Prop 84 Grant Study - Lower Stanislaus Low Impact Development Plan

Economic & Environmental Benefits of LID

Workshop

April 30, 2015
Riverbank, CA

AECOM

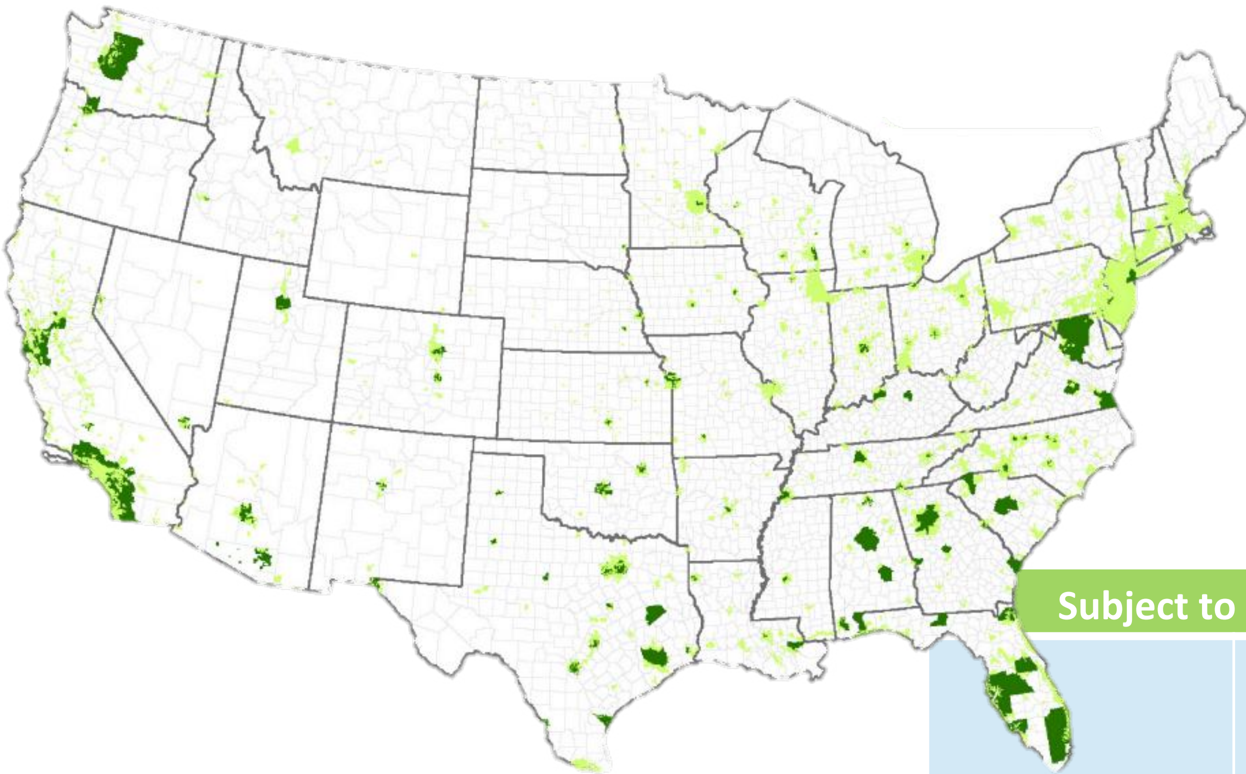
Lotus Water

Agenda

- Context
  - NPDES and Prop 84
- History of Prop 84 Grants in Riverbank
  - Low Impact Development Guidance Manual
  - Specific to the City of Riverbank
  - Site-scale process for implementation
- Alternative Compliance Study
  - Watershed characterization and analysis
  - Planning, design, and environmental assessment of centralized facilities
  - In lieu fee structures

CONTEXT

Regulated MS4s



Phase I: 858 MS4s
Phase II: 6,735 MS4s

Subject to Water Quality Based Regulations		
	Discharge to Impaired Waters	≥1 TMDL
Phase I MS4s	50%	53%
Phase II MS4s	64%	73%

EPA, 2014

LID in MS4 California Context

- *'in CA, urban storm water is listed as the primary source of impairment for ten percent of all rivers, ten percent of all lakes and reservoirs, and 17 percent of all estuaries'*
- -2010 Integrated Report

MS4– California

- 2003 – WQ Order No. 2003-0005-DWQ
  - Coverage to all small MS4s state-wide
  - Framed around six Minimum Control Measures
- 2013 – WQ Order No. 2013-0001-DWQ
  - Framed around water quality
  - Areas of Special Biological Significance (ASBS)
  - TMDL Implementation Requirements
  - New and Re-development (post-construction) **LID standards**
  - Increased monitoring/tracking to high priority water bodies
  - Specifies actions needed to reduce stormwater pollutants to MEP
  - Replaces SWMP with electronic NOI and Annual Report (SMARTS)

Writing GI into NPDES permits

- Establish performance standards for post-construction stormwater volume control for sites
- Require Green Infrastructure measures be considered and/or implemented as part of local building and site development approval process
- Establish ceilings on effective impervious area
- Incorporate water-quality based requirements in form of numeric effluent limits and/or specific control measures

Writing GI into NPDES permits – examples

- Santa Ana RWQCB, Orange County Permit
  - Requires priority development projects *infiltrate, harvest and reuse, evapotranspire or biotreat* the 85th percentile storm event
  - Design capture volume not managed by LID must be treated and discharged off-site (mitigation), or via in-lieu fees
- Los Angeles RWQCB, Ventura County Permit
  - Requires all new development and redevelopment projects to control pollutants and runoff volume through *infiltration, storage for reuse, evapotranspiration, or bioretention* by reducing effective impervious area to 5% of less of total project area

NPDES - Central Valley

- Phase I
  - East Contra Costa County
    - Antioch, Brentwood, Oakley
  - Sacramento County
    - Citrus Heights, Elk Grove, Folsom, Galt
  - City of Stockton / San Joaquin County
  - Port of Stockton
  - City of Modesto
  - Bakersfield Kern County
  - Fresno County
    - Fresno, Clovis, UCA Fresno
- Phase II
  - One General Permit covers all 86 cities in Central Valley

NPDES - Central Valley Future

- Stormwater Strategic Initiative
  - Regionalize approach through integration of Phase I and II
  - 2014 – SWRCB Stakeholder Meetings focused on:
    - Stormwater as a resource
    - Removal of pollutants by true source control
    - Increase programmatic efficiency and effectiveness

  …Through providing regulatory relief, standardizing permitting approaches, and facilitating funding
- March 2015 – Draft Release and Public Review
- April 2015 – Final Document

Proposition 84

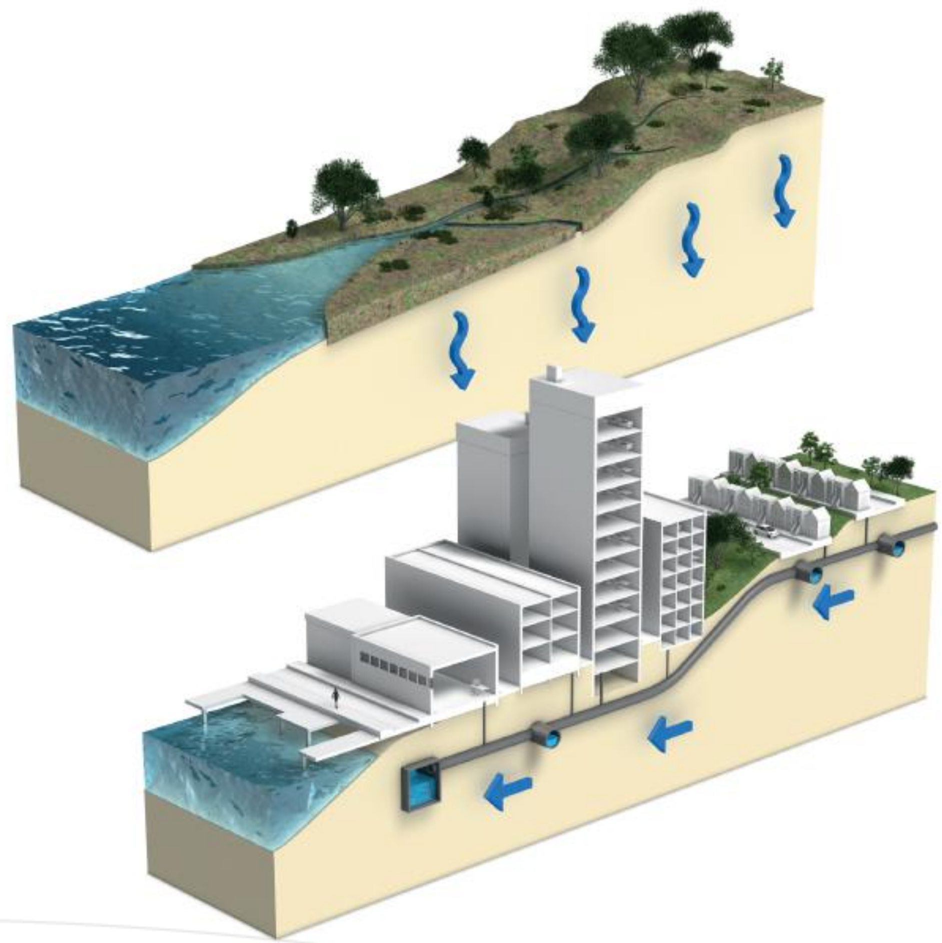
October 13, 2007 - Provide matching grants to local public agencies for the reduction and prevention of storm water contamination of rivers, lakes, and streams…..among other things

- Research
- Design & Construction
- Monitoring
- Technical Guidance
- Combination

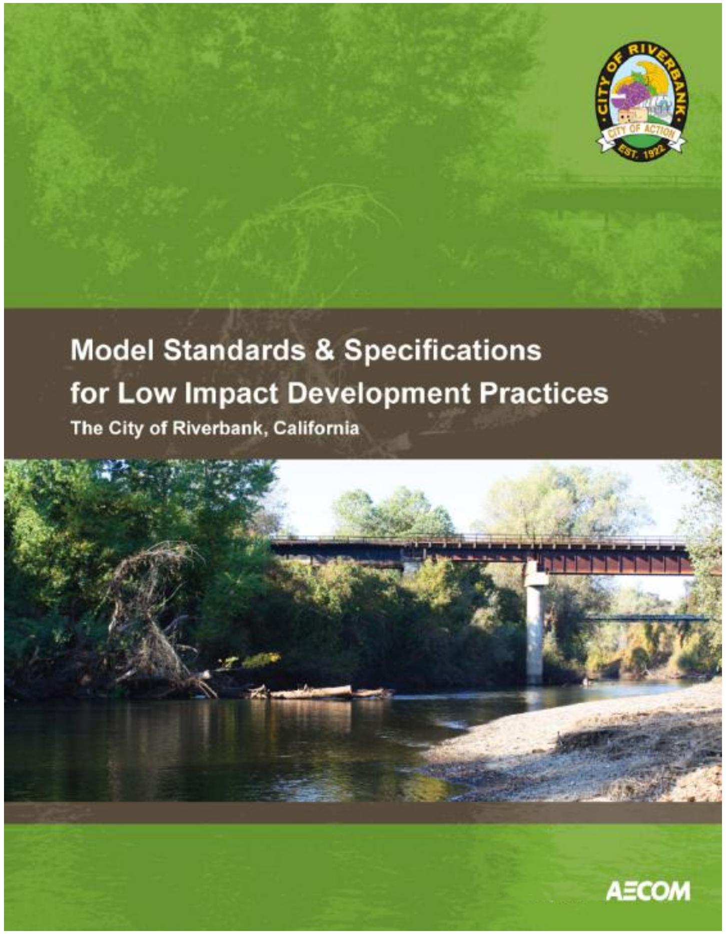
Why in Riverbank?

