



Update on the San Mateo County Reasonable Assurance Analysis

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Note: Results are preliminary/draft and should not be quoted or cited.

Reasonable Assurance Analysis (RAA)

HSPF/LSPC

Data

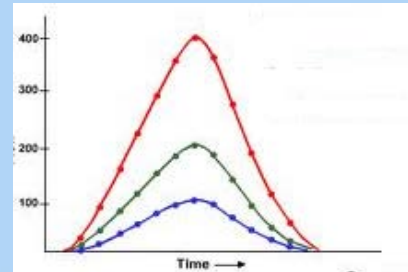
- Rainfall
- HRUs/Land Use
- Impervious
- Elevation
- Slopes
- Evaporation
- Infiltration

Watershed Model



Results

Hourly runoff and
sediment/pollutant
loads



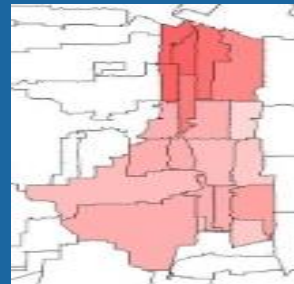
SUSTAIN

Stormwater Capture
Model

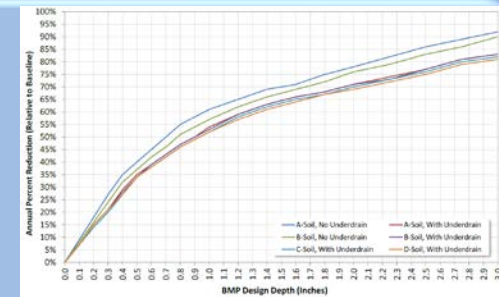


Calculation of
project
capture
volumes

Stormwater
Capture
Model



GI
Response



RAA Guidance

Developing Reasonable Assurance: A Guide to Performing Model-Based Analysis to Support Municipal Stormwater Program Planning

SUBMITTED TO:



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Bay Area Reasonable Assurance Analysis Guidance Document

Prepared for



Prepared by

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engineers | scientists | innovators

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Project Number: WW2282

22 May 2017

External Draft

Identifying the Area of Analysis

- MRP addresses areas that discharge stormwater runoff from storm drains and watercourses within their jurisdictions.
- Areas that can be excluded from the model:
 - Non-urban land areas, including non-urban areas upstream from dams
- Areas to be considered in model but not subject to control measures:
 - Areas that are hydrologically connected to regulated areas that may not be subject to the TMDL and/or the MRP

Selecting or Calculating the Baseline Pollutant Loading

Three options:

1. Utilize the baseline loading presented in the TMDL Staff Reports (SFBRWQCB, 2006; SFBRWQCB, 2008).
2. Utilize the baseline loading produced by the RWSM output for the San Francisco Bay Area MRP region.
3. Recalculate the baseline loading using a calibrated model of the baseline period for the area of analysis

Selecting or Calculating the Baseline Pollutant Loading

- Baseline period for both PCBs and mercury analyses
 - Water years 2000 – 2009 (for long-term continuous simulation)
 - Water year 2002 (for representative year simulation)

