

# City of Chula Vista Infrastructure Workshop

**April 2nd, 2015**



**The Asset Management Journey**

“above, below, and all around you”



*“The Natural and Built Environment is the Foundation for a Sustainable Quality of Life”*



# Asset Management Program

- **Catching Up \$**
- **Keeping Up \$**
- **Moving Forward \$**



# ASSET MANAGEMENT PROGRAM (AMP)



Building Management System	BMS
Drainage Management System	DMS
Fleet Management System	FMS
General Government Management System	GGMS
Open Space Management System	OSMS
Parks Management System	PMS
Roadway Management System	RMS
Urban Forestry Management System	UFMS
Wastewater Management System	WMS

**9 Asset Management Systems for 100 years of investments**

# Asset Management Program Advisory Committee

## Civic Engagement



***reaching consensus***

# Exploring the City's Infrastructure



# Asset Management Methodology

## Develop Asset Database

- **Document asset owned and managed**

- Asset Inventory
- Condition Assessment
- Asset Valuation
- Asset Hierarchy

## Understand Which Assets are Critical

- **Prioritize the need**

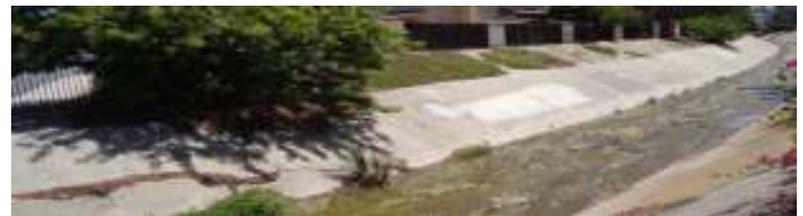
- Criticality Ranking
- Asset Risk

## Life Cycle Cost Assessment

- **Determine what it will take to sustain the delivery of service**

- Catch Up
- Keep Up
- Moving Forward

# Asset Inventory / Data Collection Activities



# Condition Assessment



# ADA Compliance Assessment



# Asset are Mapped



# Assets are Documented and Organized

Asset Hierarchy

Main Hierarchy

- City of Chula Vista
  - Drainage Management
    - Annual Inspection
      - Box Culvert
        - Box Culvert
        - Channel
          - Brow Ditch
          - Channel
          - River
          - Stream
        - Detection Basin
          - Channel
          - Dam
          - Detection Basin
          - Filtration Pond
        - Junction
          - Catch Basin
          - CDG
          - Dynamic Access
          - CMP Rise
          - Concrete Rise
          - Curb Outlet
          - Discharge

Asset Dashboard | Asset Valuation | Install / Consumption Profile | R & R | Risk Matrix | Work Backlog | Asset Register

