



Asset Management Program - Watersheds

Presented by
Elizabeth Mercado, P.E.
Senior Engineer, Asset Management Unit

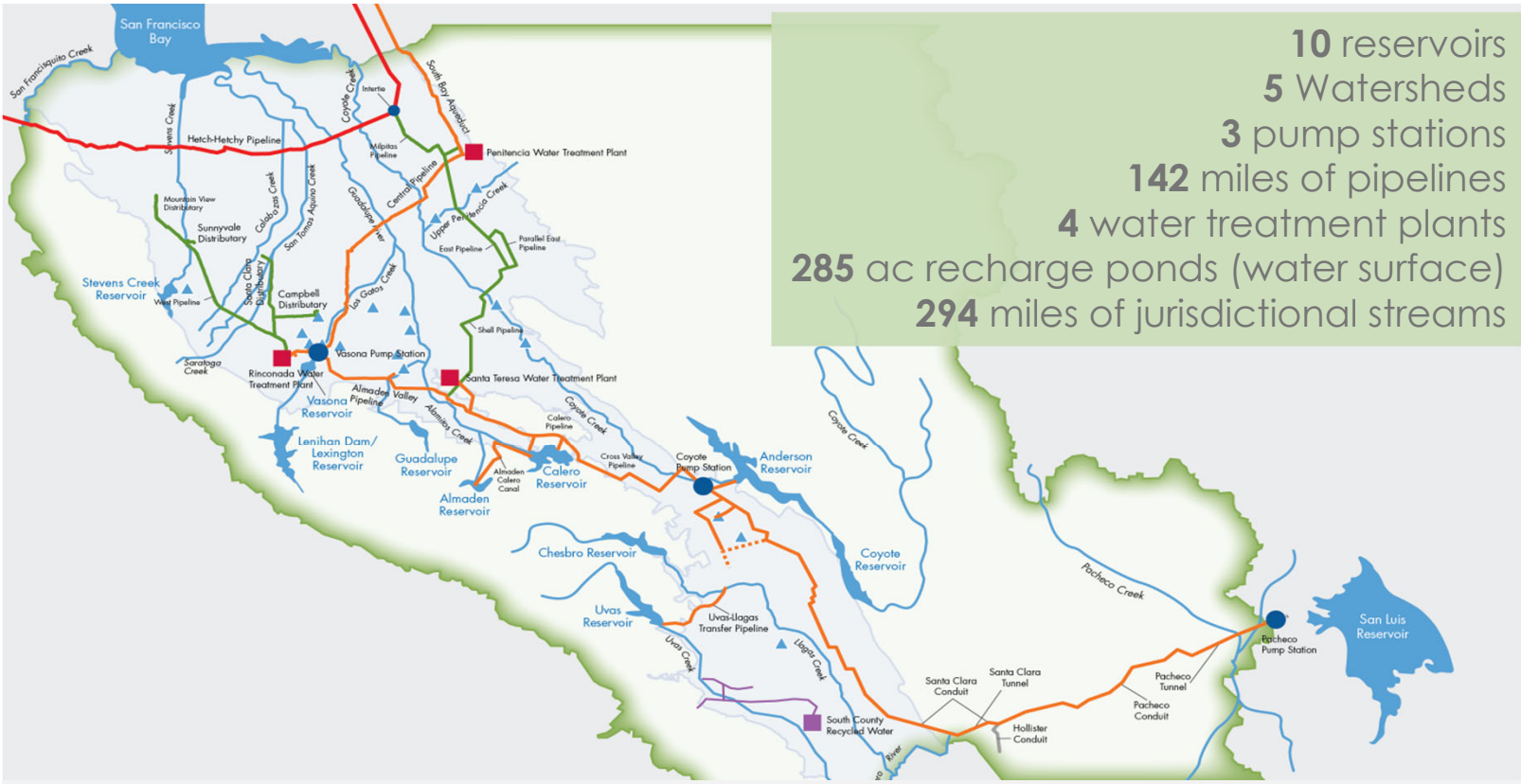
Agenda

2

- Asset Management
 - Asset Inventory & Value
 - Program Model
 - Planning & Implementation Options
- **Developing an Asset Management Plan with Maximo's Support**
 - Watershed Example – Regnart Creek

Valley Water Asset Management

3



10 reservoirs
 5 Watersheds
 3 pump stations
 142 miles of pipelines
 4 water treatment plants
 285 ac recharge ponds (water surface)
 294 miles of jurisdictional streams

Legend

- Raw water
- Treated water
- Water treatment plant
- Recycled water
- Pump stations

valleywater.org

“Minimize asset life-cycle costs while sustainably delivering the levels of service that meet customer expectations at an acceptable level of risk as expressed through the Board.” (I-EL-6.4.a)



