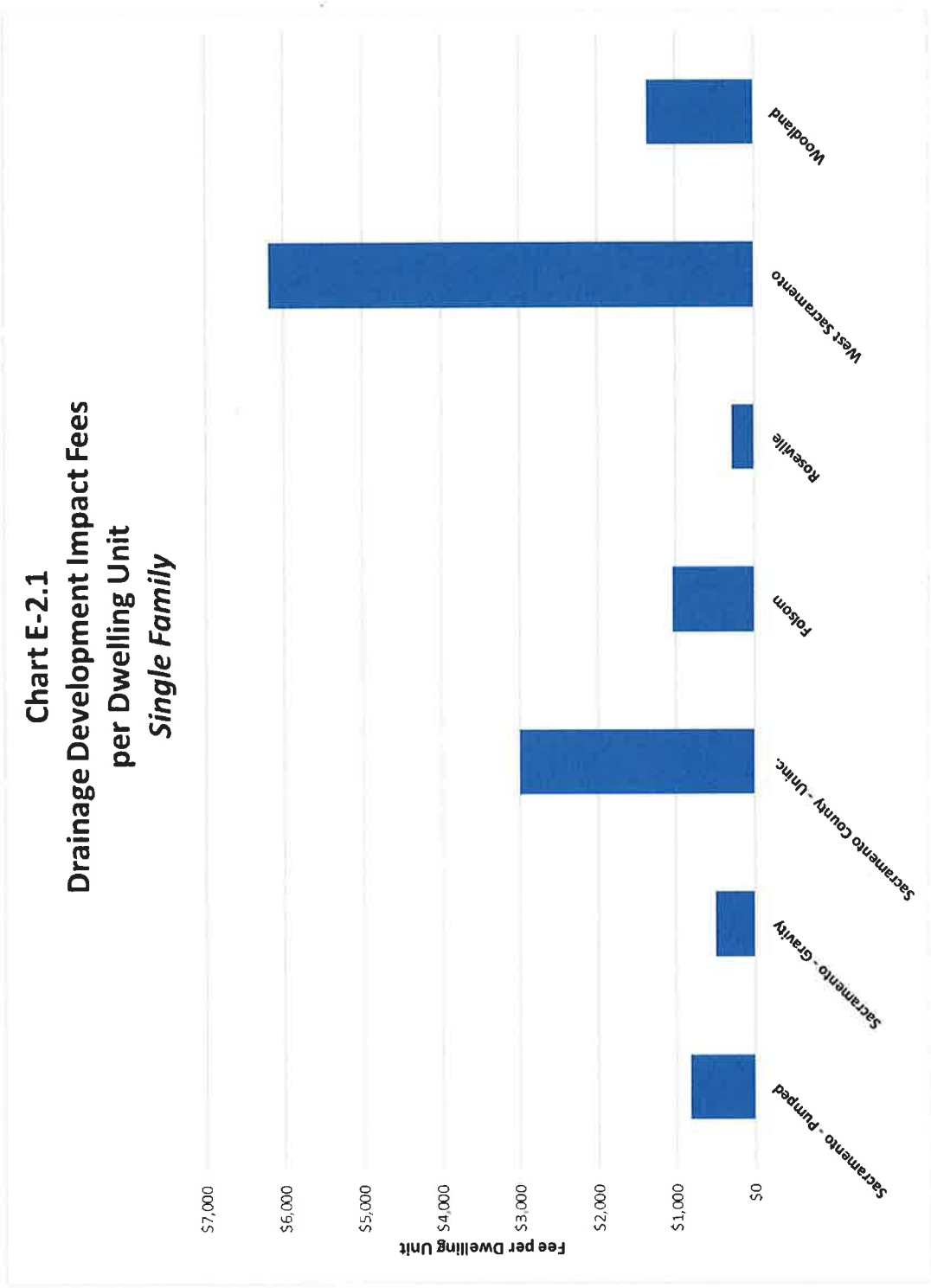


Chart E-2.2
Drainage Development Impact Fees
per 1,000 Building Square Feet