Search

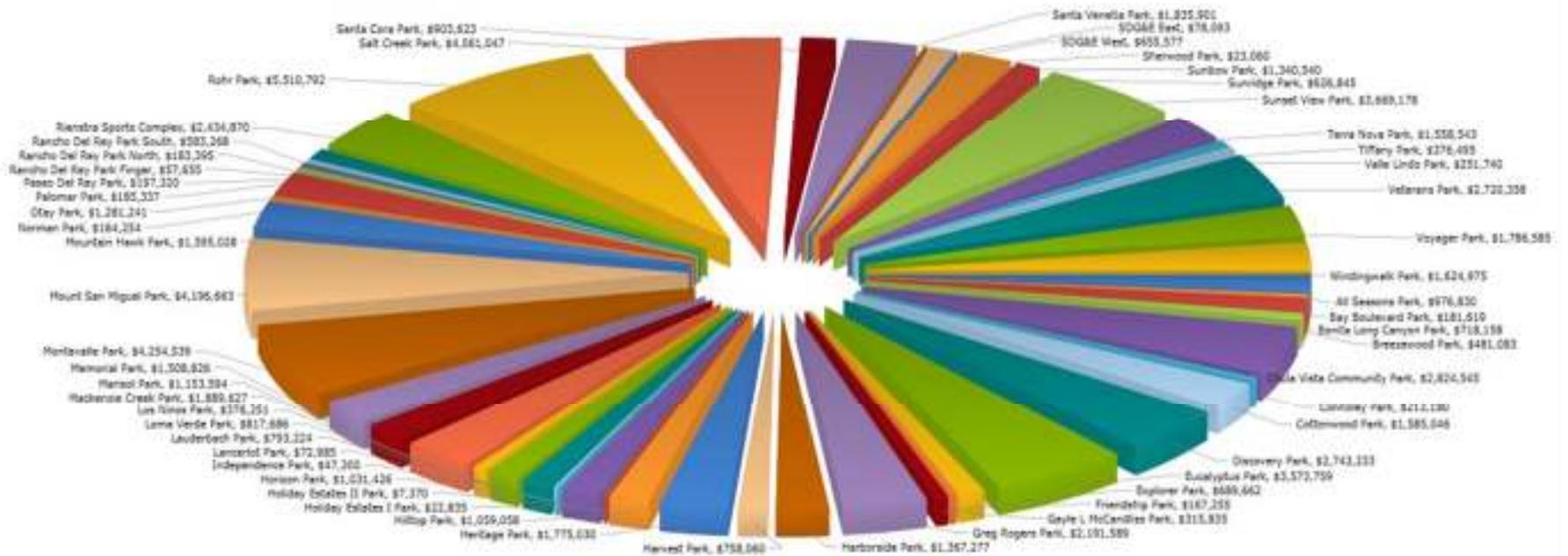
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ID	Name	System	Type	Material	Install Year	Size 1	Unit 1	Size 2	Unit 2	Value	Pop	Col
Mn4030	Box Culvert 4030	Drainage	Box Culvert	CMFA	1976	207 LF		31 IN		\$917,500.00	0.39	3.8
Mn4032	Box Culvert 4032	Drainage	Box Culvert	CMFA	1974	33 LF		31 IN		\$82,500.00	0.41	3.8
Mn4053	Box Culvert 4053	Drainage	Box Culvert	CMFA	1976	150 LF		31 IN		\$375,000.00	0.39	3.8
Mn10717	Box Culvert 10717	Drainage	Box Culvert	CMFA	1982	86 LF		18 IN		\$215,000.00	0.53	3
Mn18823	Box Culvert 18823	Drainage	Box Culvert	CMFA	1982	75 LF		18 IN		\$187,500.00	0.53	3.5
Mn18063	Box Culvert 18063	Drainage	Box Culvert	SBC	2001	142 LF		18 IN		\$355,000.00	0.14	4.1
Mn18064	Box Culvert 18064	Drainage	Box Culvert	SBC	2001	61 LF		18 IN		\$152,500.00	0.14	4.1
Mn21330	Box Culvert 21330	Drainage	Box Culvert	SBC	2001	20 LF		18 IN		\$50,000.00	0.14	4.1
Mn22680	Box Culvert 22680	Drainage	Box Culvert	Sidewalk Underdrain	2005	19 LF		3 IN		\$47,500.00	0.1	3.8
Mn23151	Box Culvert 23151	Drainage	Box Culvert	Sidewalk Underdrain	2005	11 LF		18 IN		\$27,500.00	0.1	3.5
Mn23152	Box Culvert 23152	Drainage	Box Culvert	Sidewalk Underdrain	2005	8 LF		18 IN		\$20,000.00	0.1	3.5
Mn23657	Box Culvert 23657	Drainage	Box Culvert	Sidewalk Underdrain	1977	10 LF		4 IN		\$25,000.00	0.38	2.9
Mn23773	Box Culvert 23773	Drainage	Box Culvert	Sidewalk Underdrain	1981	16 LF		4 IN		\$40,000.00	0.34	3.8
Mn4104	Box Culvert 4104	Drainage	Box Culvert	CMFA	1977	35 LF		24 IN		\$137,500.00	0.38	3.05
Mn10724	Box Culvert 10724	Drainage	Box Culvert	CMFA	1977	49 LF		24 IN		\$122,500.00	0.38	3.05
Mn19531	Box Culvert 19531	Drainage	Box Culvert	CMFA	1977	7 LF		24 IN		\$17,500.00	0.38	3.35
Mn19552	Box Culvert 19552	Drainage	Box Culvert	CMFA	1977	32 LF		24 IN		\$80,000.00	0.38	3.65
Mn4164	Box Culvert 4164	Drainage	Box Culvert	DBC	1983	45 LF		48 IN		\$112,500.00	0.52	4.5
Mn4165	Box Culvert 4165	Drainage	Box Culvert	DBC	1985	268 LF		96 IN		\$920,000.00	0.3	4.3
Mn4207	Box Culvert 4207	Drainage	Box Culvert	SBC	1997	315 LF		18 IN		\$787,500.00	0.58	3.3