Asset Management Programs

4

Water Utility

- 10 Reservoirs
- 142 mi Pipelines
- 3 Potable WTP
- 1 AWPC Plant
- 280 ac Recharge Ponds
- 3 Pump Stations

Watersheds

- 184 Creeks
- 853 mi Creeks
- 294 mi Fee/Easement
- 181 mi Flood Protection

Administration

- 11 facilities
- 924 vehicles and equipment
- Furniture & fixtures

CMMS*/Tools

- Maximo
- AM Planning Tool

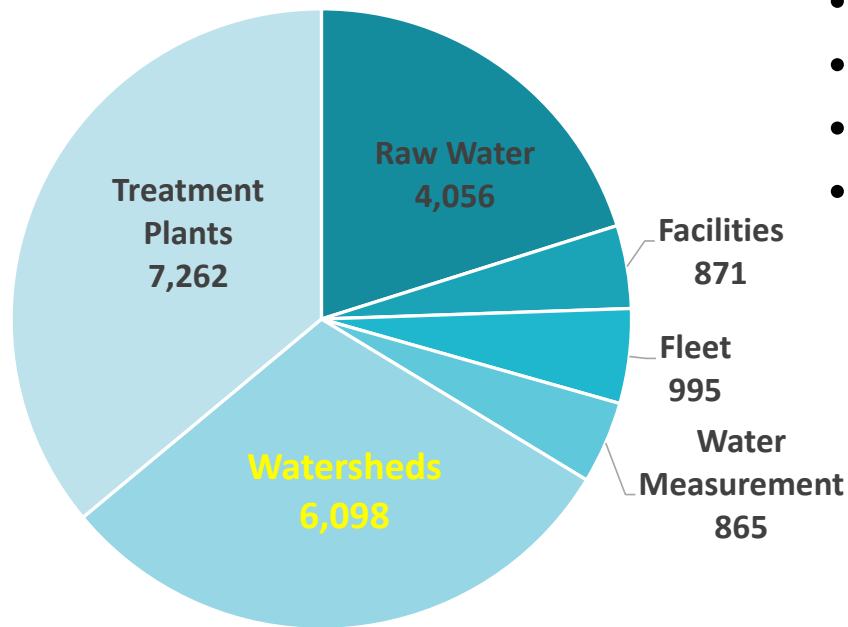
Mobile Condition Assessment Tools

- ESRI GIS Collector & Survey 123
- DatasplICE

*Computer Maintenance Management System (CMMS)

Asset Inventory

20,174 TOTAL ASSETS*

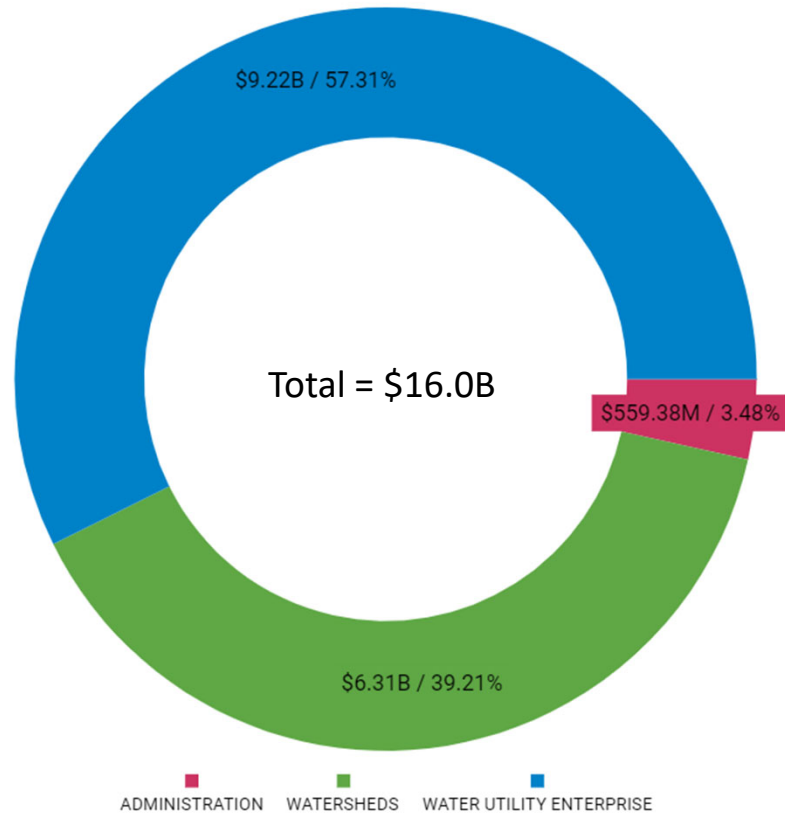


*Capital projects in progress are not included.