"The Stanislaus River is a wonderful community asset, the natural beauty and function of which we should protect as we increase public access to the River and its views."

- Community Development Director's Initiative
- Needed standards for local conditions
- Pipe and pump method not a long-term water quality solution
- Prop 84 Grant funding available
    - 2011 - LID Guidance Manual
    - 2012 - Alternative Compliance Study



LID GUIDANCE MANUAL



How to Use This Document

The following flow chart summarizes the steps to be taken when implementing LID practices for a project.

Step 1: Site Context — *Section 1*

- Map your site and its preliminary design considerations
- Review local regulatory conditions and applicability to your proposed development
- Understand LID goals, benefits, and challenges

↓

Step 2: Site Assessment — *Section 2*

- Analyze the your site to identify constraints and opportunities
  - Land Use/Existing Infrastructure
  - Hydrology
  - Groundwater
  - Topography
  - Soils and Geology
  - Space Constraints
- Identify appropriate Best Management Practices (BMPs) using BMP Selection Matrix

↓

Step 3: Detailed LID Design — *Section 3*

- Understand site opportunities, goals, and constraints
- Review BMP Fact Sheets
  - Underground Infiltration
  - Bioretention Area
  - Vegetated Swale
  - Filter Strip
  - Detention Pond
  - Constructed Wetland
  - Permeable Pavement
  - Rainwater Harvesting
  - Green Roof
- Implement and design BMPs

Site Assessment – Depth to Hardpan

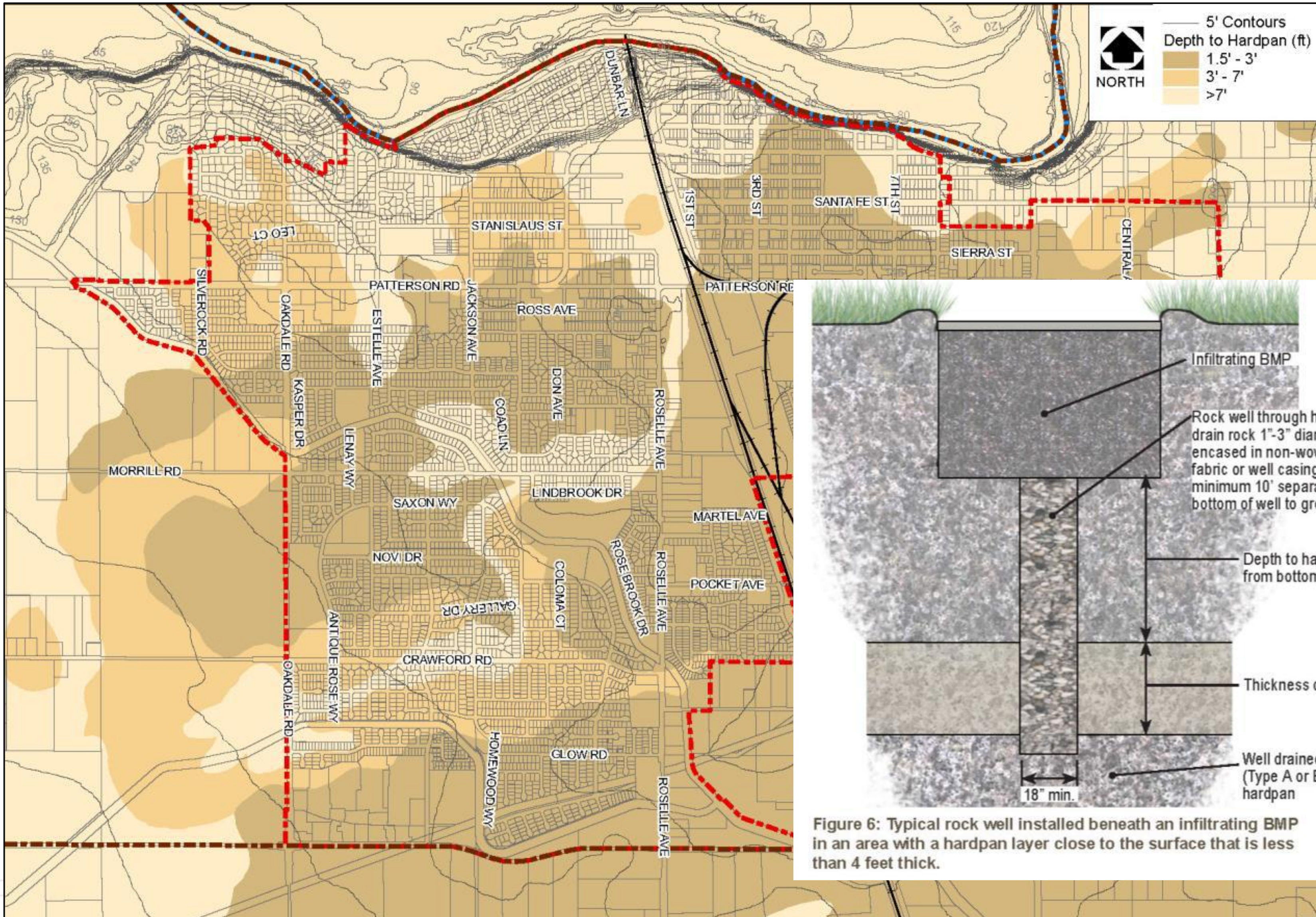


Figure 6: Typical rock well installed beneath an infiltrating BMP in an area with a hardpan layer close to the surface that is less than 4 feet thick.

Simplified BMP Selection Matrix

Constraint	Underground Infiltration	Bioretention Area	Vegetated Swale	Filter Strip	Vegetated Basin	Constructed Wetland	Permeable Pavement	Rainwater Harvesting	Green Roof
Located in floodplain?									
Less than 10-foot separation to groundwater table?		With liner and underdrain	With liner		With liner		With liner & underdrain (provides no treatment)		
Sited on steep slope (5-15%)?		If terraced	If installed along contour						
Sited on very steep slope (>15%)?									
Soil type C or D?		With underdrain					With underdrain (provides no treatment)		
Less than 10-foot separation to thin (<4') hardpan layer?	With rock well	With underdrain or rock well					With underdrain or rock well		
Less than 10-foot separation to thick (>4') hardpan layer?		With underdrain					With underdrain (provides no treatment)		
Limited space for BMP facilities?			With adequate length						

Figure 9: BMP Selection Matrix

3.0

Stormwater BMP Design

The use of LID techniques can aid in addressing the water quality and hydrologic issues that are typically exacerbated by development. When planning and designing new development and redevelopment the goals of LID and requirements of the MS4 Permit should be incorporated and promoted. These site design goals include:

- conserve natural areas and drainages;
- minimize impervious surfaces, drain to pervious area;
- minimize soil compaction;
- mitigate peak runoff and associated erosion; and
- treat runoff in stormwater BMPs.

There are a number of BMPs recommended for use in the City and surrounding areas. These facilities, along with sizing criteria and design recommendations, are detailed in this section.

BMP Sizing Criteria

Treatment control BMPs, which provide post-construction water quality benefits, are most efficient and economical when they target the frequent, small storm events that produce the majority of annual rainfall. Larger, more intense storms are the basis of design for conveyance and flood control facilities, but there are only marginal improvements to runoff water quality when BMPs are designed to this standard.

The NPDES permit specifies that BMPs for treatment of stormwater pollutants should be sized to either a flow-based or volume-based standard, or both. The permit lists three methods for volume-based sizing and two methods for flow-based sizing, summarized below.

Volume-based BMPs must be sized for:

- The volume of annual runoff based on unit basin storage water quality volume, to achieve 80% or more volume treatment by the method recommended in California Stormwater BMP Handbook (2003); or
- The 85th percentile 24-hour runoff event, from the formula recommended in Urban Runoff Quality Management, WEF Manual of Practice No. 23/ ASCE Manual of Practice No. 87, (1998); or
- The runoff volume produced from a historical-record based reference 24-hour rainfall criterion for "treatment" that achieves similar pollutant reduction to the 85th percentile 24-hour runoff event.

Flow-based BMPs must be sized for:

- The flow produced from a rain event equal to at least twice the 85th percentile hourly rainfall intensity; or
- The flow that will result in treatment of the same portion of runoff as treated using volume-sizing.

Methods for sizing flow and volume-based BMPs are explained on the following page.

Larger or more complicated projects may benefit from the use of continuous simulation modelling in lieu of these simplified methods; there are numerous software package available which provide this functionality.

Flow-Based Sizing

Flow-based BMPs must be designed to carry or process the runoff resulting from the targeted water quality rainfall under flow conditions that promote treatment (specific to each BMP, but generally low velocity and minimal flow depth). The water quality flow (WQF) is the flow of runoff produced by a rain event equal to twice the 85th percentile hourly rainfall intensity, based on local rainfall data. For the Riverbank area, the 85th percentile hourly rainfall intensity is approximately 0.10 inches per hour[1], resulting in a design rainfall intensity of **0.20 in/hr**.

To calculate the required treatment flow, first determine the size of the drainage area contributing runoff to the BMP and the composite stormwater runoff coefficient[2] for that drainage area. The rational method can then be used to calculate the flow rate:

WQF = C x i x A = 0.20 x C x A

Where:

- WQF = water quality flow (cfs)
- C = composite runoff coefficient for drainage area (unitless)
- i = design rainfall intensity (0.20 in/hr)
- A = drainage area (acres)

1 Based on California State University, Sacramento Office of Water Programs' Basin Sizer, Version 1.46 (2007).

2 Standard runoff coefficients for different land use types can be found in Section 4.3 of the City of Riverbank Storm Drain System Master Plan (2008).

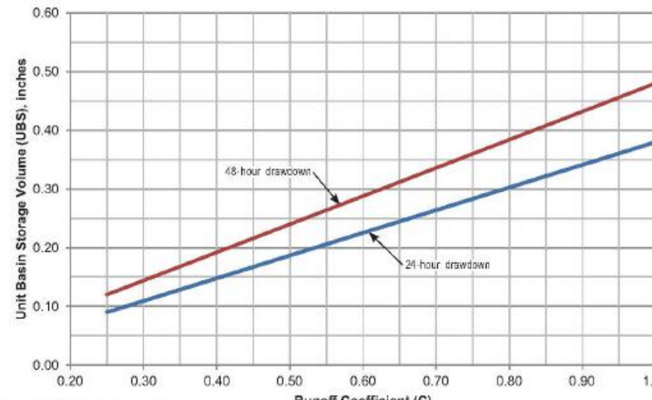


Figure 10: Unit Basin Storage Curves

Volume-Based Sizing

Volume-based BMPs must be designed to capture and treat 80 percent or more of the annual runoff volume, determined using the methodology recommended in the California Stormwater BMP Handbook. The water quality volume (WQV) to which a BMP must be sized is based on the drainage area's unit basin storage volume, determined from local rainfall data and site characteristics. A volume-based BMP must also be designed to release this volume (typically through an orifice or via infiltration) within an acceptable drawdown time (generally 24-48 hours).

To calculate the required treatment capture volume, first determine the size of the drainage area contributing runoff to the BMP and the composite stormwater runoff coefficient for that drainage area. The Unit Basin Storage Volume (UBS) for the drainage area is determined from the sizing curve for 80% capture; find the composite runoff coefficient of the drainage area on the x-axis, follow it up until it intersects the line representing the desired drawdown time, and read the corresponding UBS value from the y-axis. Calculate the treatment volume by multiplying the UBS by the drainage area (convert to more convenient units, such as cubic feet or gallons, for use during design):

WQV = UBS x A

Where:

- WQV = water quality volume
- UBS = Unit Basin Storage Volume (inches)
- A = drainage area (acres)

BIORETENTION AREA

Other Names: Raingarden, Bioretention Cell, Bioretention Swale, Dry Swale, Flow-Through Planter

Bioretention areas are shallow, landscaped areas that receive and treat stormwater. Runoff is allowed to pond on the surface of the bioretention area, typically less than a foot deep, where it can then filter through a vegetative layer and engineered soil media to remove sediment and pollutants. In locations of well drained subsoils, the water may then infiltrate into the subgrade. At sites or locations that will not allow for infiltration, flow-through systems are required; underdrains are installed beneath the planting soil to drain the facility and release the treated water to a conveyance feature or storm drain system. Bioretention areas are very versatile facilities that can fit a wide range of settings.