Count: 21161

# Asset Valuation (Parks)

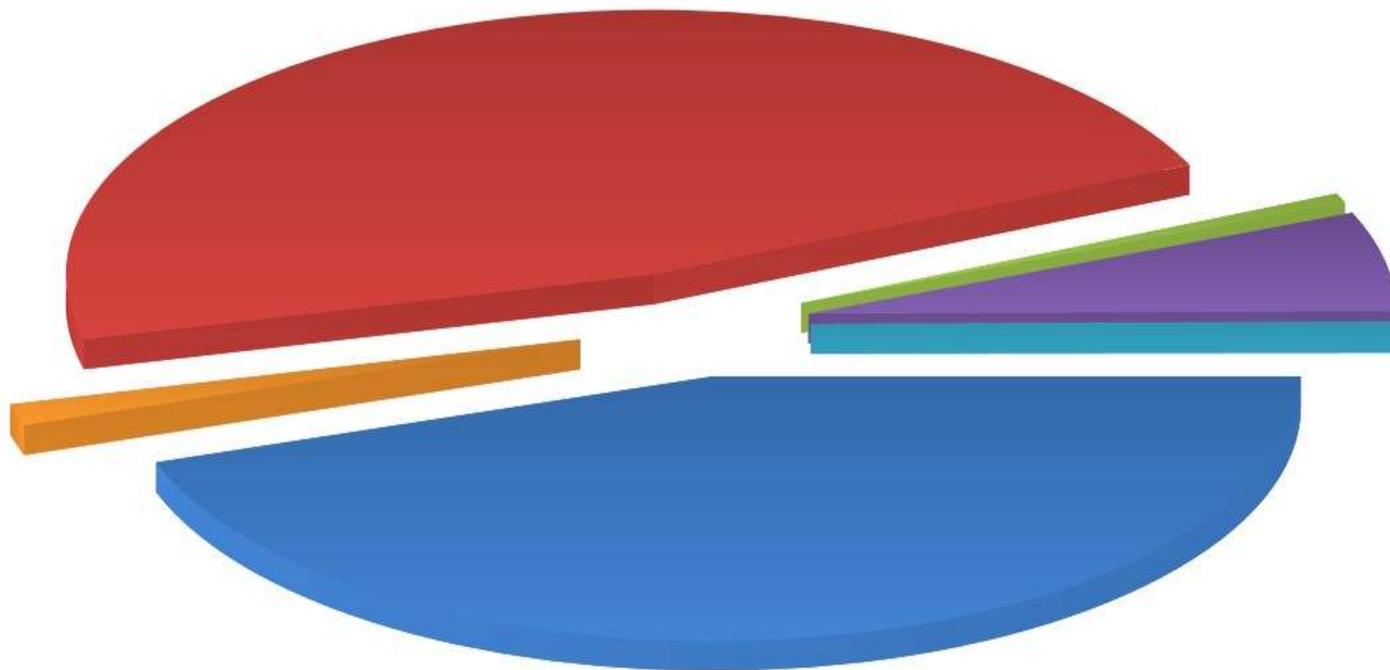
Total Valuation: \$72,045,065



# Asset Valuation

(Urban Forestry)

Total Valuation: \$129,509,400



● Building, \$57,993,200 ● Median, \$1,698,200 ● Park, \$61,124,800 ● Parking Lot, \$733,600 ● Street, \$7,884,600 ● Annual Inspection, \$75,000

# Urban Forestry Sorted by Value and Count

**Total Valuation: \$129,434,400 (29,264)**

Tree Type	Total Valuation
EUCALYPTUS	\$32,109,700
PINE	\$20,568,900
PEPPER	\$18,453,400
PALM	\$22,245,300
SYCAMORE	\$4,635,100
PEAR	\$2,439,800
ASH	\$2,123,200
FLAME	\$2,086,700
PEPPERMINT	\$1,727,300
ELM	\$1,541,100
OTHER	\$21,503,900