Asset

- Greater than \$5,000 or critical for service
- Economic life is greater than 12 months
- Liability if allowed to deteriorate
- Regulatory obligation to inspect/maintain

Asset Value



Asset

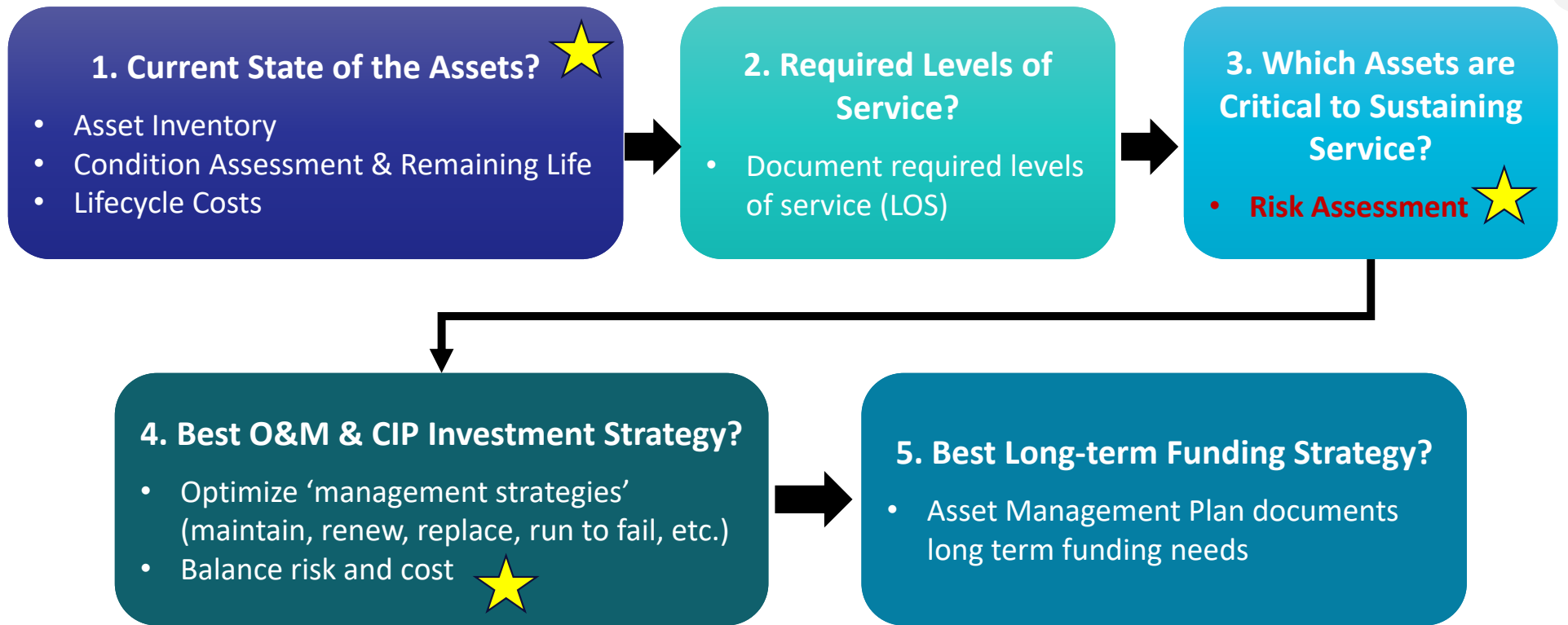
- Greater than \$5,000 or Critical
- Life-cycle is greater than 12 months
- Liability if allowed to deteriorate