Bioretention areas are among the most common LID techniques implemented, often in highly visible locations, and can be a valuable educational opportunity especially if signage is installed illustrating function, intent, or native plants.

Retrofit Opportunities

Benefits

- Applicable to a wide range of sites and layout, easily integrated into urban retrofit projects
- Provides reliable water quality function and facilitates evapotranspiration
- Attenuates peak flows; reduces runoff volume and recharges groundwater when infiltration possible
- Provides greening and reduces heat island effect in urban areas
- Provides aesthetic amenity and creates habitat

Potential Constraints

- Infiltration design requires sufficiently permeable soils, depth to groundwater/hardpan; underdrain system increases cost and infrastructure
- Vegetation requires maintenance
- Maintaining desired aesthetics may require dry season irrigation
- Should not receive more than about 1 acre of runoff; divide larger watersheds among dispersed cells

Siting Applications

- Residential yards
- Office and commercial storefronts
- Roadway medians, bulb-outs, and traffic circles
- Parking lot islands, cul-de-sacs
- Parks and other landscaped areas

Technical Information

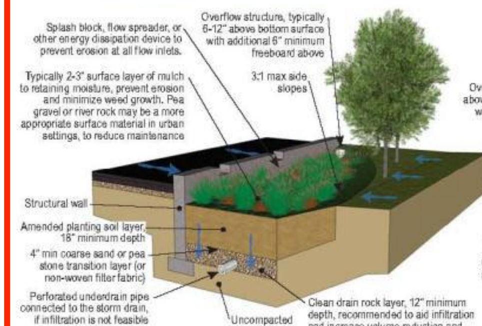


Figure: Bioretention area detail, showing hard edge and soft edge

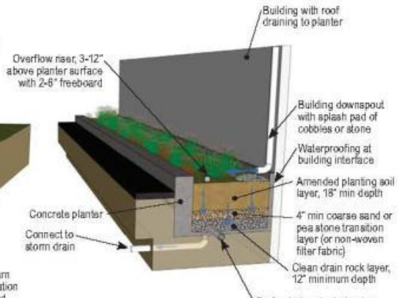


Figure: Bioretention flow-through planter typical detail

Design & Sizing Criteria

- Bioretention areas can be sized as either volume-based or flow-based systems (or a combination).
- Volume-based systems are sized to capture the WQV within the surface ponding area and void space of the drain rock storage layer and should release all captured runoff within a maximum 48 hour drawdown time (either by subgrade infiltration or through an underdrain).
- Flow-based systems are sized to percolate the WQF through the bottom of the facility. The surface area of the system multiplied by the infiltration rate of the planting media (which should be considered as 5 in/hr for design) must equal or exceed the WQF. The subgrade infiltration rate must be high enough to process this flow as well, or an underdrain is necessary.
- Reliance on subgrade infiltration requires a minimum soil infiltration rate of 0.5 in/hr, in addition to the above requirements. Within impermeable soils (Type C and D), an underdrain should be installed.
- If the separation from the bottom of the facility to the seasonally high groundwater elevation is less than 10 feet then an underdrain should be installed, with an impermeable liner placed beneath all system media.
- Infiltrating bioretention systems should be placed a minimum of 10 feet from building foundations and 100 feet from drinking water wells.
- Pretreatment (vegetated buffer strip, swale, sediment forebay) can improve function and ease maintenance.
- Runoff from storms larger than the water quality event are ideally diverted to the storm drain system.

Plant Selection *(See Appendix A)*

Plants should be suitable for periods of inundation during the rainy season. Vegetation should be drought-tolerant, especially at the edges, but may require irrigation during initial establishment or dry periods. Trees require more intensive maintenance, and may show limited growth.

Blue eyed grass

Desert baccharis

California rose

San Diego sedge

Appendix A - Plant List

The species listed below are intended to serve as a general guide for identifying plants likely to be suitable for use in LID within Central California climate zones. This list has been compiled of largely California native species and augmented with California friendly species to promote species diversity while avoiding monoculture. The list has been organized to group species likely to be compatible with the hydrozones found in the LID solutions in this manual and includes information for determining estimated water budgets. A qualified professional in LID site design should be consulted before construction and implementation.

Photo	Common Name	Latin Name	Form	Light Level	Irrigation Need	Height/ Spread
Suitable for short periods of inundation (24-48 hours)						
	Blue eyed grass	*Sisyrichium bellum*	Grass	Sunny	Very Low	6”-18”
	Blue Oat Grass	*Helicotrichon sempervirens*	Grass	Sunny	Medium	24”-30” / 24”-30”
	California rose	*Rosa californica*	Shrub	Sunny	Low	3’-5’ / 8’-10’
	California wax myrtle	*Myrica californica*	Shrub	Sunny	Low	15’-20’ / 15’-20’

Photo	Common Name	Latin Name	Form	Light Level	Irrigation Need	Height/ Spread
	Silvery Sedge	*Carex canescens*	Grass	Sunny	High	1’-2’ / 1’-2’
	Soft Rush	*Juncus effuses*	Grass	Sunny	Medium	2’-3’ / 2’-3’
	Sweet bay	*Laurus nobilis*	shrub	Partial Shade	Low	15’-20’ / 15’-20’
	Western meadow sedge	*Carex praegracilis*	Grass	Sunny	Medium	12”-15”
	Western sycamore	*Platanus racemosa*	Tree	Sunny	Medium	40’-80’ / 30’-50’

Notes: Certain plants which prefer very wet environments will generally be suitable for use in locations which experience only short periods of inundation. Of the plants listed above, this would include Cardinal Flower, Pacific Reed Grass, and Scarlet Monkey Flower.

ALTERNATIVE COMPLIANCE STUDY

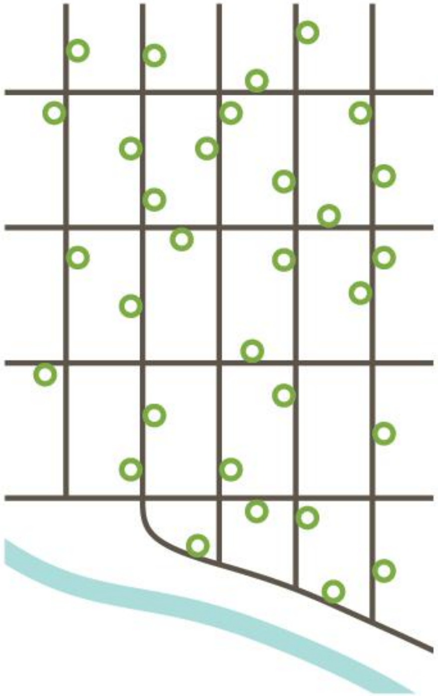
Study Overview

- ## Study Goals & Objectives:
  - Provide City of Riverbank & Development Community with **options**
    - Align with City of Riverbank General Plan Goals
    - Comply with State permits
  - Devise an **alternative compliance** strategy for Phase II MS4s
  - Design and cost regional LID features to **provide data** for long-term financial planning of appropriate in-lieu fee structures

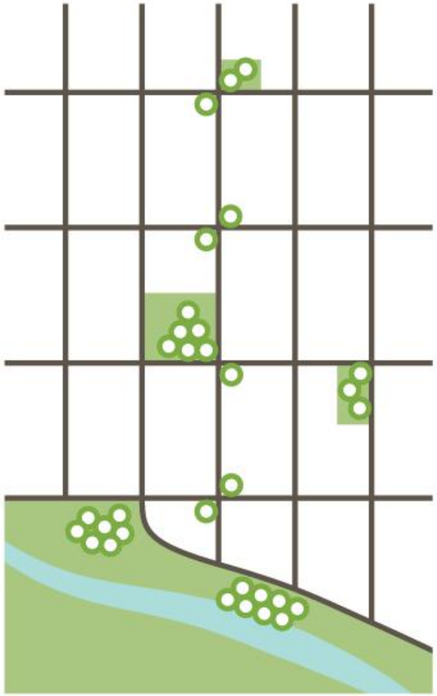
- ## Project Goals:
  - Protect and improve water quality in the Stanislaus River
  - Promote groundwater recharge
  - Achieve broader community goals and benefits

Alternative Compliance: Objectives

- Mitigate stormwater impacts of multiple projects in semi-centralized manner
- Regional-scaled features (priority investment areas)
- Opportunity for increased environmental and public benefits



Compliance
Business as Usual



Alternative Compliance
Public Benefit

Benefits of Alternative Compliance

- Flexibility of location and timing
- Greater control for meeting watershed-level needs
- Community input
- Better use of existing continuous hydrologic simulation modeling
- Ensured maintenance

Challenges of Alternative Compliance

- Municipalities have large role in planning and maintaining facilities
- Potential distrust with applicants and the community if AC programs are unclear or perceived as inconsistent
- Difficult to quantify and compare success at different locations
- Hard to set fair equivalencies
- Potential for under-funding of capital costs and O&M for off-site facilities
- Mismatched timing of development project and off-site mitigations

CASE STUDIES & BEST PRACTICES

Municipalities / Case Studies Reviewed

- California
  - City of Watsonville (Santa Cruz County)
  - Lake Tahoe (Placer and El Dorado counties)
  - **Los Angeles County**
  - San Diego County
  - **Ventura County**
- Maryland
  - **Prince George's County**
- Virginia
  - Frederick County
  - Henrico County
- West Virginia
  - **Department of the Environment**
- Washington, DC

BOLD = Most applicable and interesting to Riverbank

Alternative Compliance: Recommended Protocol

1. Include conservative design / cost estimates to ensure sufficient in-lieu fee (design, construction, and maintenance); focus on known costs

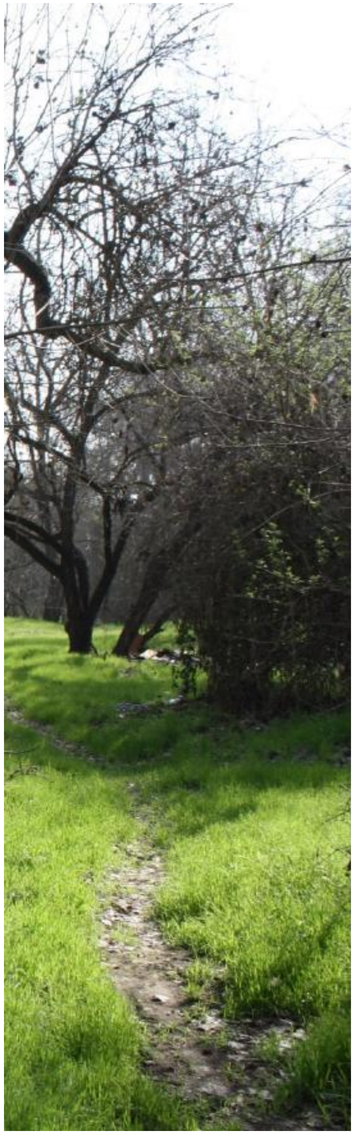
2. Build safeguards that reduce environmental and socioeconomic risks (trading ratios >1:1)

5. Establish clear criteria and zones within urban areas for AC development.

6. Develop appropriate metrics to evaluate mitigation success (runoff volume, impervious surface area, stream restoration)