Retail

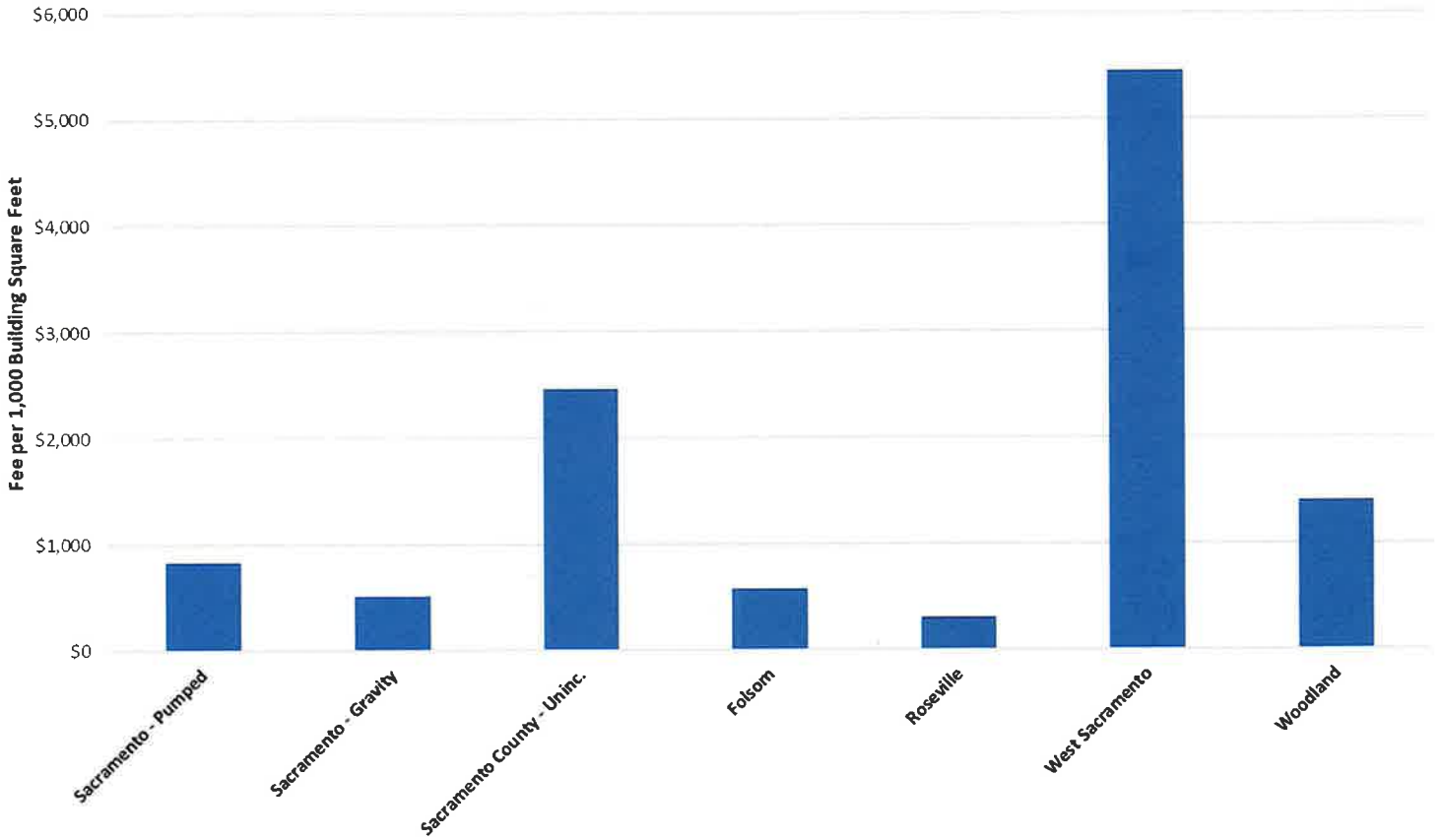


Chart E-2.3
Drainage Development Impact Fees