**Example of
Watershed
Assets**

Asset Management Planning Model

8



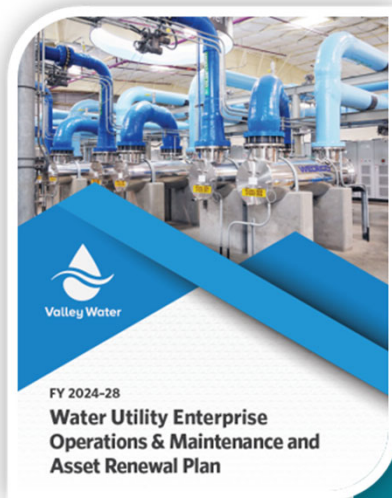
valleywater.org

Asset Management Plans

Five-Year Maintenance/O&M Plans

Asset Management & Master Plans

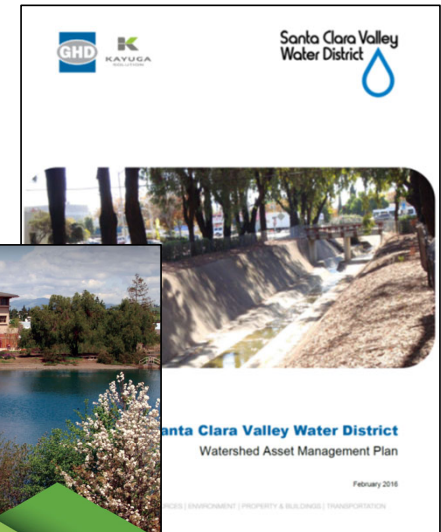
9



5-Year Planning Horizon



San Felipe Division, Reach 1
Asset Management Plan



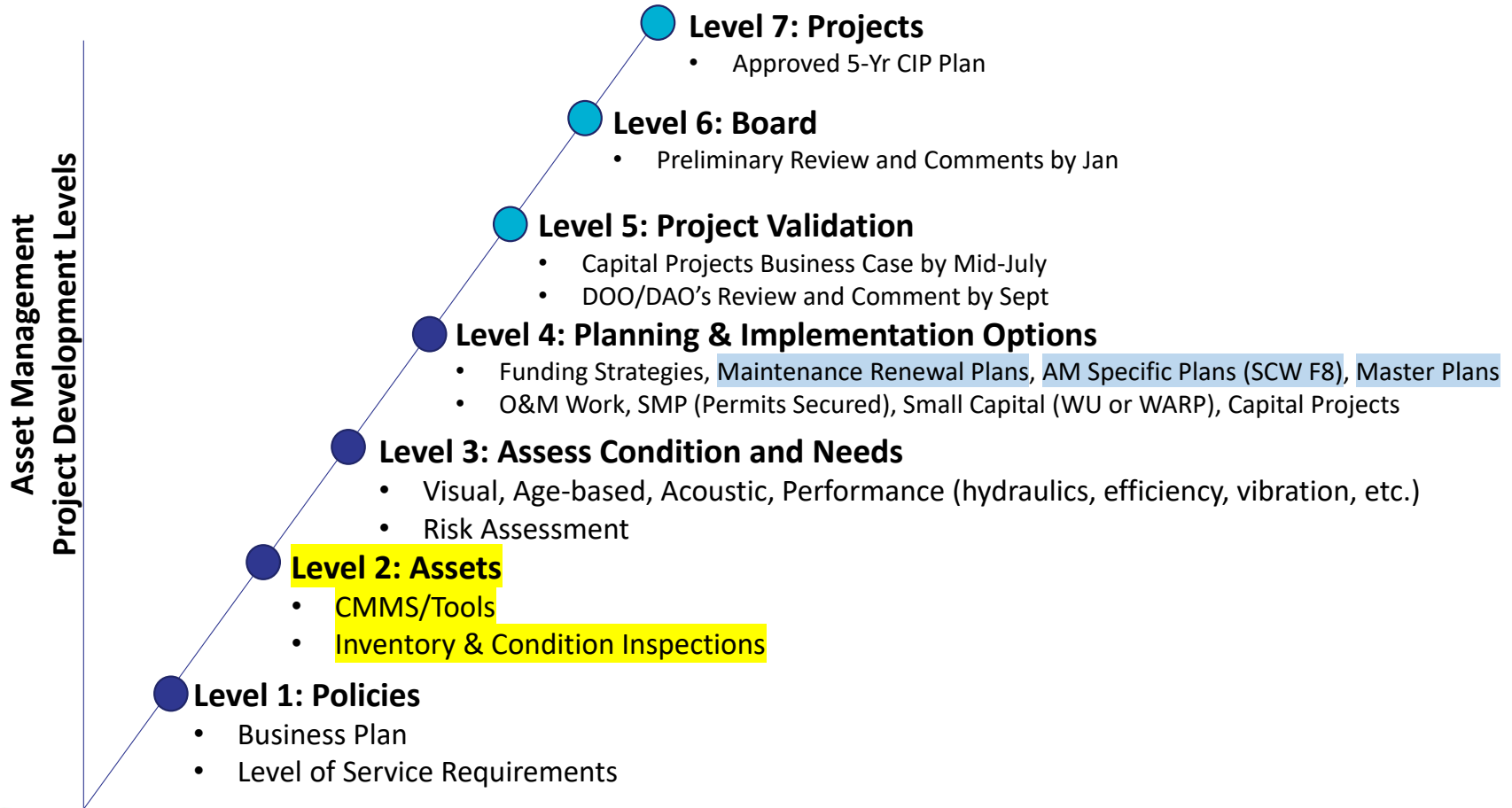
30-100 Year Planning Horizon

valleywater.org



Asset Management Project Development

10



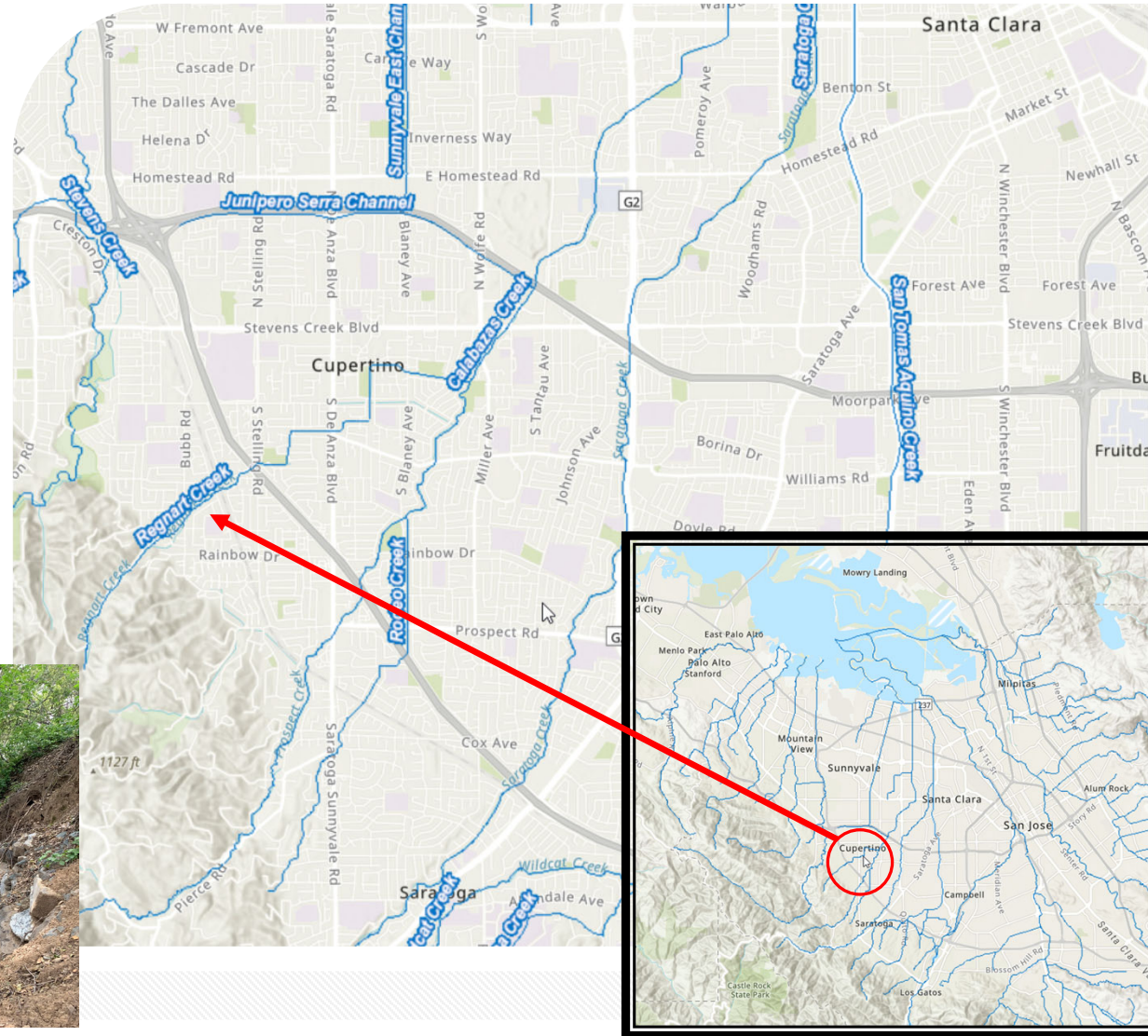
valleywater.org



**Example:
Developing
AMP for
Regnart Creek**

Regnart Creek

- Located in the West Valley Watershed
- Within the City of Cupertino
- 2.9 miles Valley Water owns
- Consists of
 - Trapezoidal Channel
 - Pipe
 - Unmodified/Natural Channel
- Systemic Erosion



Developing an Asset Management Plan (AMP)

13

Main components include:

- Updated Asset Register
- Performed field condition assessments
- Developed Management Strategies for Each Creek Asset Type
- Developed long-term (100-year) Funding Forecast