7. Understand cost data for different AC scenarios (new development, redevelopment, physical conditions)

8. Identify and account for unmitigated runoff at the site and watershed scale



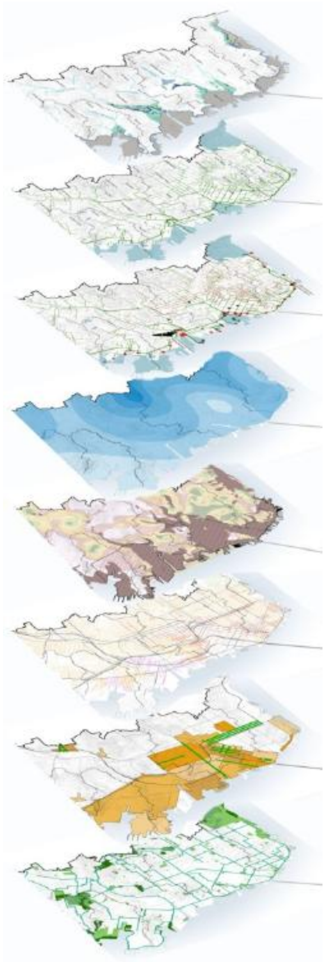
THE PROCESS

Process for Alternative Compliance Study

1. **Watershed Characterization**
   - Sub-watershed delineation
   - Existing conditions
   - Prioritization
2. **Watershed Opportunities**
   - Stormwater control measures
   - Sub-watershed opportunity locations
3. **Project Development**
   - Conceptual design
   - Order-of-magnitude cost estimates
4. **In-Lieu Fee Structure**

Characterization Process

- Delineate sub-watersheds and their connectivity
- Analyze existing conditions data
- Identify needs and challenges (quality and quantity)
- Prioritize sub-watersheds according to needs and development potential
- Delineate Focus Areas of study



Opportunity Locations Selection Process

Initial Screening → Feasibility Analysis → Project Sites

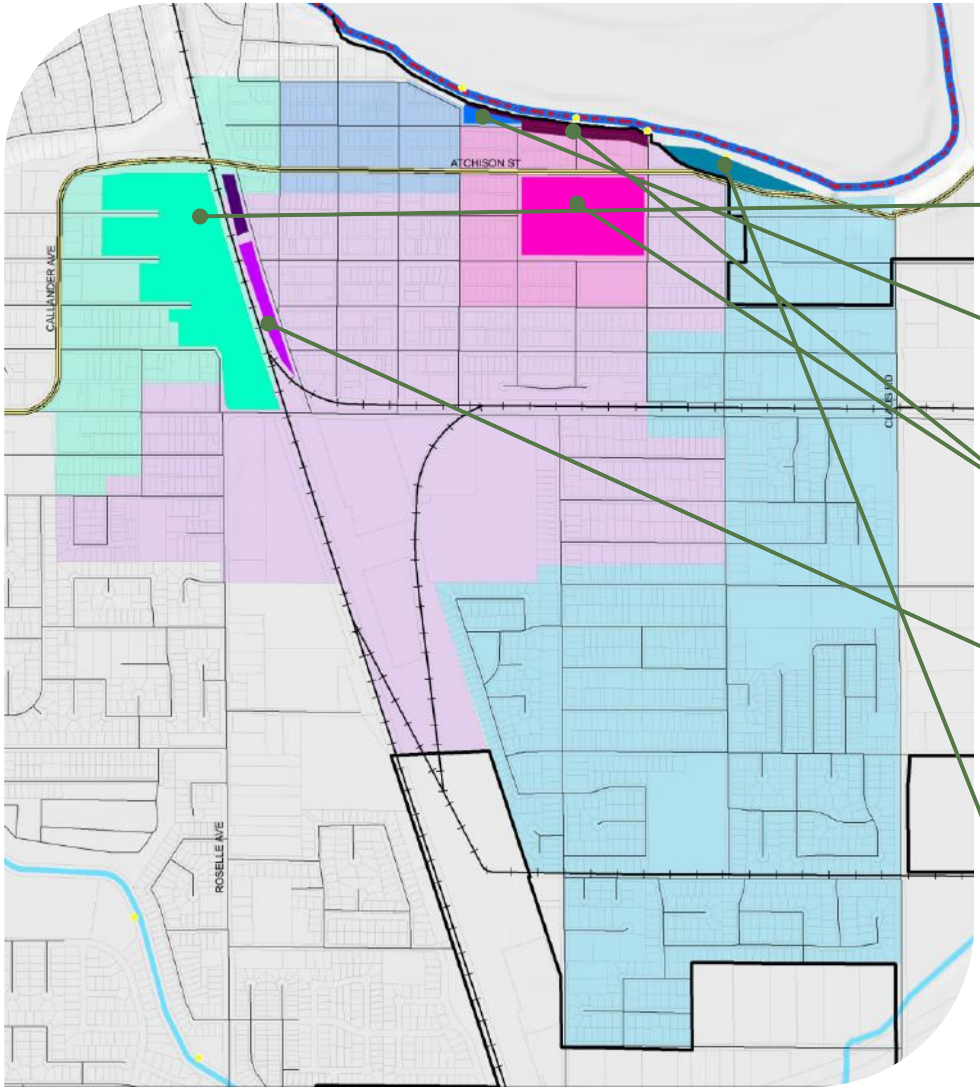
Assessment Criteria

- Position within watershed
  - Capture potential
  - Proximity to river
- Land Use, Zoning & Ownership
- Existing/Proposed Infrastructure
- Physical Characteristics
  - Available space
  - Soils, groundwater, slope

Site Challenges

- Regulatory Issues
- Property Acquisition
- Operations and Maintenance
- Existing Land Use
  - Zoning
  - Limited space
- Future Land Use
  - Zoning
  - Lost Opportunities

Conceptual Project Sites



6 Projects

- **Cannery Sub-watershed**
  - 1 project
- **4th Street Sub-watershed**
  - 1 project
- **6th Street Sub-watershed**
  - 2 projects
- **7th Street Sub-watershed**
  - 1 project *(for portion of sub-watershed going to 1st Street Basin only)*
- **8th Street Sub-watershed**
  - 1 project

PROJECT CONCEPTS

Conceptual Project Locations

Design Process

Step 1
- Existing Conditions Site Assessment

Step 2
- Assess and Define Drainage Management Area

Step 3
- Determine Water Quality Volume

Step 4
- Select and Design LID Technology

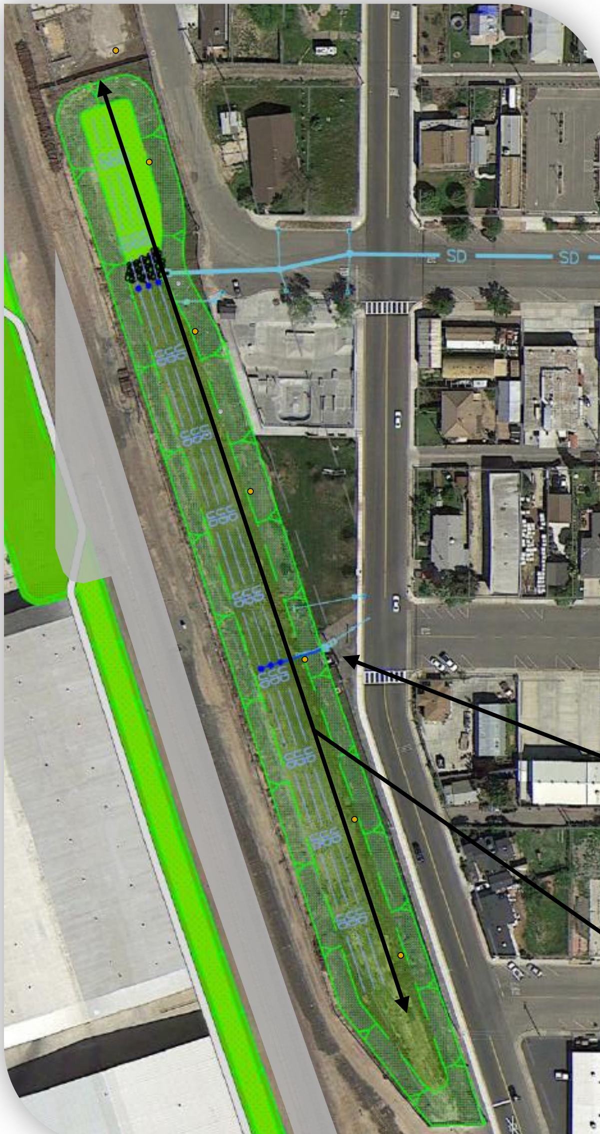
Step 5
- Assess Water Quality Benefits

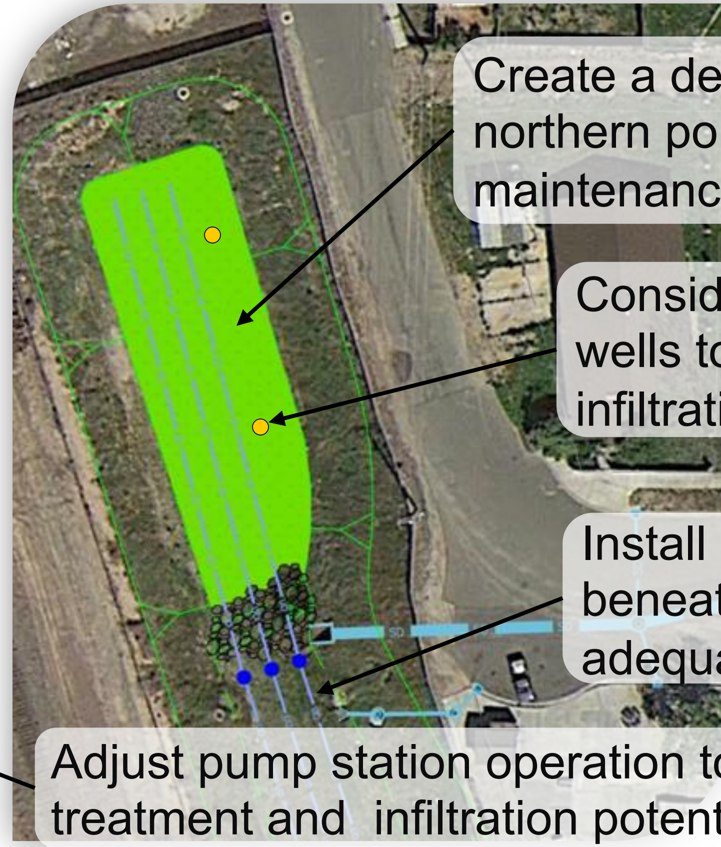
Project: 1st Street Basin Treatment Improvements

- **Sub-watershed Area:** 258 acres
- **Area Managed**: 194 acres
  - Treatment Volume: 6.19 ac-ft
- **Project Footprint:** 1.4 acres
- Supplements improvements proposed per 2008 Storm Drain Master Plan and First Street Basin Improvements TM

1st Street Basin Treatment Improvements

1st Street Basin Treatment Improvements





Create a deepened forebay in northern portion to improve maintenance and lifespan

Consider installing dry wells to increase infiltration capacity

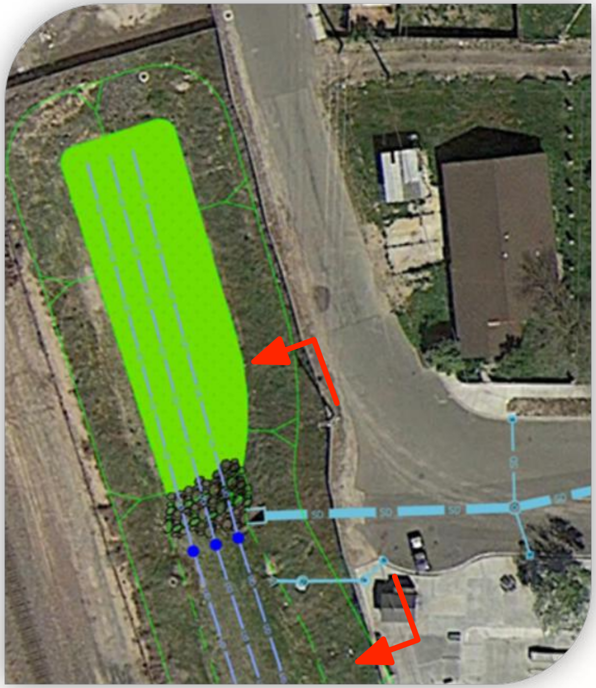
Install underdrain system beneath soil to ensure adequate drawdown time