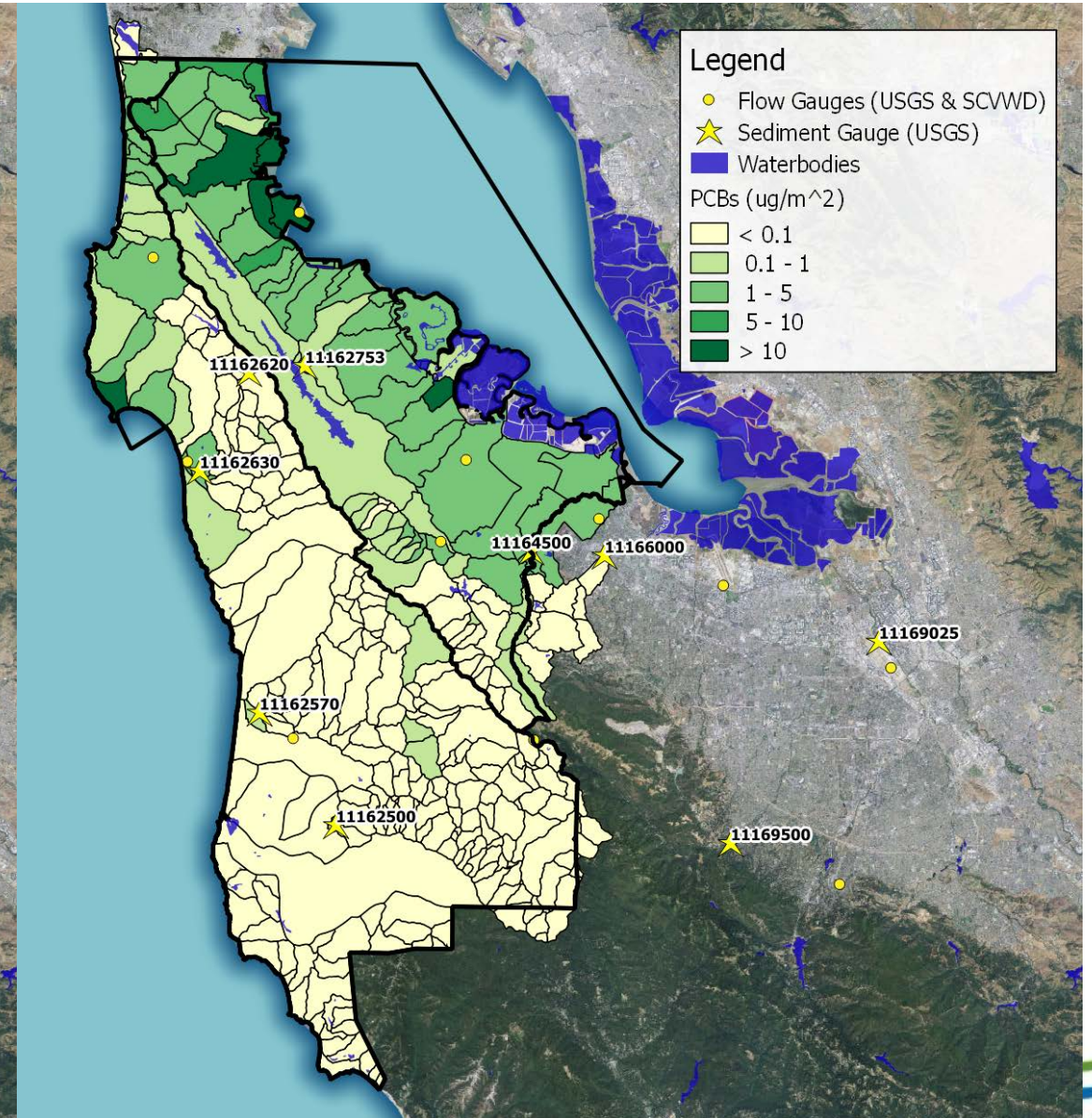
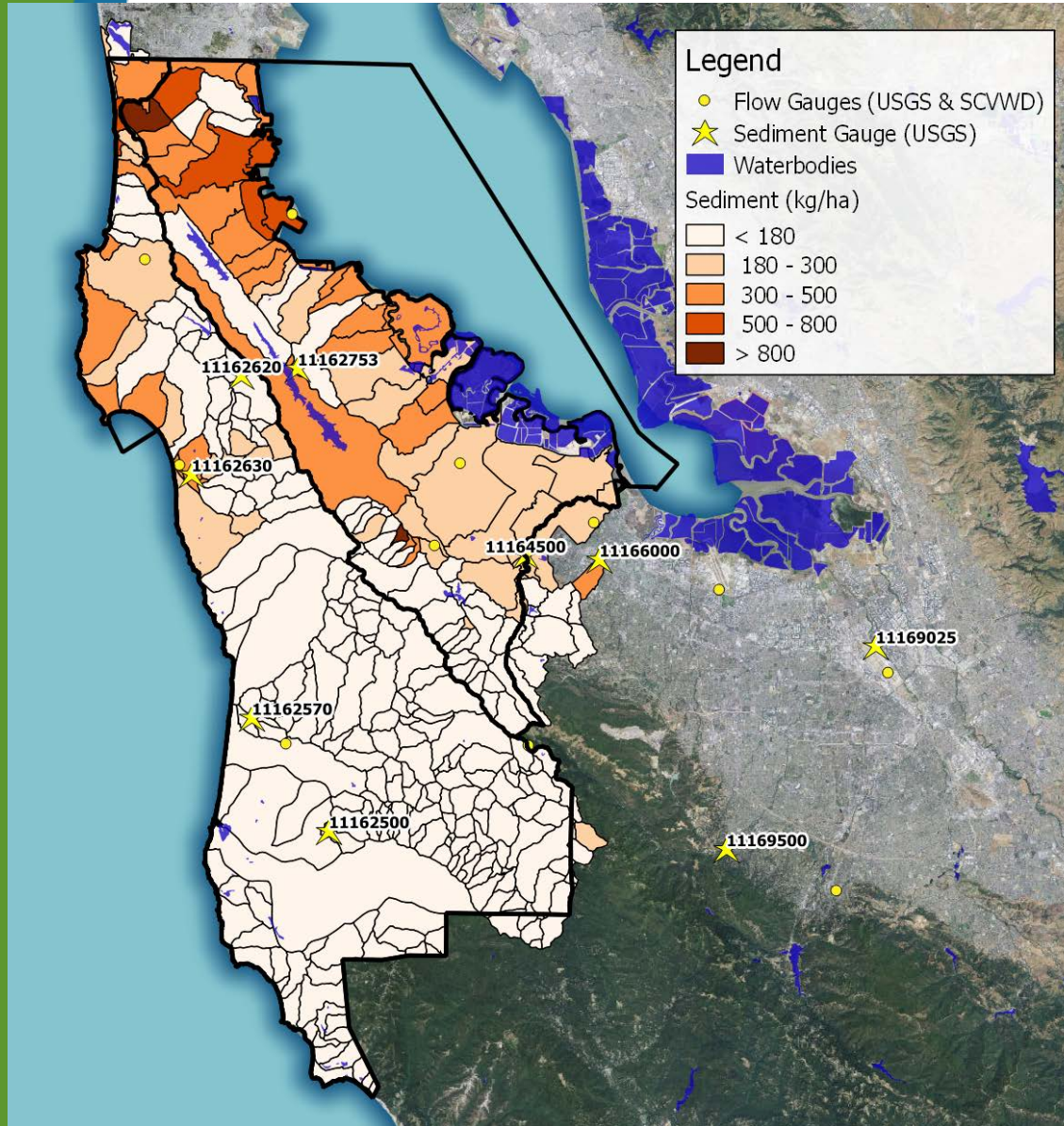
Estimated PCB Runoff Concentrations