Tree Type	Total Count
PALM	3,780
EUCALYPTUS	2,507
PINE	1,964
PEPPER	1,768
PEAR	1,207
FLAME	923
JACARANDA	619
BOTTLEBRUSH	608
BOX	476
SYCAMORE	475
OTHER	14,937

# Risk



**Probability  
of Failure**

Timing to Failure

**Consequence  
of Failure**

Impact of a failure

- Economic
- Environment
- Social

# Pump Station Criticality

G Street	5
Agua Vista	5
PD HQ Sewer Pump	5
OTC-II Pump	3
Hilltop Pump	3
Surrey Pump	2
Corral Ct Pump	2
Civic Ctr/Old PD	2
Salt Creek	1
Parkside Dr Pump	1
Max Field Pump	1
Greg Rogers	1

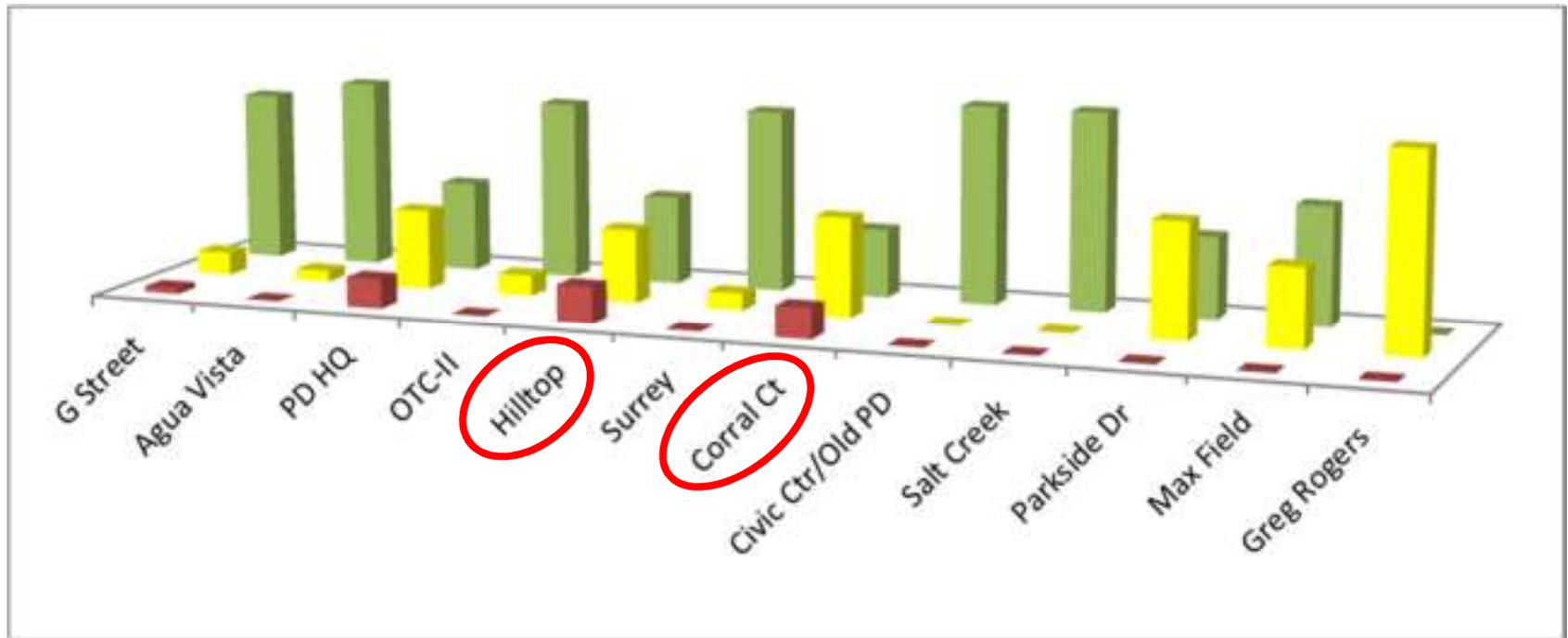
# Criticality by Asset

	Class ID	Asset Class	CoF
CIVIL / SITE			
	BLD	Building	5
	STR	Structure	4
	ENC	Building - Enclosure	1
	WW	Wet Well	5
	YP	Yard Piping	5
	PAV	Pavement	1
	FNC	Fencing	1
	FM	Forcemain	5
	MH	Forcemain Manhole	1
	CO	Forcemain Cleanout	5