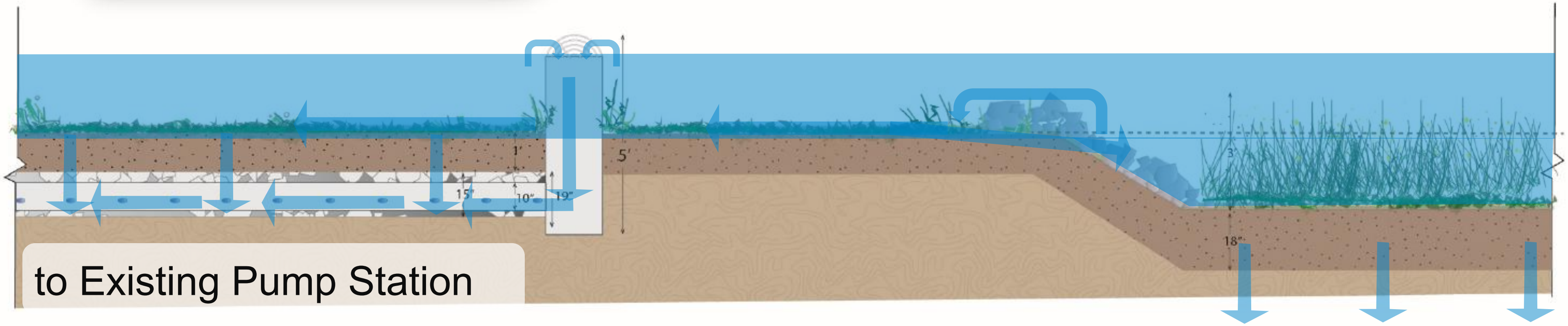
Adjust pump station operation to maximize treatment and infiltration potential

Install amended soil across entire bottom of basin to act as filtration media

Upgrade existing basin to enhance treatment potential.

1st Street Basin Treatment Improvements



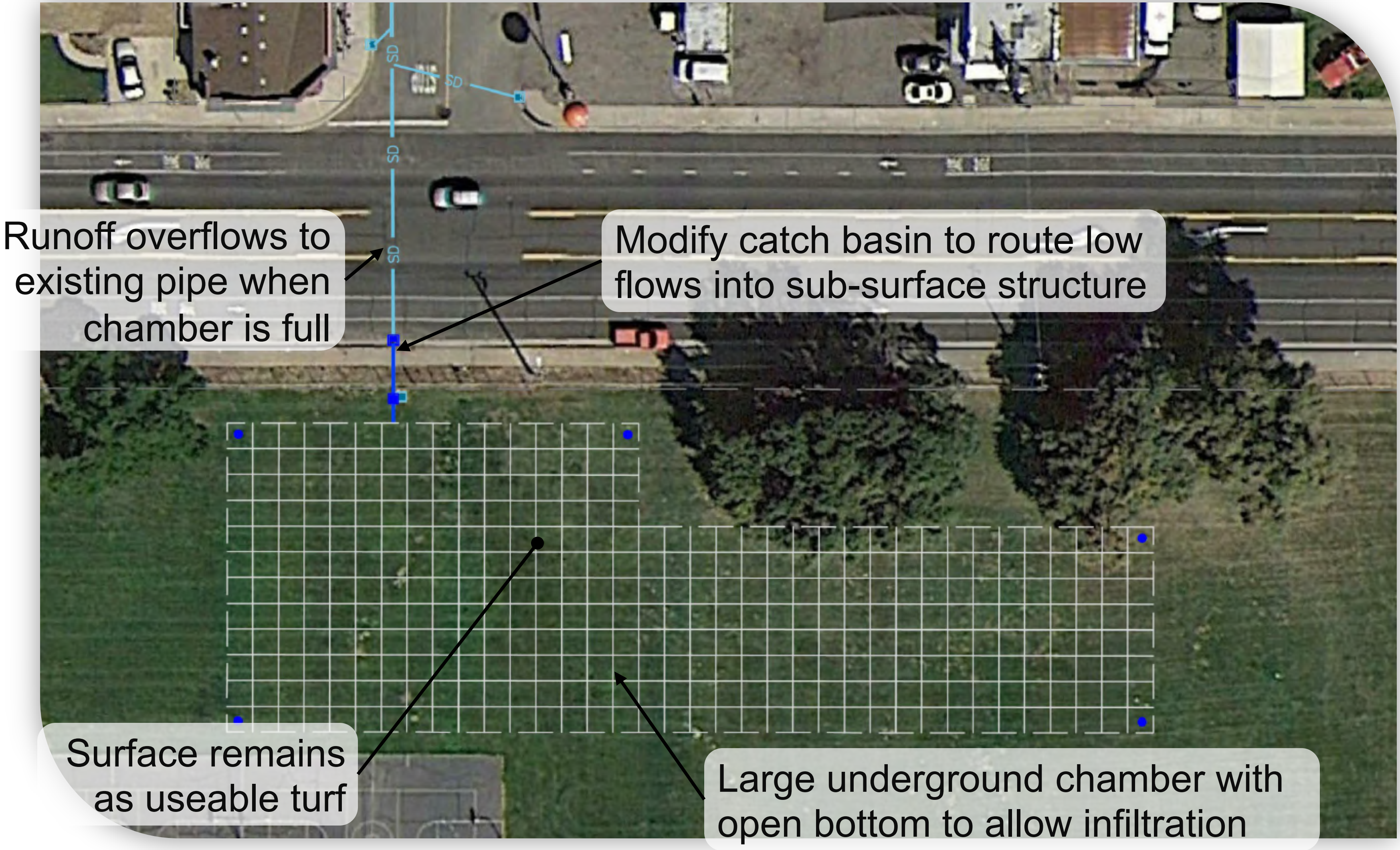


Project: Cardozo School Infiltration Gallery

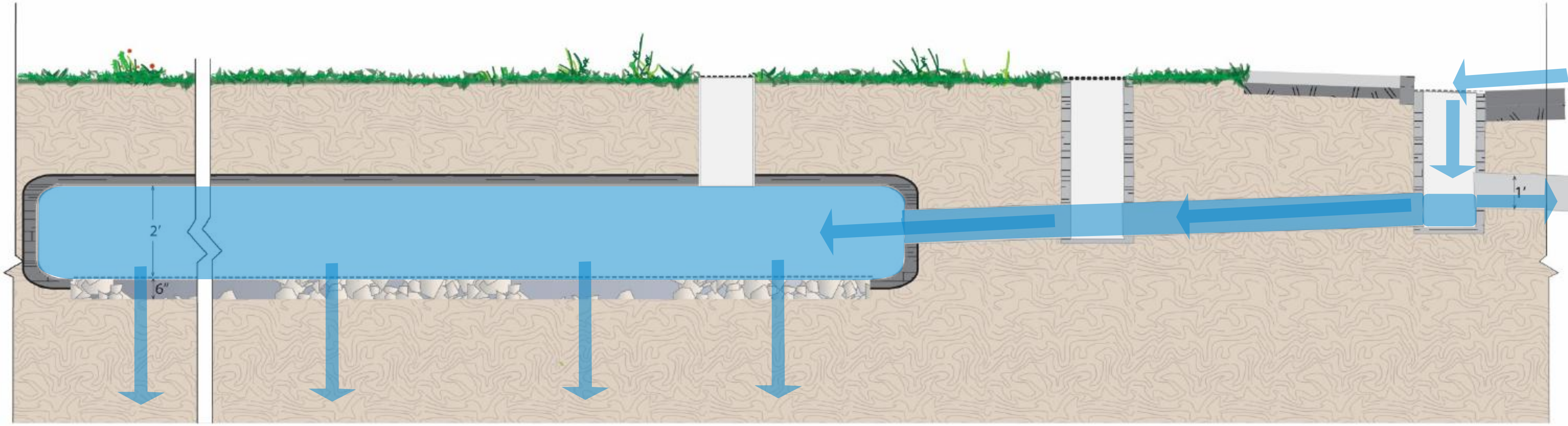
- **Sub-watershed Area:** 47 acres
- **Area Managed by Project**: 36 acres
    - Treatment Volume: 1.01 ac-ft
- **Project Footprint:** 0.5 acres