Urban	Interest	Area	Runoff Conc. (µg/L)		
	Sub-Category	(ha)	Low	Medium	High
No	Ag/Open	15,055	0.25	0.25	1.5
Yes	New Industrial	1,480	0.25	0.25	1.5
	New Urban	4,107	0.25	0.25	1.5
	Old Industrial	937	60	128	150
	Old Residential	13,460	2	7	12
	Old Urban	9,645	12	30	60
	Source Areas	646	150	222	300
Subtotal:		45,332	--	--	--

Estimated Ranges from RWSM (Preliminary)

Sediment (at Source)

Total PCBs (Delivered to Mouth)



Average Annual Model Results: 10/1/2001 – 9/30/2002

Identifying the Stormwater Improvement Goals

- Load Reduction = Baseline Load – Wasteload Allocation
- GI portion of Load Reduction

Pollutant	Reduction by 2040 (kg/year)	Percent of Reduction
PCBs	3	20.8%
Mercury	10	16.1%

Comparison to PCB TMDL

1	2	3	4	5 = 3 x 4	6 = 2 - 5	7 = 6 / 2
Source	Existing PCB Load (kg/year)	Annual Sediment Load (t/year)	Target Sediment Concentration (µg/kg)	PCB Wasteload Allocation (kg/year)	PCB Load Reduction (kg/year)	Percent Reduction
Bay-wide WLA	20	2,000,000	1	2	18	90.0%
SMC portion of WLA				0.2		

 Reported in the TMDL/MRP

Comparison to PCB TMDL

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Bay-wide WLA	20	2,000,000	1	2	18	90.0%
SMC portion of WLA	2	200,000	1	0.2	1.8	90.0%

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Bay-wide WLA	20	2,000,000	1	2	18	90.0%
SMC portion of WLA	2	200,000	1	0.2	1.8	90.0%
SMC loads based on RAA	1.2	10,000	n/a	0.2	1	83.3%



Based on Modeled Sediment



Based on SFEI RWSM

Comparison to PCB TMDL

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SMC loads based on RAA	1.2	10,000	n/a	0.2	1	83.3%
Load Reduction Achieved Through GI (20.8%)					0.208	17.3%