per 1,000 Building Square Feet
Office

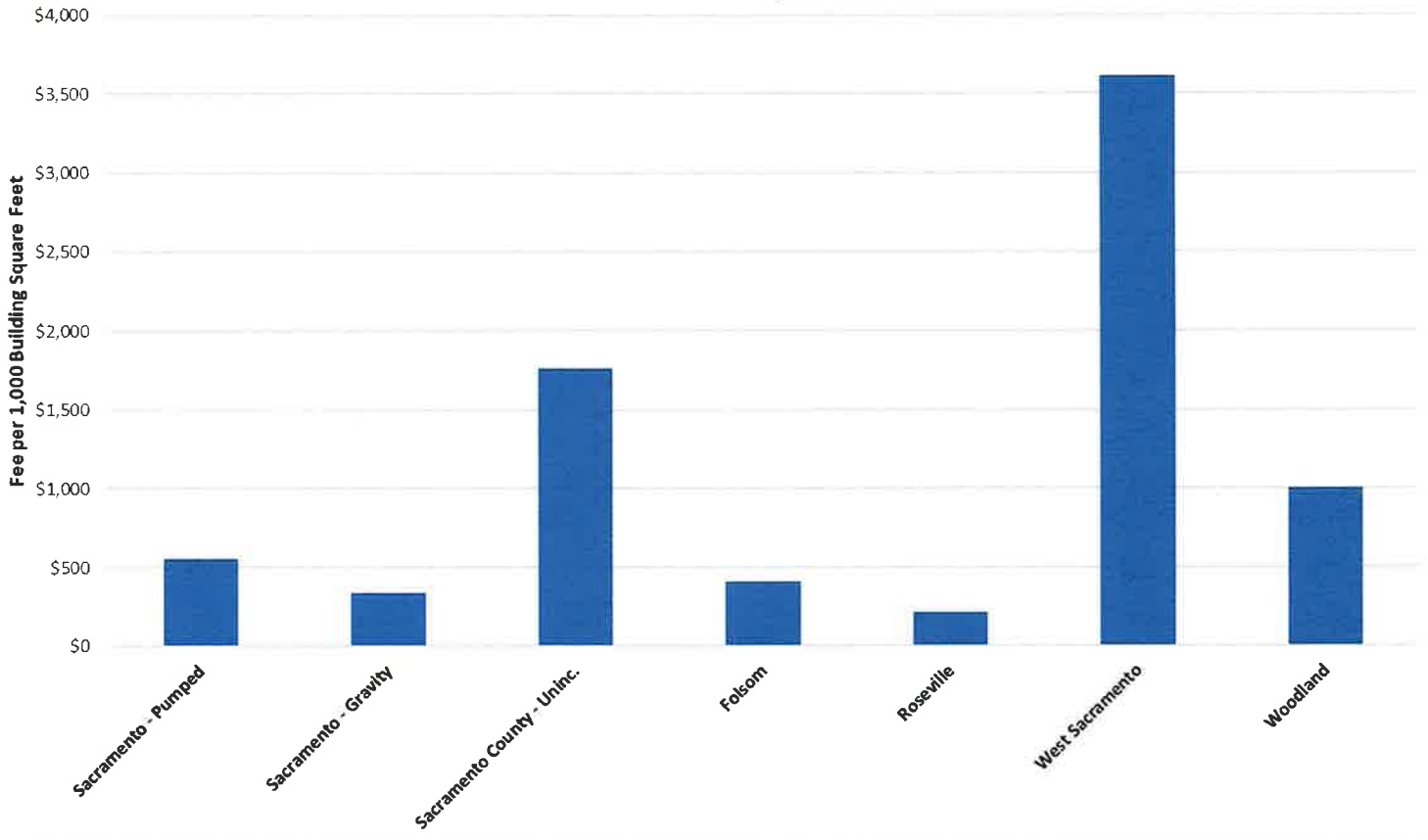


Chart E-2.4
Drainage Development Impact Fees per Acre