Cardozo School Infiltration Gallery

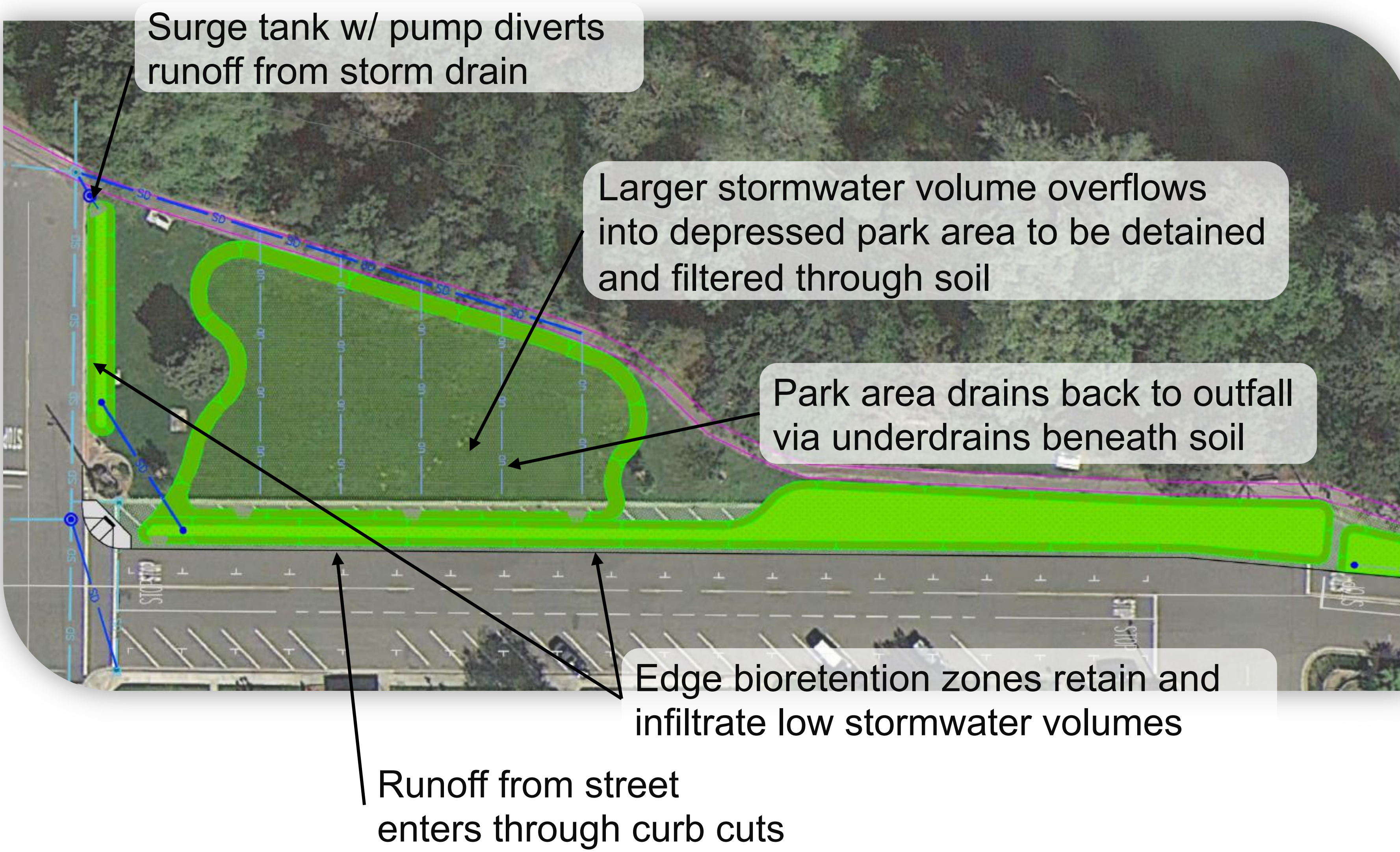
Cardozo School Infiltration Gallery



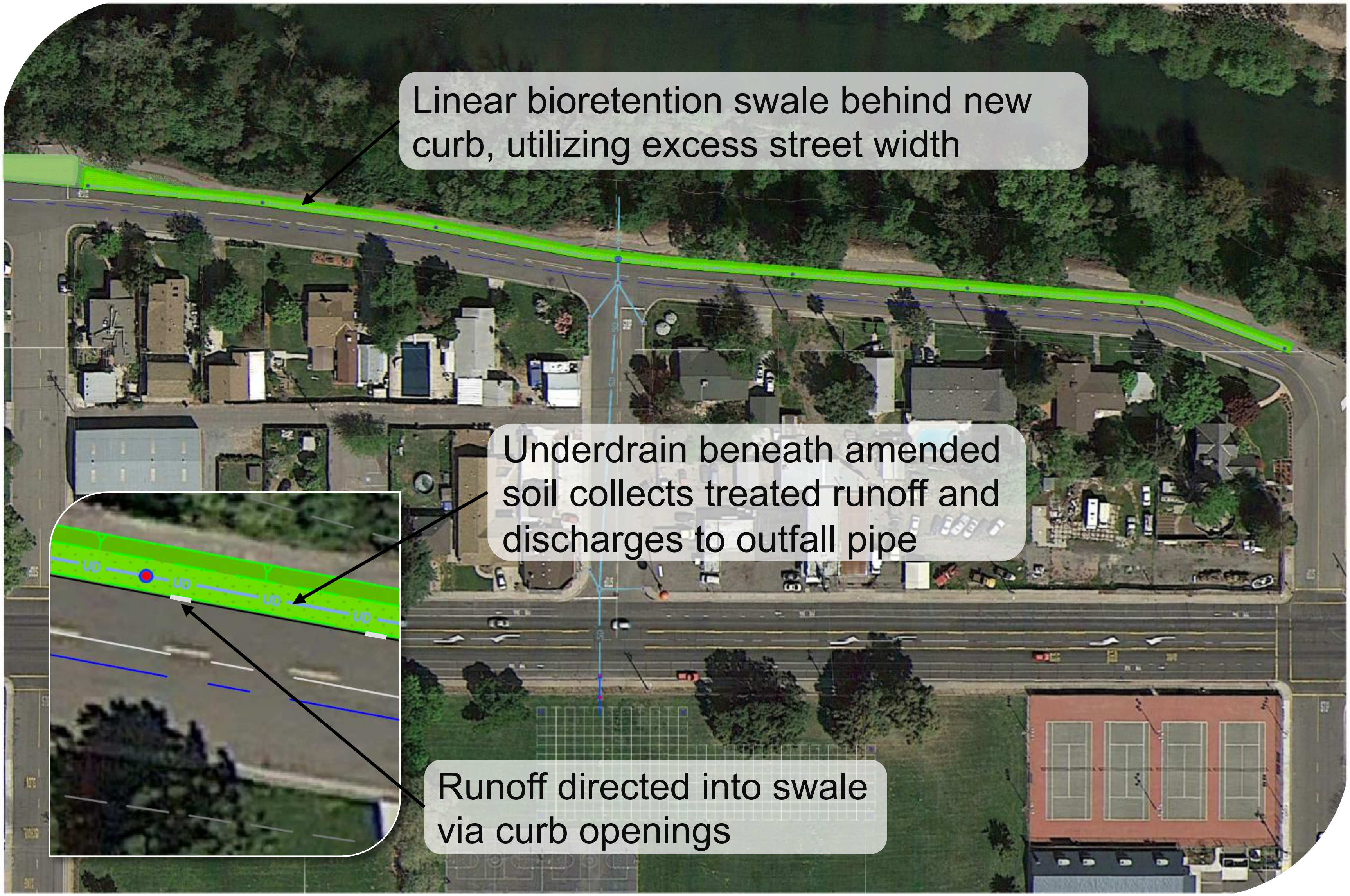
Cardozo School Infiltration Gallery



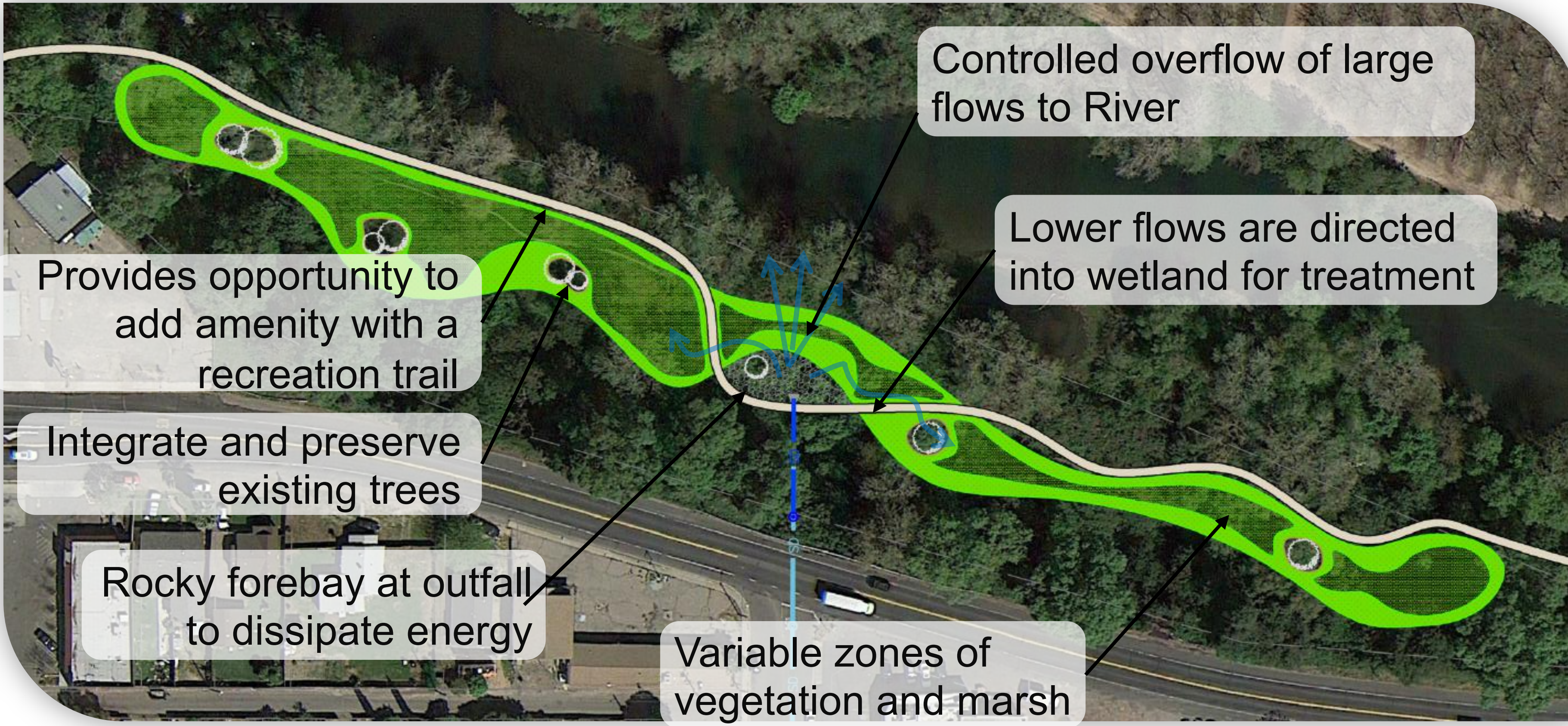
Hutcheson Park Bioretention



Riverside Drive Green Street



Open Space Treatment Marsh



Cannery Site Vegetated Buffer

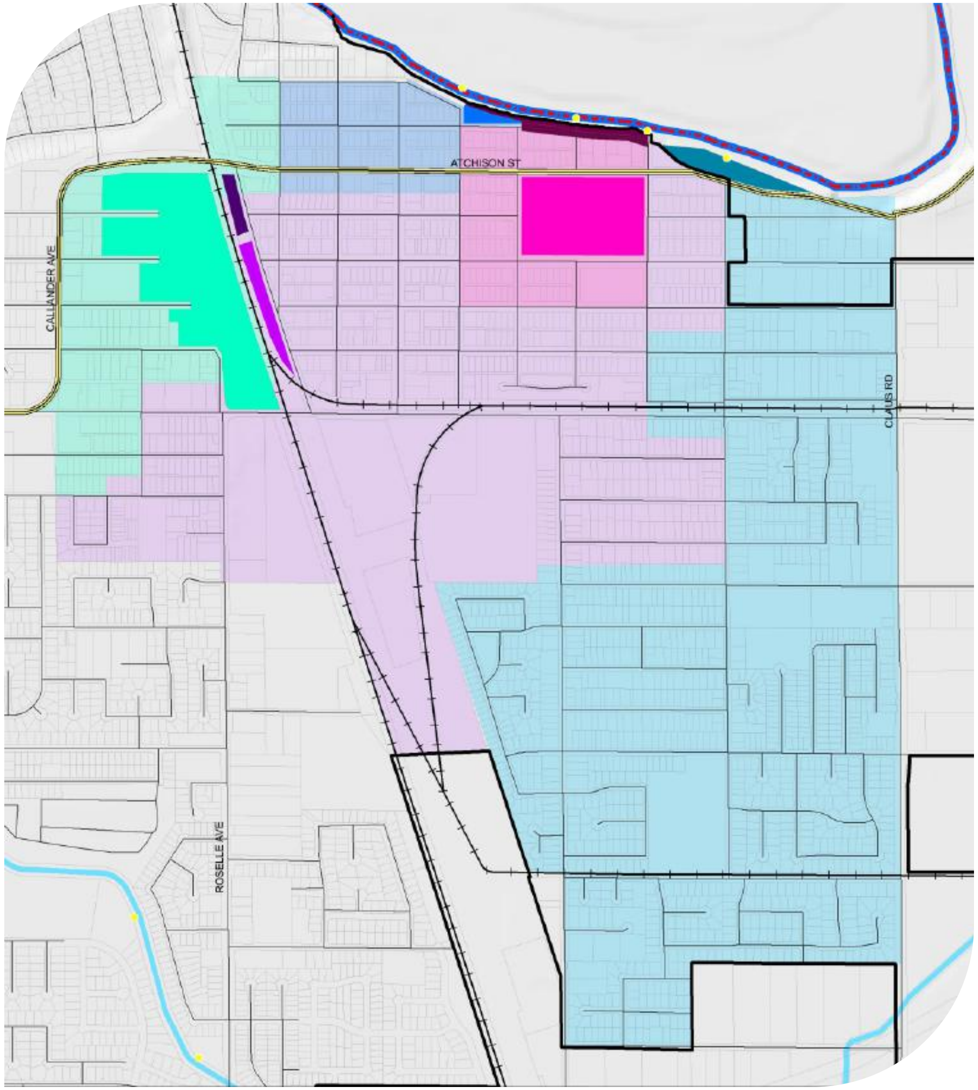
Connect to off-site storm drain or First Street Basin