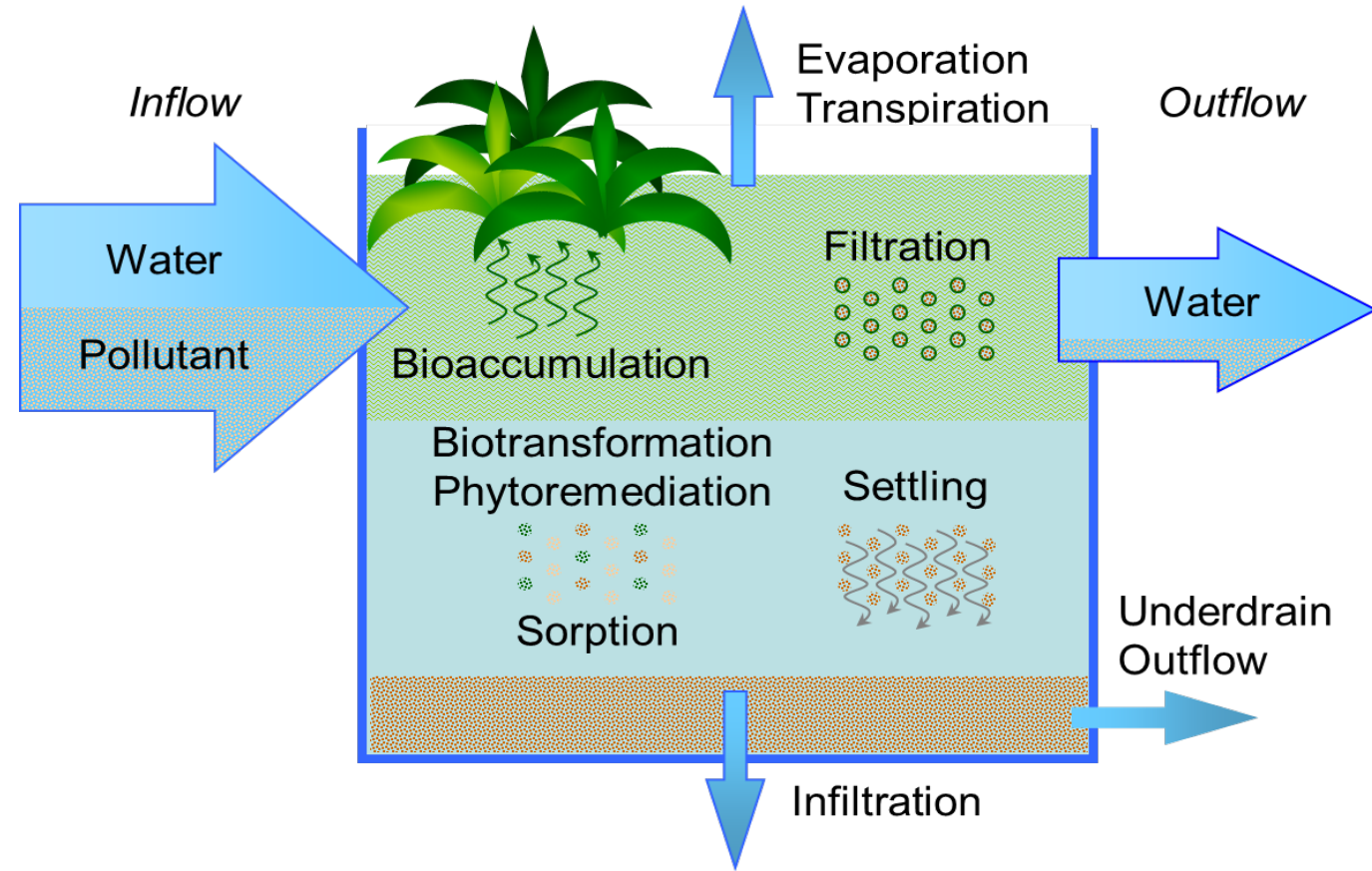
Based on Modeled Sediment



Based on SFEI RWSM

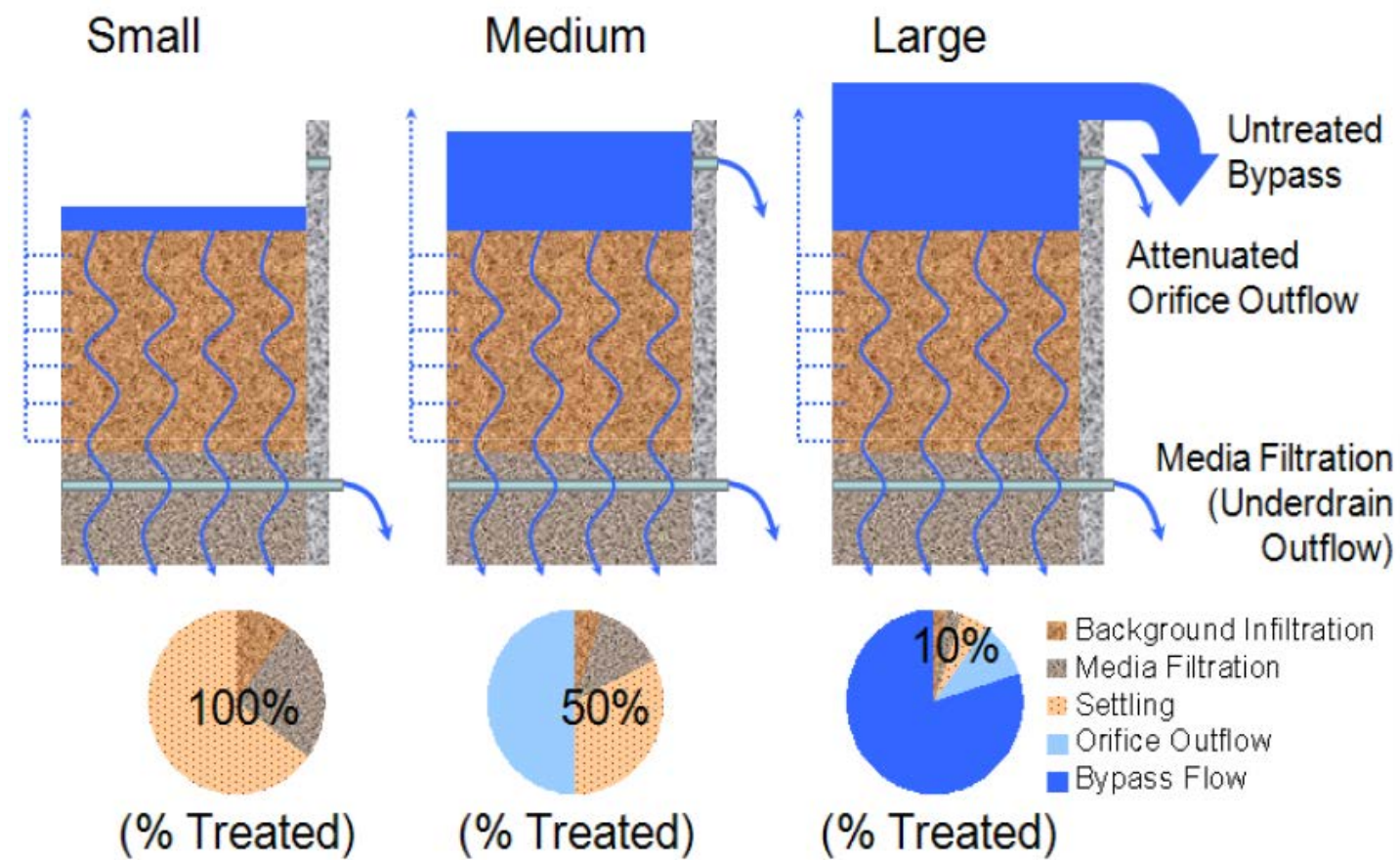
Green Infrastructure Modeling - SUSTAIN

- Process simulation
- Modeling assumptions documented and made available for review in memorandum