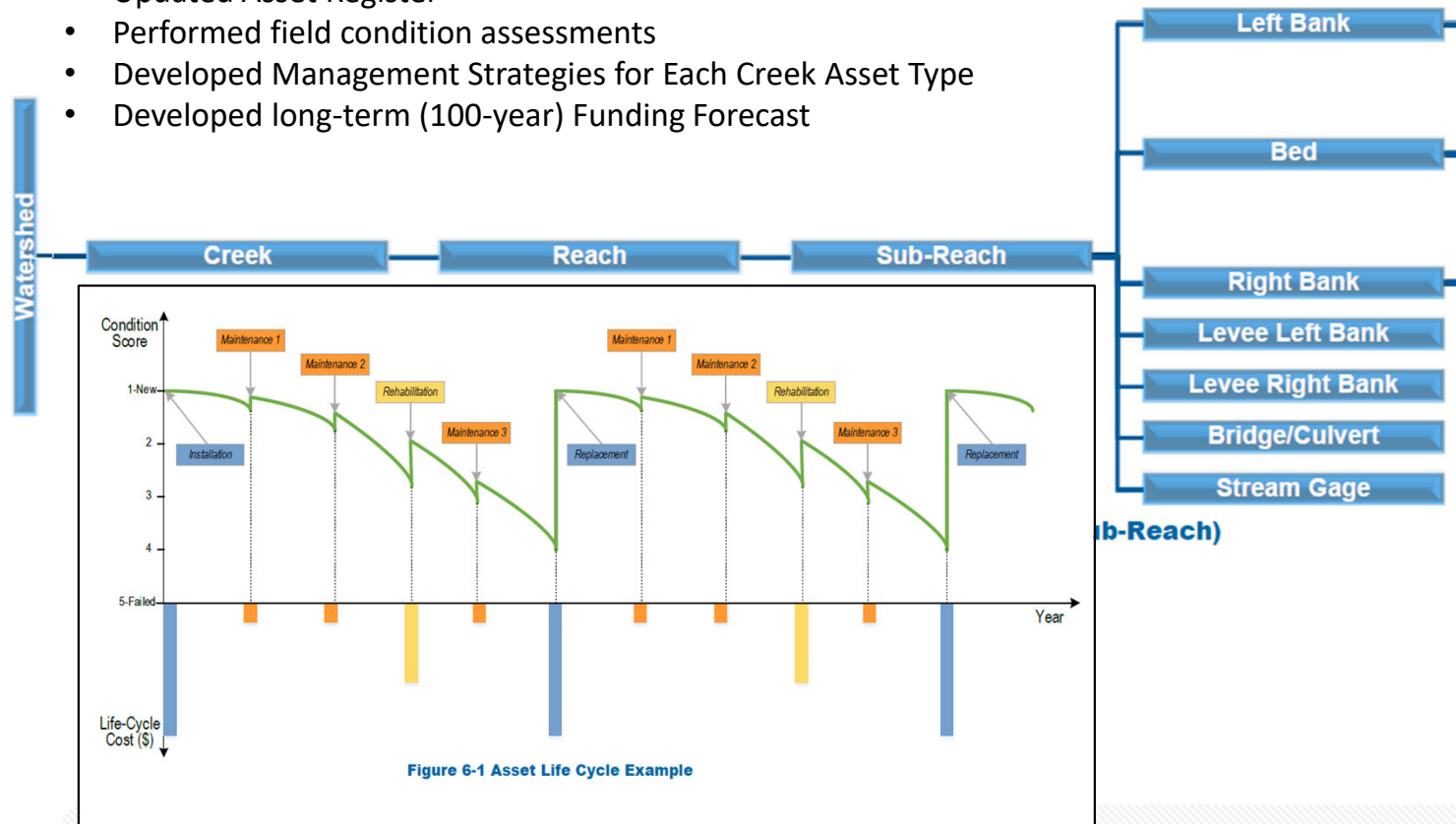


Figure 6-1 Asset Life Cycle Example

Step 1: Creek Level Of Service (LOS)