Diversify landscaping with multi-use grassy areas

Provides opportunity to integrate with a pedestrian/bicycle trail

Linear “bioretention” vegetated buffer (swales/basins) provides treatment, aesthetic amenity, and noise buffer from railroad and SR108

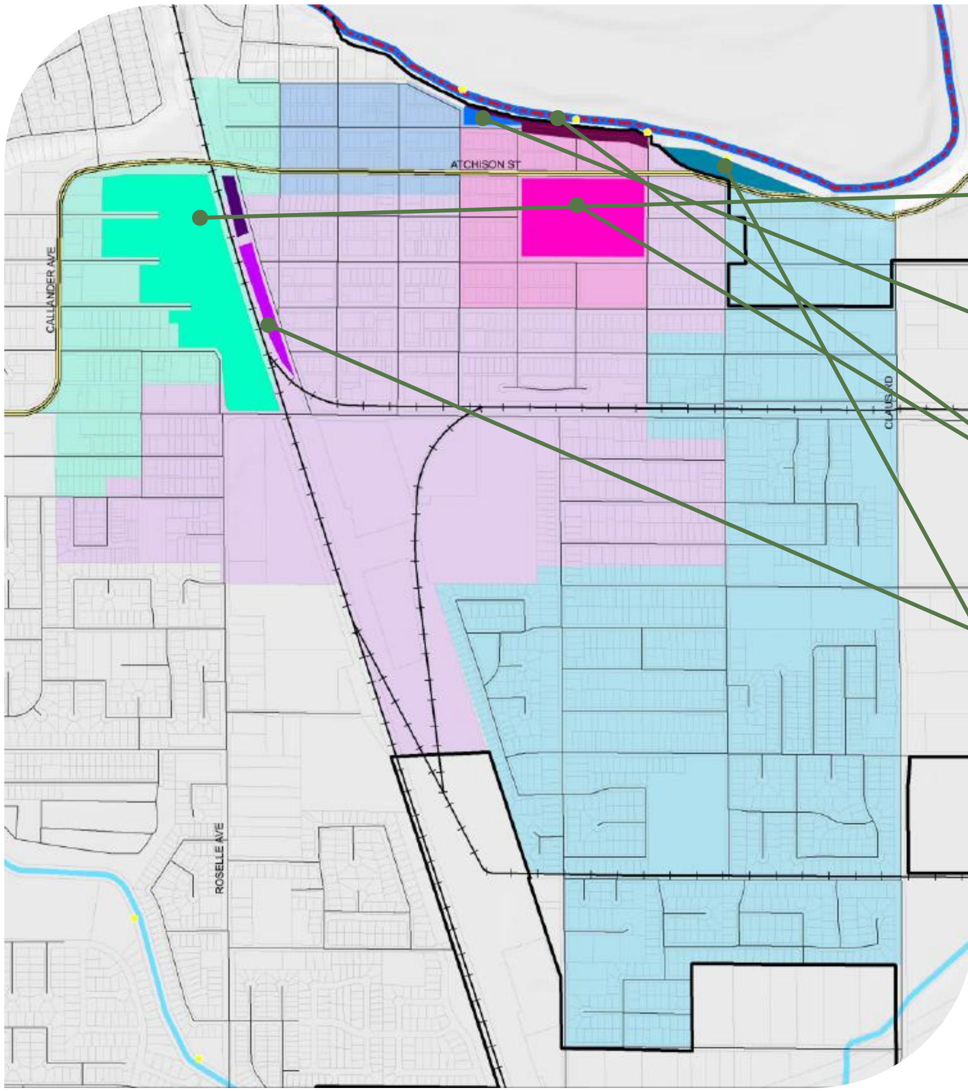
Order-of-magnitude Cost Estimates



Includes

- Site Preparation (clearing, demolition, earthwork, etc.)
- Roadway and Pedestrian Paving
- LID elements (vegetation, amended soil and drainage rock)
- Site Mechanical Supplies (irrigation, new pipes, etc.)
- Construction costs (traffic management, contingencies, overhead, etc.)

Order-of-magnitude Cost Estimates



6 Projects

- **Cannery Sub-watershed**
  - $3.3 million
- **4th Street Sub-watershed**
  - $1.1 million
- **6th Street Sub-watershed**
  - $2.4 million
- **7th Street Sub-watershed**
  - $2.3 million
- **8th Street Sub-watershed**
  - $4.0 million
- **TOTAL**
  - $13 million

DEVELOPMENT FEE STRUCTURE

Funding Sources

- Project Fees (e.g. Development Impact Fee or In-Lieu Fee)
- District Fees/Taxes (e.g. Lighting and landscaping district, community benefit districts)
- City funds (e.g. General Fund, Gas Tax, Stormwater Utility)
- State and Federal Grant and Loans (e.g. Proposition 84, Infrastructure Bonds, Etc.)

Requirements for Development Impact Fee

AB 1600

- Purpose and Use
- Reasonable Relationship / Nexus
- Proportional to Development's Impact / **(Fair Share)**
- Cannot Pay for Existing Deficiencies
- Does not Pay for Operations and Maintenance

Fee Options

Citywide

- Establishes fee for all development
- Benefit and costs assigned to the entire city
- Spreads costs across multiple developments
- City maintenance responsibility

District

- Establishes fee specific to the benefit area
- Benefit and costs are assigned specific to districts
- Fees vary by district and cost sharing arrangement
- District operations and management system

Option 1 - Citywide

Citywide Summary

$ 13,423,000	**TOTAL**
$ 7,748,487	Development Fee
$ 5,674,513	(Citywide Fee)
$ 5,750,000	Available Federal & State Grants
$0	Total Local Match

Development Fee Estimate

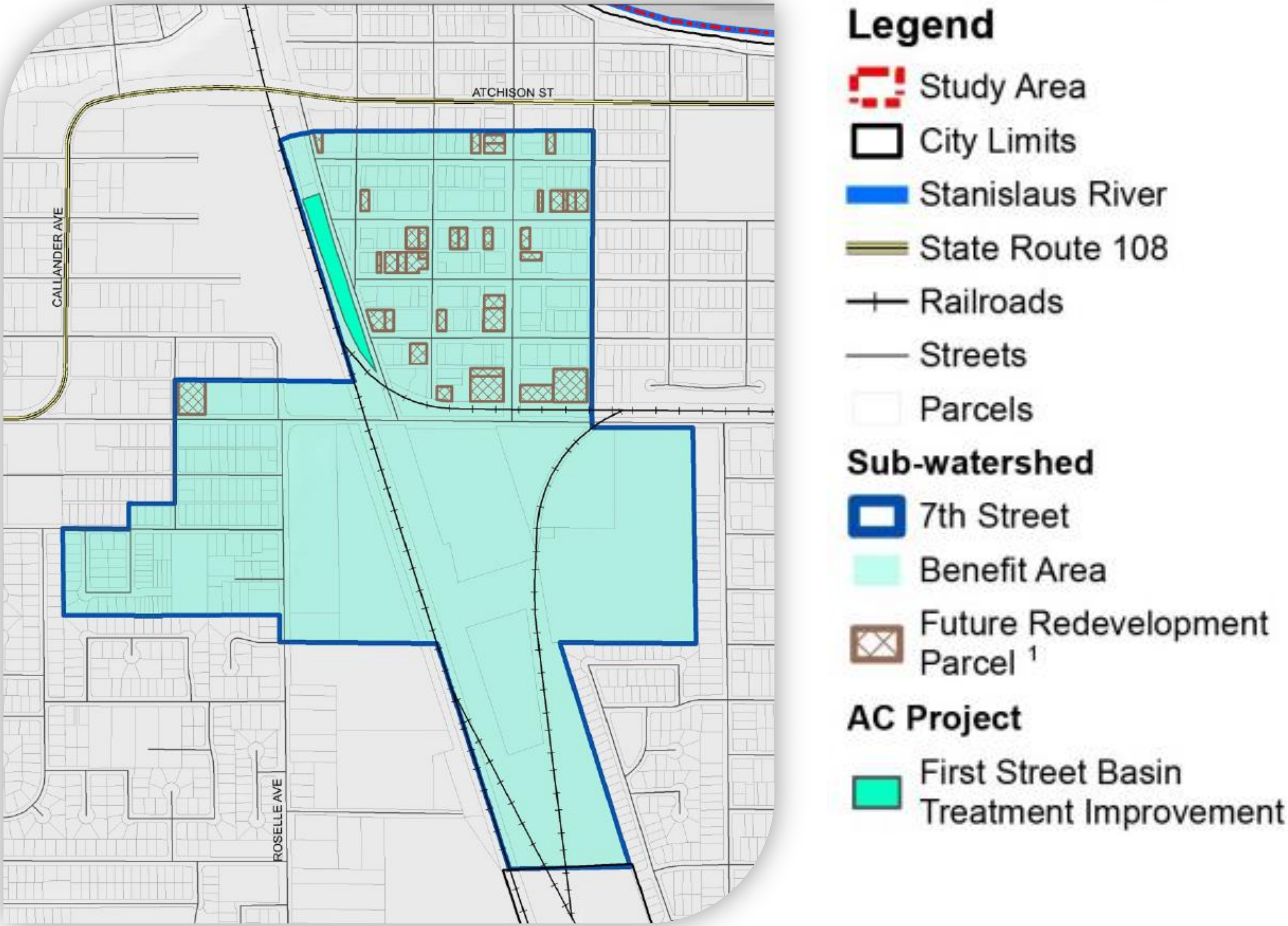
$ 13,423,000	**TOTAL**
58%	Share to New Development (% of Runoff)
$ 7,748,487	Cost to New Development (Aggregate Impact Fee)
$ 21,117	Cost per Acre-Foot of Runoff

Development Fee Program

Land Use	Cost Per Unit	Total Cost
Residential	Per DU	
Clustered Rural	$ 935	$ 233,766
Lower Density	$ 845	$ 3,725,051
Medium Density	$ 339	$ 1,513,672
Higher Density	$ 390	$ 557,491
Mixed Use	$ 291	$ 49,414
Non-residential	Per SF	
Community Commercial	$ 0.50	$ 411,783
Mixed Use	$ 0.51	$ 208,647
Industrial / Business Park	$ 0.50	$ 922,394
Office	$ 0.50	$ 126,280
		$ 7,748,487 (58%)