Green Infrastructure Modeling - SUSTAIN

- Simulates effectiveness of GI during varying storm sizes and conditions



LID for New/Redevelopment (C.3)

Single-Family (acres)	Multi-Family Residential (acres)	Employer* (acres)	Total (acres)
164.4	476.6	973.9	1,614.9

* Represents an aggregate of retail, service/office, manufacturing, warehousing, and industrial land uses

Green Street Opportunities

- Available from SRP



LID Retrofit Opportunities

- Public parcels

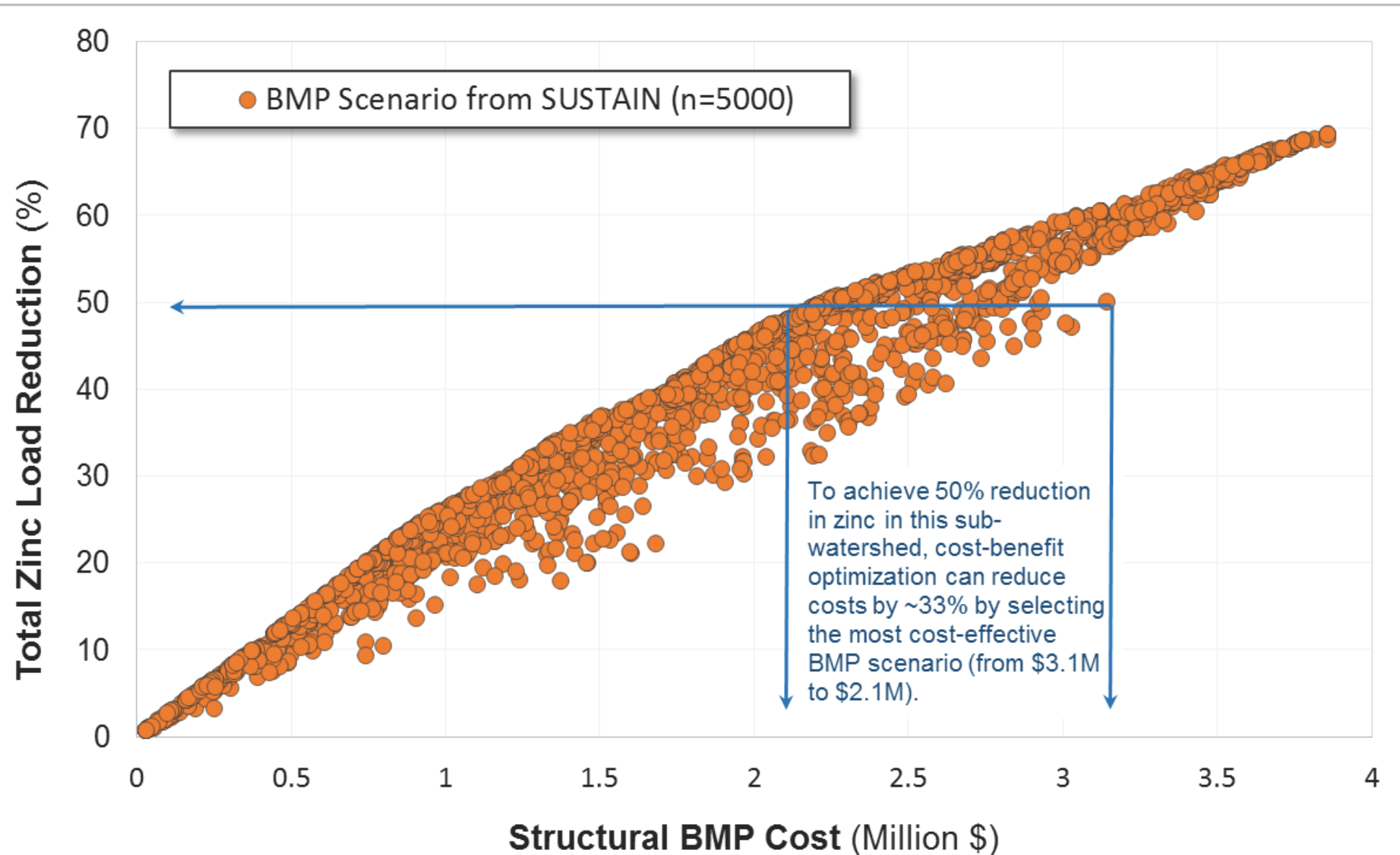


Regional Project Opportunities

- Concepts developed for SRP:
 - Orange Memorial Park
 - Twin Pines Park
- Atherton prepared concept for Las Lomitas Elementary School