14



Flood Conveyance/Capacity



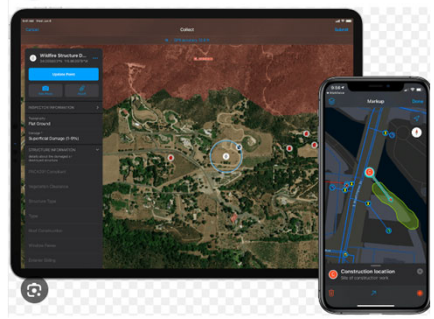
Stability



Water Supply and Habitat



Step 2: Condition Assessments



- Annual inspections with Rating System
- Mobile Device
 - Past: Yuma handheld with Arc PAD GIS
 - Current: Tablet, and/or Phone with ESRI Mobile Applications
- Data from inspections are synced overnight in Maximo

valleywater.org



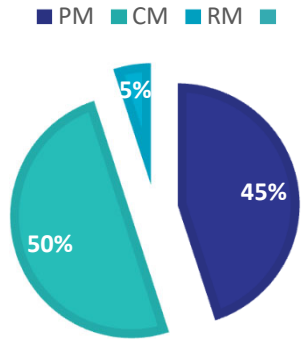
Condition Rating	Definition
1 (A)	Fully functional, new or recently rehabilitated; stable
2 (B)	Good / stable condition
3 (C)	Functional / minor defects. Requires monitoring
4 (D)	Requires corrective action
5 (E)	Failed or unserviceable, unable to satisfy one or more LOS, requires immediate action

Step 3: Review Historical Data

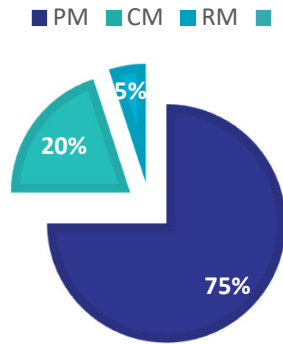
- PM, RM, CM's
- Compare CM vs PM
 - Cost
 - Counts
- Install year & last date
- WO's associated w/conditions



WO COSTS BY TYPE



WO COUNT BY TYPE



Work Order Tracking (ALL)

Find Work Order

Find Navigation Item

Go To Applications

Available Queries

All Records

All Bookmarks

gl account

ALL_WO_WOPERF_BY_USERID_N...

Partusage by Workorder

FY20--AMWP WO

Open-AM-WO-Previous Fiscal Year

WOINT_BY_USERID_N_DIRREPOR...

Common Actions

+ New Work Order

Change Status

Select Owner

Advanced Search Save Query Bookmarks

Work Orders Filter 1 - 20 of 23

Work Order	Description	Work Type	Location
WSH1012857	REGNART CREEK - DEBRIS REMOVAL US AND DS KIM ST	CM	2017900
WSH1013108	OPP IPMP: REGNART CREEK D/S KRZICH PLACE (STA 12,990 - 13,232) 19-SR-004	CM	2017900
WSH1010956	REGNART CREEK CALABAZAS CREEK TO KIM STREET RPR:BTOB AOHW STA 0 - 8,591 (NPW#23-SV-147)	NPW	2017900
WSH1010950	REGNART CREEK CALABAZAS CREEK TO KIM STREET FLOW:VWG STA 0 - 8,591 (NPW#23-SV-146) INSTREAM	NPW	2017900
WSH1010632	REGNART CREEK US ESTATES DR OPP IPMP:UPLAND STA 490 - 650	CM	201790102
WSH1010396	BANK STABILIZATION - REGNART US ANTOINETTE 23-SB-015	NPW	201790105
WSH1010482	REGNART CREEK U/S ANTOINETTE - CHANNEL INVERT REPAIR SMP 23-SB-016	NPW	201790105
WSH1013360	REGNART CREEK U/S ANTOINETTE - CHANNEL INVERT REPAIR SMP 23-SB-016-VEGETATION REMOVAL < 6" DBH - NON-PMA	CM	201790105
WSH1011204	REGNART CREEK TREE REMOVAL (6-12", SMP)-REGNART US ANTOINETTE 23-SB-015	CM	201790105

Step 4: Risk Assessment for Watersheds

17

Business Risk Exposure (BRE) = Probability of Failure (POF) × Consequence of Failure (COF) × Risk Reduction due to Redundancy (R)

Low 0 – 59
Moderate 60 – 74
High 75 - 150

1 = As Built
2 = Good
3 = Monitor
4 = Some Conditions Point to Failure
5 = Falls to Meet LOS

Matrix range 6 – 30 based on economic, social, and environmental factors

= 1
(single channel)