Single Family

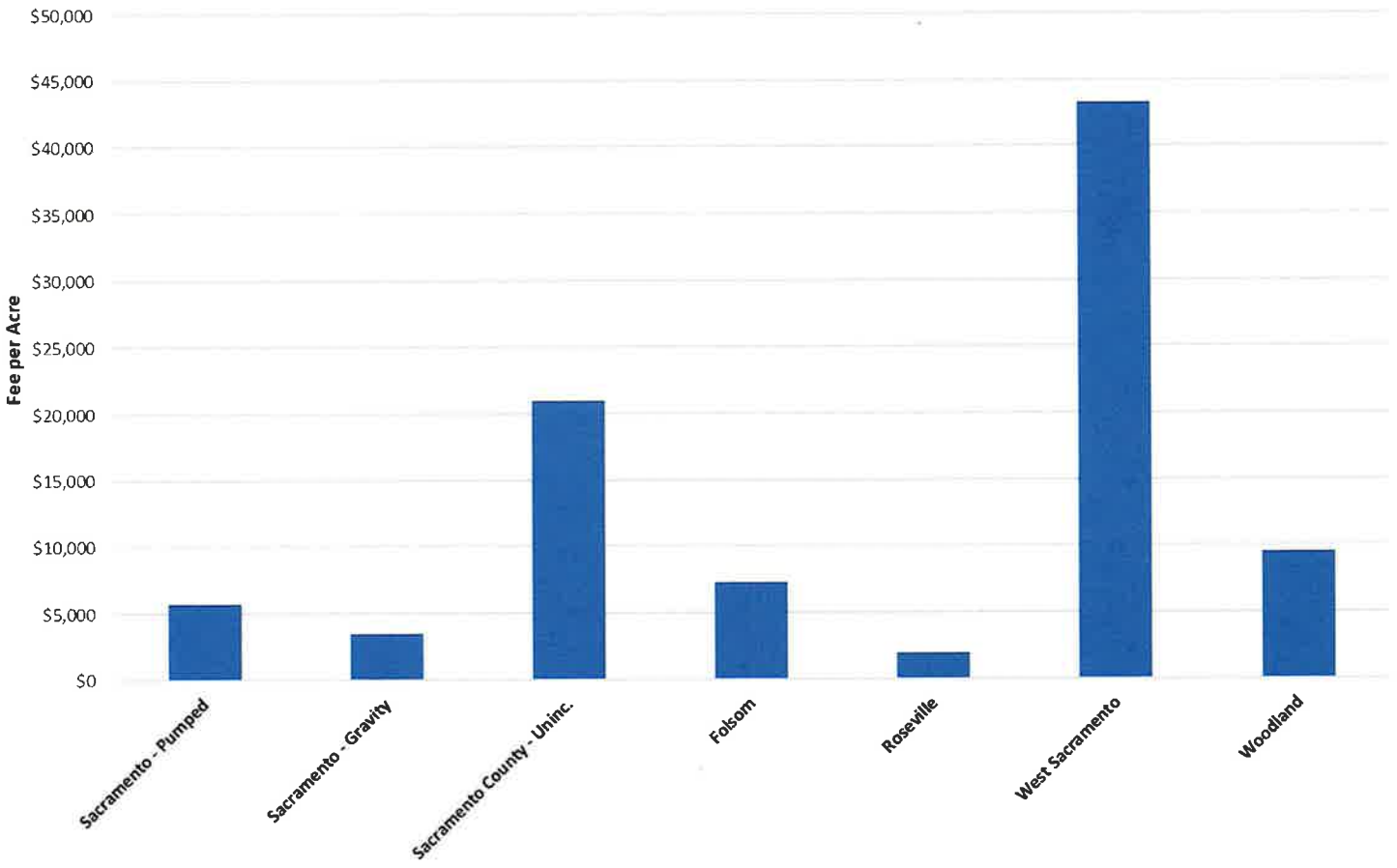


Chart E-2.5
Drainage Development Impact Fees per Acre