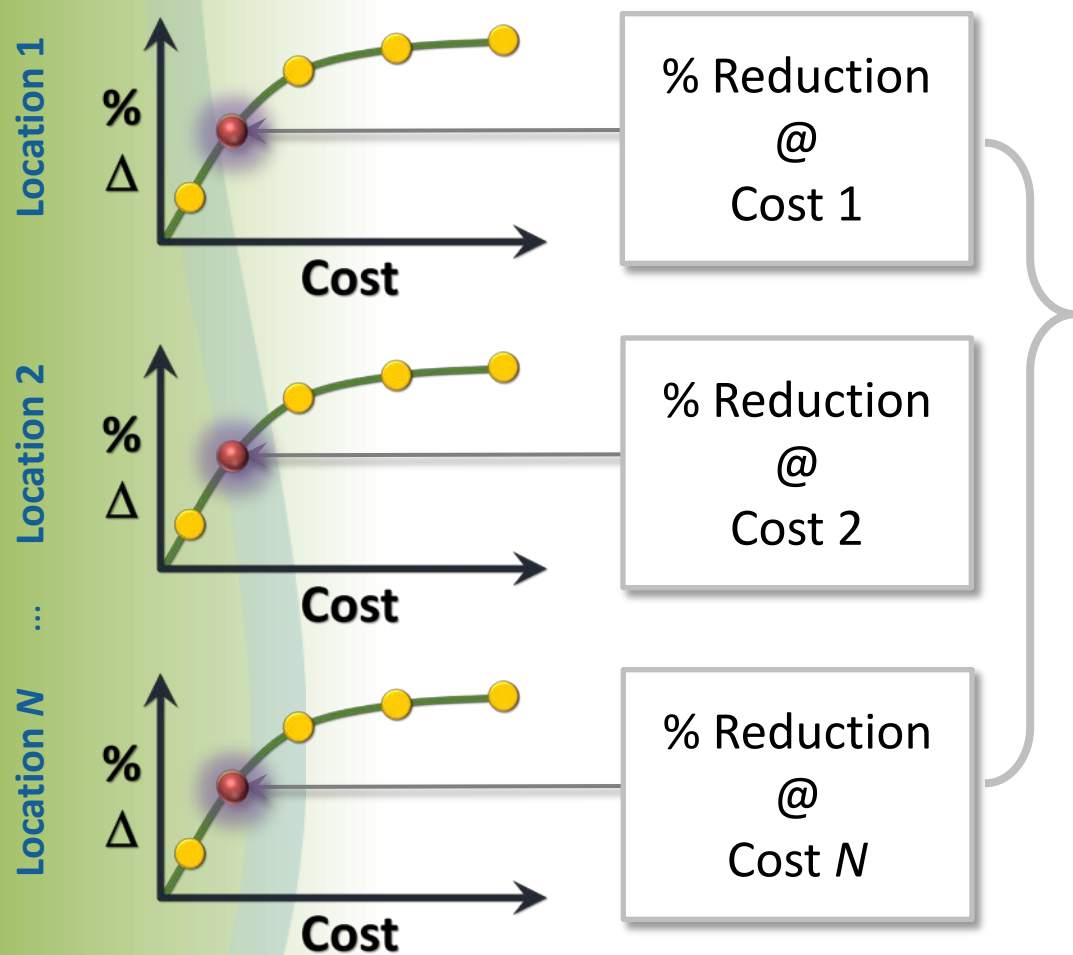


Cost-Effectiveness Curve (Optimization)