Consequence of Failure (COF) Matrix

Parameters	Impact	Very Low	Low	Medium	High	Critical
	Score	1	2	3	4	5
Social	Service Delivery	Failure of the asset results no impact in ability to achieve service delivery objectives	Failure of the asset likely to result in some service delivery objectives not being achieved (less than 10%)	Failure of the asset likely to result in the inability to perform non-essential service	Failure of the asset likely to result in the inability to perform an essential service but alternatives exist	Failure of the asset likely to result in the inability to perform one or more essential services and no alternatives exist
	Workplace safety	Failure of the asset results in no impact to workplace safety	Failure of the asset likely to cause minor reportable injury	Failure of the asset likely to result in injury to employee	Failure of the asset likely to result in multiple employee injuries or long term disability to employee	Failure of the asset likely to result in the death of an employee
	Public Safety and Well-being	Failure of the asset results in no impact to public safety or well being	Failure of the asset likely to result in minor reduction in public safety and unlikely to cause injury to member of the public	Failure of the asset likely to cause minor injury to public; or create public disturbance	Failure of the asset likely to result in multiple public injuries or long term disability to member of the public	Failure of the asset likely to result in the death of member of the public
Environment	Duration of damage	Failure of the asset does not damage environment	Failure of the asset likely to causes non-lasting (short term) repairable damage and expect recovery within one year	Failure of the asset likely to causes medium term repairable damage and expect recovery within 3 years	Failure of the asset likely to causes long term repairable damage, recovery requires more than 5 years and may significantly compromise habitat	Failure of the asset likely to causes environmental damage with lasting consequences (e.g., permanent change to habitat), permanent damage to habitat
Economic	Financial impact	Failure of the asset results in no financial loss. Loss of less than \$25,000.	If the asset fails , the asset can be immediately replaced. Loss of \$25,000 - \$250,000.	Failure of the asset can result in Fines < 1 Million; or can result in moderate impact local businesses or City function. Loss of \$250,000 - \$2.5M.	Failure of the asset can result in Fines to 10 Million; or Uninsured Losses to 10 Million; or negatively impact a number of local businesses within District. Loss of \$2.5 - \$25M.	Failure of the asset can result in Fines > 10 Million; or Uninsured losses > 10 Million. Loss of > \$25M.
	Impact to Reputation	None	Small amount of negative media or complaints to District	Negative media coverage; or attention of Board members	All as before; plus citizens complaint elevated to Board	All as before; potential for criminal charges

Step 5: Develop of Management Strategies

- Review asset registry, conditions, work order and cost history
- Observe geomorphology
- Observe performance
- Review planning documents
- Identify improvements to existing

Condition Assessment Results



Risk Range	Risk Classification	Total Length	Percentage of Total Length
76 or greater	High	720	2%
60 to 76	Medium	7,641	18%
Below 60	Low	33,999	80%

Risk Summary

Step 5: Develop of Management Strategies

- 3 Strategies Developed - Baseline and 2 Alternatives
- Main concepts of Alternative Strategies
 - Coordination of bank and bed improvements
 - Improvements of longer creek segments vs. spot repair
 - Prioritize PM's and proactive repairs



Long Range Funding Forecast Strategy

5-Year Increment	Average Annual Expenditure		
	Alternative 1 Management Strategy	Alternative 2 Management Strategy	Alternative 3 Management Strategy
1 to 5	\$1,740,000	\$6,479,000	\$14,588,000
6 to 10	\$3,742,000	\$1,960,000	\$877,000
11 to 15	\$2,512,000	\$1,226,000	\$1,037,000
16 to 20	\$823,000	\$4,679,000	\$1,293,000
21 to 25	\$4,600,000	\$429,000	\$275,000
26 to 30	\$1,678,000	\$2,120,000	\$1,277,000
31 to 35	\$1,484,000	\$705,000	\$372,000
36 to 40	\$1,326,000	\$421,000	\$275,000
41 to 45	\$619,000	\$452,000	\$376,000
46 to 50	\$3,819,000	\$275,000	\$275,000
51 to 55	\$4,256,000	\$1,769,000	\$3,405,000
56 to 60	\$705,000	\$1,227,000	\$644,000
61 to 65	\$1,335,000	\$2,061,000	\$656,000
66 to 70	\$817,000	\$3,054,000	\$1,701,000
71 to 75	\$1,134,000	\$352,000	\$275,000
76 to 80	\$289,000	\$651,000	\$1,045,000
81 to 85	\$275,000	\$1,089,000	\$827,000
86 to 90	\$352,000	\$421,000	\$275,000
91 to 95	\$550,000	\$452,000	\$376,000
96 to 100	\$2,257,000	\$275,000	\$275,000
Total (100-Year Basis)	\$34,313,000	\$30,097,000	\$30,124,000

Goals for Watershed AM Program

22

- **Improve Condition Assessment Software and Mobile Device** ([Maximo mobile](#))
- **Improve Coordination**
 - **Continue involvement with Planning, Capital Design, O&M, and Budgeting Unit** ([In progress](#))
- **Establish Implementation Process**
 - **Implement management strategies during development of proposed Capital and O&M projects**
 - **Create additional PM's in Maximo**
 - **Create Annual Summary Reports** ([In progress](#))



Questions?



Valley Water

Clean Water • Healthy Environment • Flood Protection