Option 2 – District Level

Benefit District – First Street Basin Treatment Improvements



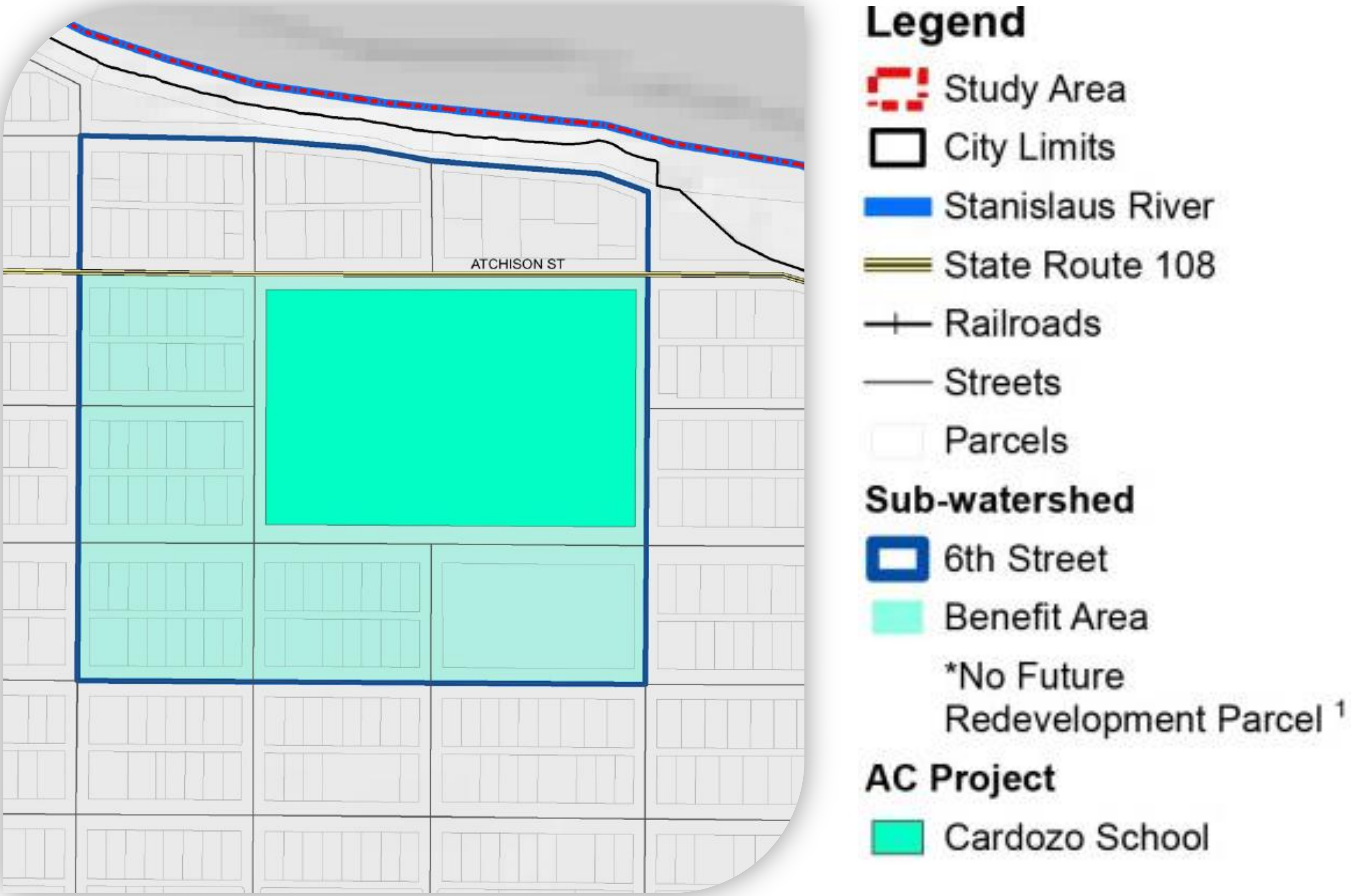
Districtwide Summary – First Street Basin

$ 2,248,000	**TOTAL**
$ 616,407	Development Fee
$ 1,631,593	(Existing Development Fee)
$ 750,000	Available Federal & State Grants
$ 881,593	Total Local Match

Development Fee Estimate

$ 2,248,000	**TOTAL**
27%	Share to New Development (% of Runoff)
$ 616,407	Cost to New Development (Aggregate Impact Fee)
$ 76,806	Cost per Acre-Foot of Runoff

Benefit District – Cardozo School Infiltration Gallery



Districtwide Summary – Cardozo School

$ 1,276,000	**TOTAL**
$ 0	Development Fee
$ 1,276,000	(Existing Development Fee)
$ 750,000	Available Federal & State Grants
$ 526,000	**Total Local Match**

Development Fee Estimate

$ 1,276,000	**TOTAL**
0%	Share to New Development (% of Runoff)
$ 0	Cost to New Development (Aggregate Impact Fee)
$ 0	Cost per Acre-Foot of Runoff

State and Federal Resources

- 16 Federal and State Nexus Grants Identified
  - Award Criteria
  - Available Funds
  - Maximum Award
  - Project Nexus

		Funding						
	Grant Title	Total	Max per Grantee	Matching	RFP Deadline?	Award Criteria Description: Projects must	Donor / Awarding Body	Example Projects
State	**State Transportation Improvement Fund (STIF)**	$ 1.2 billion [2014]	Depends according to a county-weighting formula; smallest (Alpine County), to largest (Los Angeles County)	N/A	Rolling	demonstrate improvements to sustainability and safety	**Cal Trans**	Ventura, CA Green Streets
	Environmental Enhancement and Mitigation (EEM) Program	$ 7 million / fiscal year	$500,000 per project, up to $1 million if including land acquisition	Not required	7/13/2015	contribute to mitigation of the environmental effects of transportation facilities; offer mitigation through urban forestry, resource lands, or other projects beyond the scope of the lead agency	**California Natural Resources Agency**	Los Angeles, CA ($712,000) Hollywood Beautification Team Tree Planting & Community Greening Project; Tulare, CA ($458,200) SR 99-Cartmill Ave Interchange Landscaping Project
	Drought Response Outreach Program for Schools (DROPS)	$25.5 million	$50,000 up to $2.5 million based on school district size	10-20%, of total project cost, based on school district size	1/15/2015	provide drought mitigation measures on school properties (including Indian land)	**State Water Resources Control Board (SWRCB)**	None listed on program website at this time
	Underground Storage Tank Cleanup Fund (USTCF)	funding is based on a per gallon fee on petroleum stored in USTs; $2.9 billion since 1992; $255 million (2010/11)	$ 1.5 million less the claimants deductible	Not required	rolling	have storage tanks (water and petroleum or other chemicals) that require repair or reconstruction. Provides reimbursement for expenses associated with the cleanup of leaking USTs.	**SWRCB**	Gonzales, CA ($480,000 Grant with $55,000 matching funds)
	Clean Water Act State Revolving Fund (CWSRF) *(loan program providing low cost financing)*	$4.5 billion annually	Can finance projects from <$1 million to >$100 million	No (loans average 1.7% interest up to 20 year)	rolling	demonstrate improvements involving water quality, protecting aquatic wildlife, protecting and restoring drinking water sources, and/or preserving our nation's waters for recreational use	**Environmental Protection Agency (EPA) and SWRCB**	Hermosa Beach, CA Infiltration Trench; El Cerrito, CA Green Streets Rain Gardens; Redondo Beach, CA Alta Vista Park Diversion & Reuse Project
	Water Quality, Supply, and Infrastructure Improvement Act of 2014	$ 7.545 billion	$ 50 million	Grant guidelines still under development	Grant guidelines still under development	improve water quality, supply, and/or infrastructure	**State of California (grant process implemented by State agencies: SWRCB, various State conservancies, California Department of Fish and Wildlife, Department of Water Resources, etc.)**	None yet
	Urban and Community Forestry Greenhouse Gas Reduction Fund (GGRF) - 'Woods in the Neighborhood' Grants	$15.7 million total for all GGRF grants (14/15); future funding undetermined at this time	$ 0.2 - $ 1.5 million	Yes (75/25); 25 can be funds or in-kind	2014/2015 grant cycled closed	expend and better the management of urban forests through the purchase a vacant urban parcel or parcels and improving them with vegetation	**State of California Department of Forestry & Fire Protection (CalFire)**	Grants to be awarded by June 2015
	Urban and Community Forestry GGRF - 'Green Innovations Project' Grants	$15.7 million total for all GGRF grants (14/15); future funding undetermined at this time	$ 0.2 - $ 1.5 million	Yes (75/25); 25 can be funds or in-kind	2014/2015 grant cycled closed	be unique and forward-thinking urban GI projects that demonstrate greenhouse gas reduction, with strong focused on environmental justice communities	**CalFire**	Grants to be awarded by June 2015
Federal	**Cooperative Endangered Species Conservation Fund (Section 6 Grants)**	$ 45.4Million [FY14]	range of grant awards has been between $1,000 and $24 million	Yes (at least 25 percent of the total project cost)	FY 2015 funding closed January 23, 2015	provide general environmental mitigation measures and water improvements in areas with known endangered species	**US Fish and Wildlife Service (USFWS)**	Santa Clara County, CA: Santa Clara Valley HCP/NCCP ($2,000,000); San Bernardino County, CA: Metcalf Meadow ($1,197,000)
	Clean Water Act Nonpoint Source Grant (Section 319 Grants)	$ 165 Million (per Fiscal year)	$750,000 for implementation and $175,000 for planning/assessment projects	Yes (at least 25 percent of the total project cost)	The solicitation process runs from August (of the previous year) through May of the following year when the Grant funding is actually received from EPA	be nonpoint source related project that requires technical assistance, financial assistance, education, training, technology transfer, demonstration projects, and/or monitoring to assess the project's success. Ineligible projects are in areas that are under or affiliated with a NPDES Permit, or address an issue in a land use included in a MS4s Permit.	**Environmental Protection Agency (EPA) with SWRCB**	Los Angeles, CA River Street Biofiltration Project, The Popola Street and Rain Garden Retrofit (HI); Marsh Creek BMP Preserve, Sandy Springs Georgia
	Urban Water Small Grants	$5.3 million since 2012	$ 0.4 - $ 0.6 Million		None at this time	contribute to improved water quality and community revitalization	**Environmental Protection Agency (EPA)**	Portland, Oregon design, planning and performance of water quality sampling and data collection activities; Bozeman, Montana integrated stream monitoring program
	Water Infrastructure and Resiliency Finance Center Funding Environmental Finance Center (EFC) Grant Program	$40 million [FY 2016-2021]; $0 for GY2016	exact amounts for specific awards will depend on the availability of funds and the number of awards made	None required	30-Apr-15	sustainable public-purpose water and other environmental infrastructure systems that identify and support drinking water and wastewater utility water conservation, energy efficiency, management, and capital planning. Available to public and private non-profit universities and colleges and non-profit organizations subject to 2 CRF Part 200 (as applicable).	**Environmental Protection Agency (EPA)**	None yet (pending)
Public-Private Partnership (P3)	**Qualified Public Infrastructure Bonds (QPIBs)** *Still requires approval from Congress*	NA	Tax exempt municipal bonds. Amount variable depending on private sector contribution	NA	NA	airport, port, mass transit, solid waste, sewer, water and surface transportation projects, but only if they are governmentally-owned	**Federal Government in Consortium with Private Parties**	Prince Georges County, MD
	Transportation Investment Center	$ 7.5 Billion	13 Awards 2014	NA	NA	High-Impact Projects deemed worthy of acceleration	**Department of Transportation (DOT)**	Presidio Parkway, California (Under Construction), $852 Million
	Tax-Exempt Private Activity Bond (PAB)	NA	Amount variable depending on private sector contribution	NA	NA	Infrastructure projects with a public benefit	**Issued by local or state government on behalf of private businesses**	Presidio Parkway, California (Under Construction), $852 Million
	Tax Incentive Programs	NA	Amount variable depending on private sector contribution	NA	NA	Environmental and Infrastructure Projects and Programs	**United States Department of Energy (DOE)**	Eugene, OR Biofuel Station w/ green roof, bioswales and rain gardens ($ 250K tax credits)

Grants

Project	Nexus Grant	Assumed Award
First Street Basin	Water Infrastructure and Resiliency Finance Center Funding Environmental Finance Center (EFC) Grant Program	$ 750,000
Hutcheson Park Bioretention	Clean Water Act Nonpoint Source Grant (Section 319 Grants)	$ 750,000
Riverside Drive Green Street	Urban Water Small Grants	$ 500,000
Cardozo School Infiltration Gallery	Drought Response Outreach Program for Schools (DROPS)	$ 750,000
Cannery Site Vegetated Buffer	State Transportation Improvement Fund (STIF)	$ 1,500,000
Open Space Treatment Marsh	Cooperative Endangered Species Conservation Fund (Section 6 Grants)	$ 1,500,000
		$ 5,750,000

Summary

- Citywide fee spreads cost and therefore reduces overall fees.
- Districts without significant infill development would incur higher costs to existing property owners.
- Grants are a critical component for existing development to achieve its fair share of the costs.
- Multiple approaches to operations and maintenance but typically responsibilities are taken on by the City.