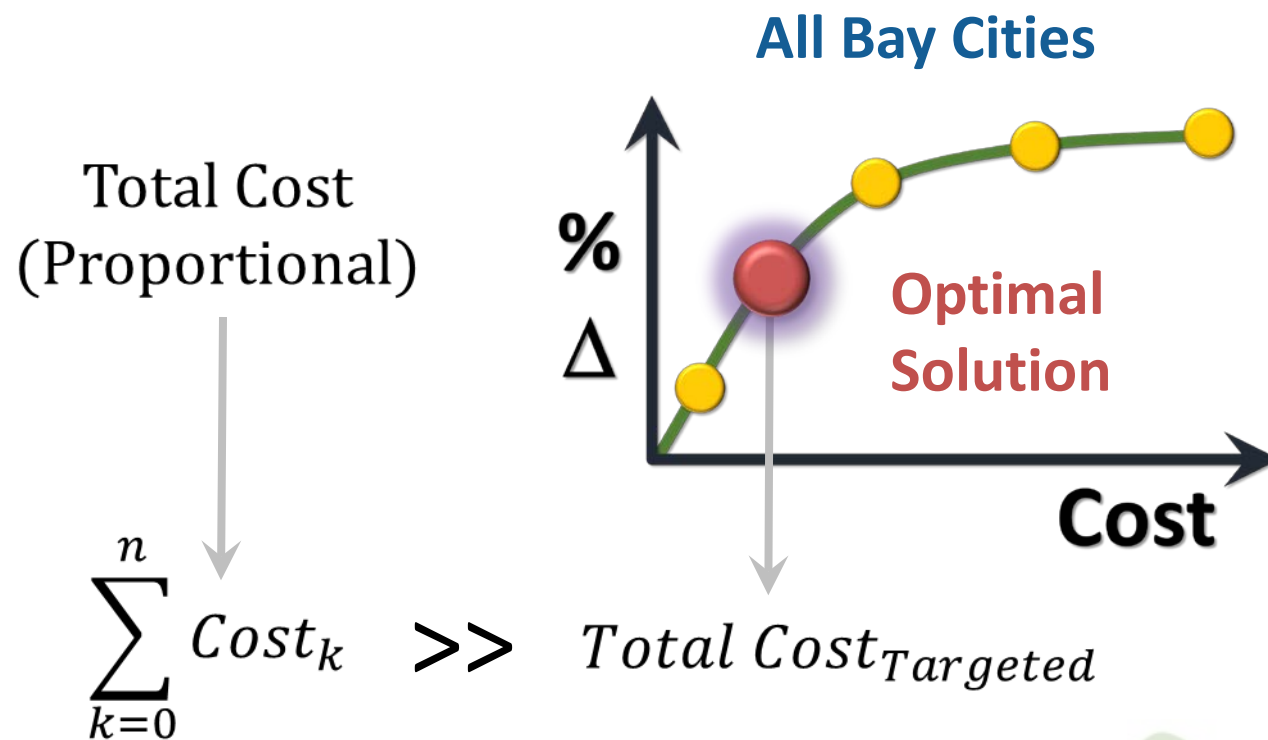
Proportional

Each **location** is responsible for individually achieving the target load reduction



Targeted

Optimization approach reduces total implementation cost by targeting specific source areas across **locational** boundaries