Retail

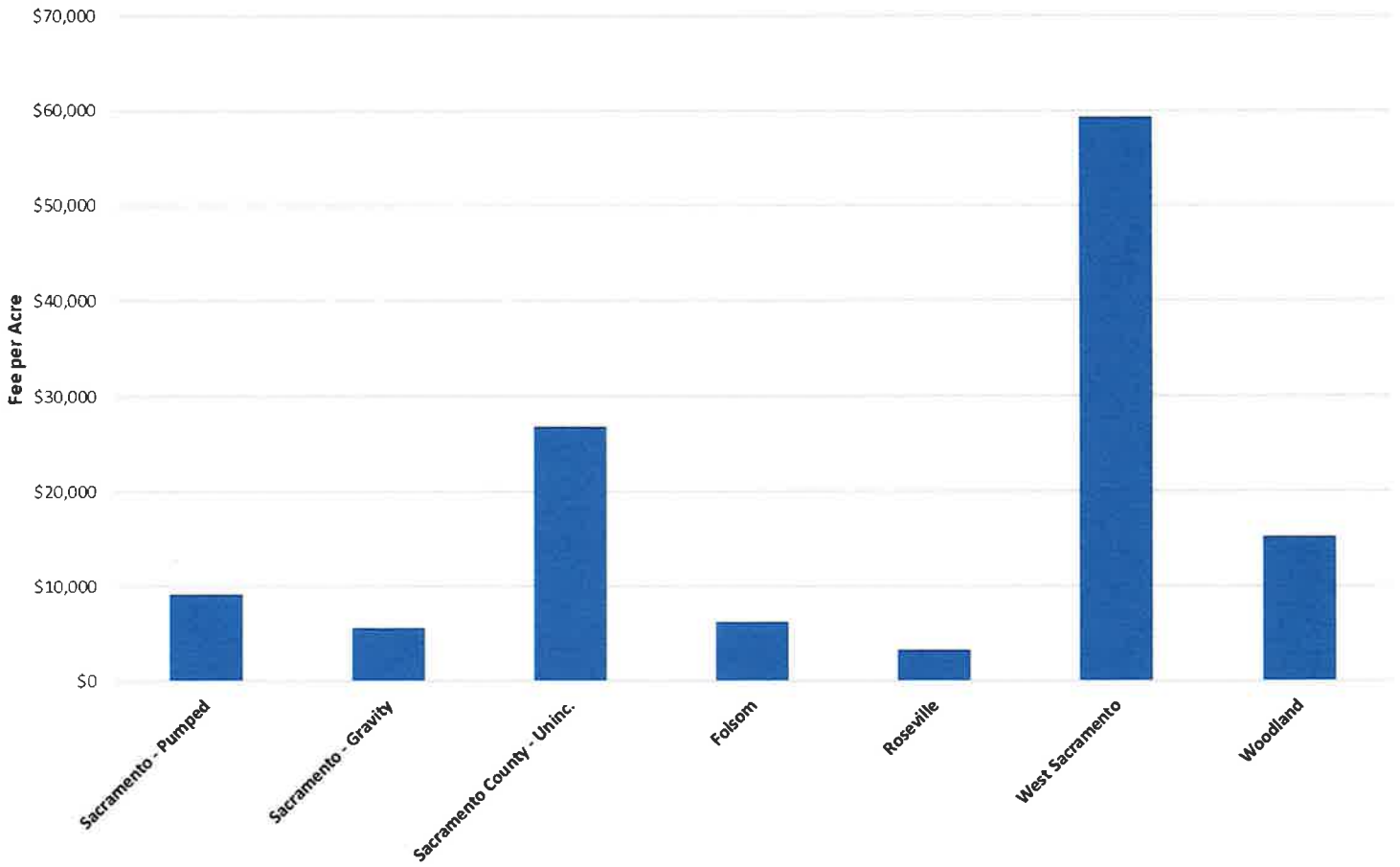
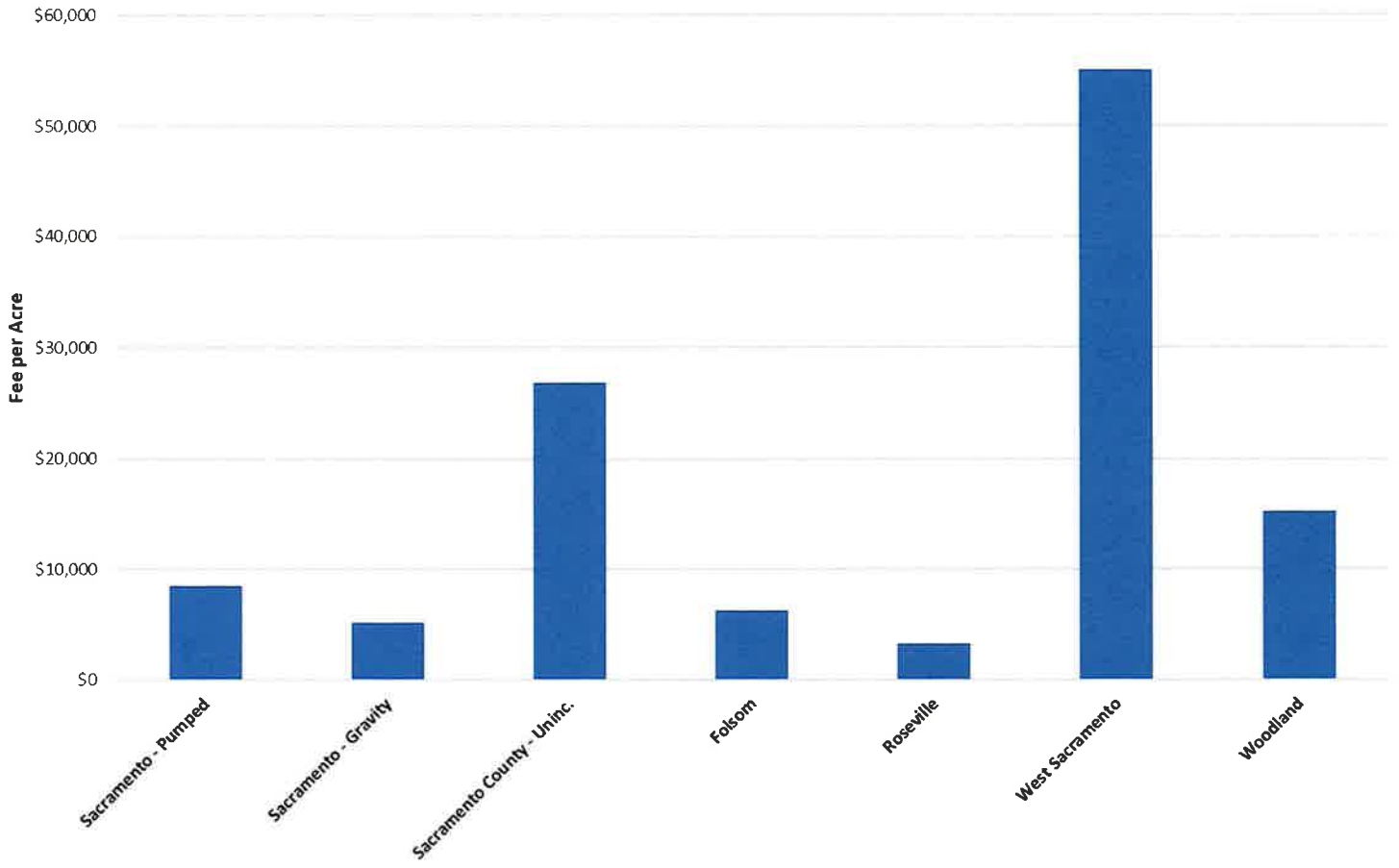


Chart E-2.6
Drainage Development Impact Fees per Acre
Office



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