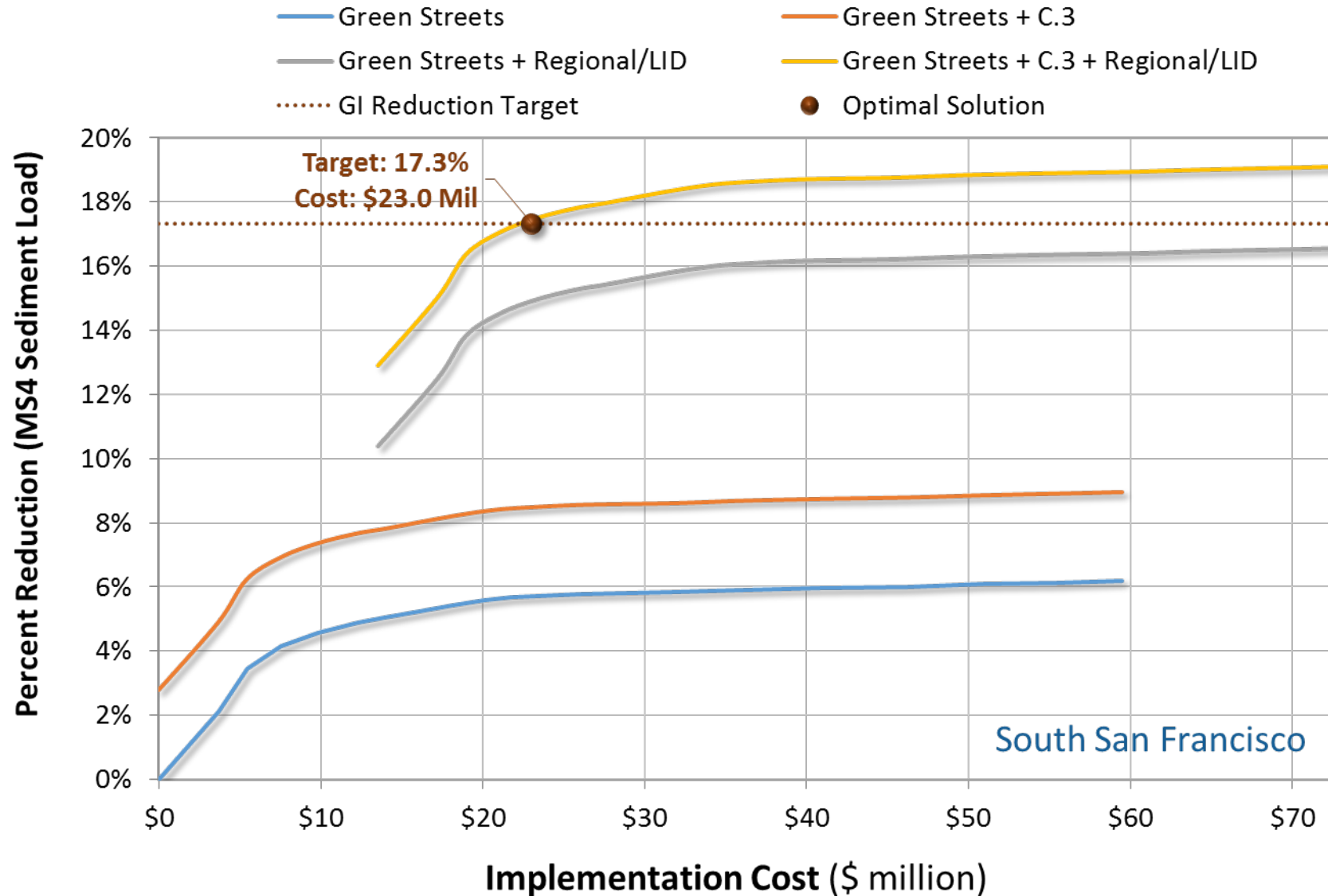
South San Francisco Example

- Proportional Approach
 - Each location achieves the same proportion of maximum available opportunity
- Targeted Optimization
 - Target locations that are most cost-effective for meeting management goals

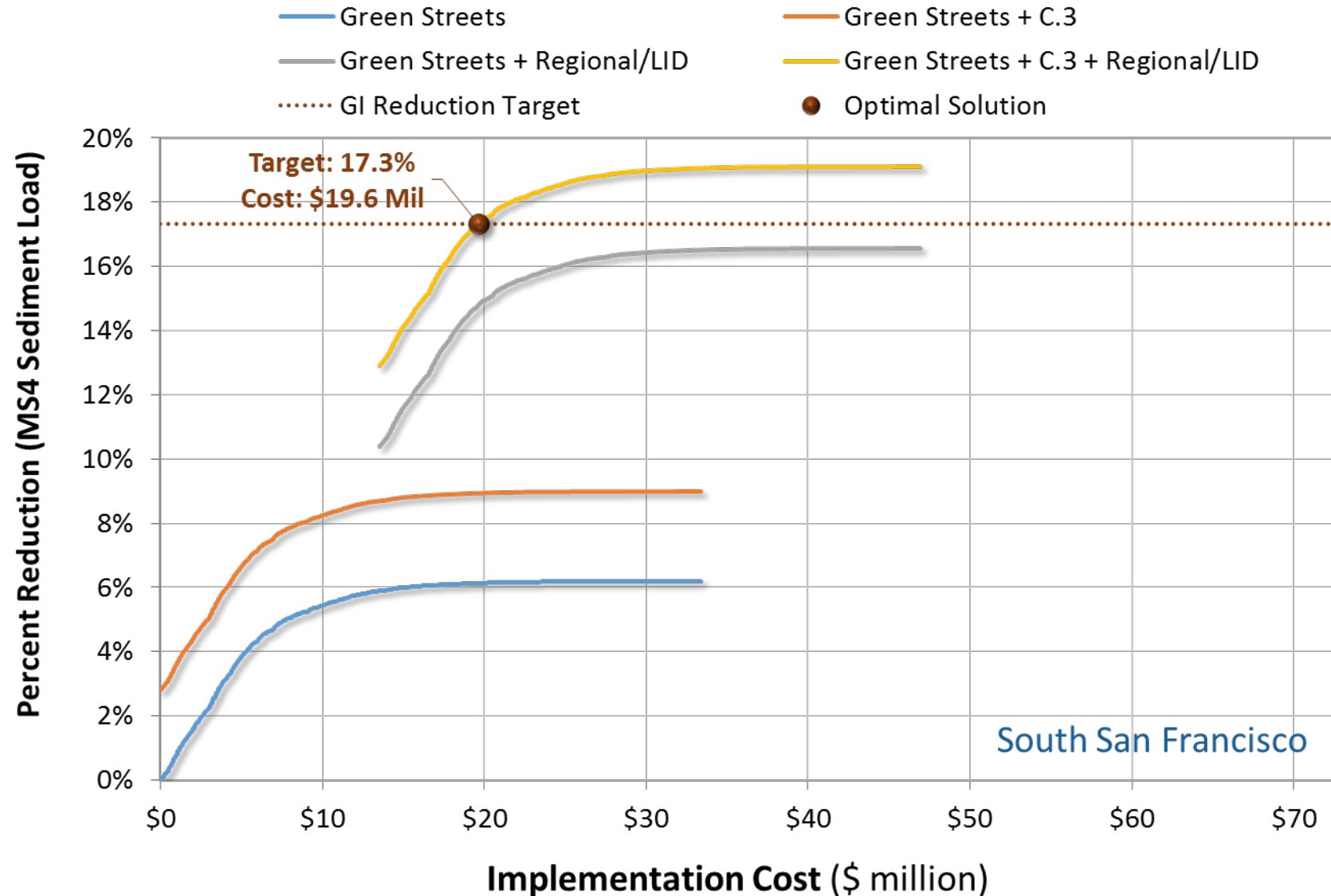
Modeled GI Scenarios

- Green Streets (GS)
 - Screened opportunity (from SRP)
- GS + C.3
 - Screened GS + new/redevelopment LID
- GS + LID/Regional Projects
 - Screened GS + identified regional concepts or LID on public parcels
- GS + C.3 + LID/Regional Projects
 - ALL OF THE ABOVE

Proportional Solution



Targeted Solution



Targeted vs. Proportional