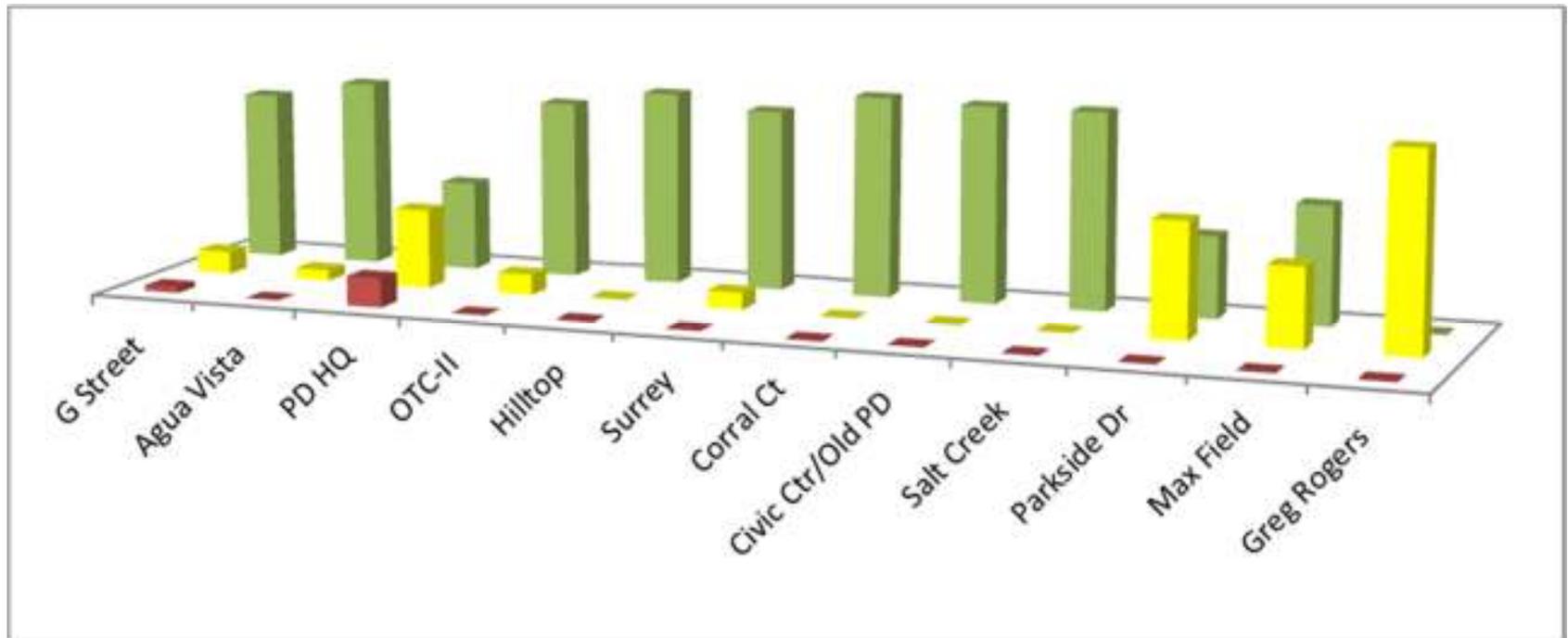
	Class ID	Asset Class	CoF
ELEC / INST			
	SCD	SCADA	3
	INST	Instruments	3
	PNL	Electric Panels	5
	MCC	Motor Control Center	5
	M	Motor	5
	SM	Motor - Small	2
	TR	Transformer	5
	TSW	Transfer Switch	4
	PLC	Programmable Loginc Controller	5

	Class ID	Asset Class	CoF
MECHANICAL			
	ARV	Air Releif Valve	2
	VLV	Valve	3
	AVA	Automatic Valve Actuator	2
	CMP	Compressor	3
	GEN	Genset	4
	CPS	Cathodic Protection System	3
	PMP	Pump	5
	SPMP	Submersible Pump	5
	HC	Hoist / Crane	1
	OTK	Tank - Outdoor	1
	SG	Sluice / Slide Gate	3

# Pump Station Risk 2012



# Pump Station Risk 2015

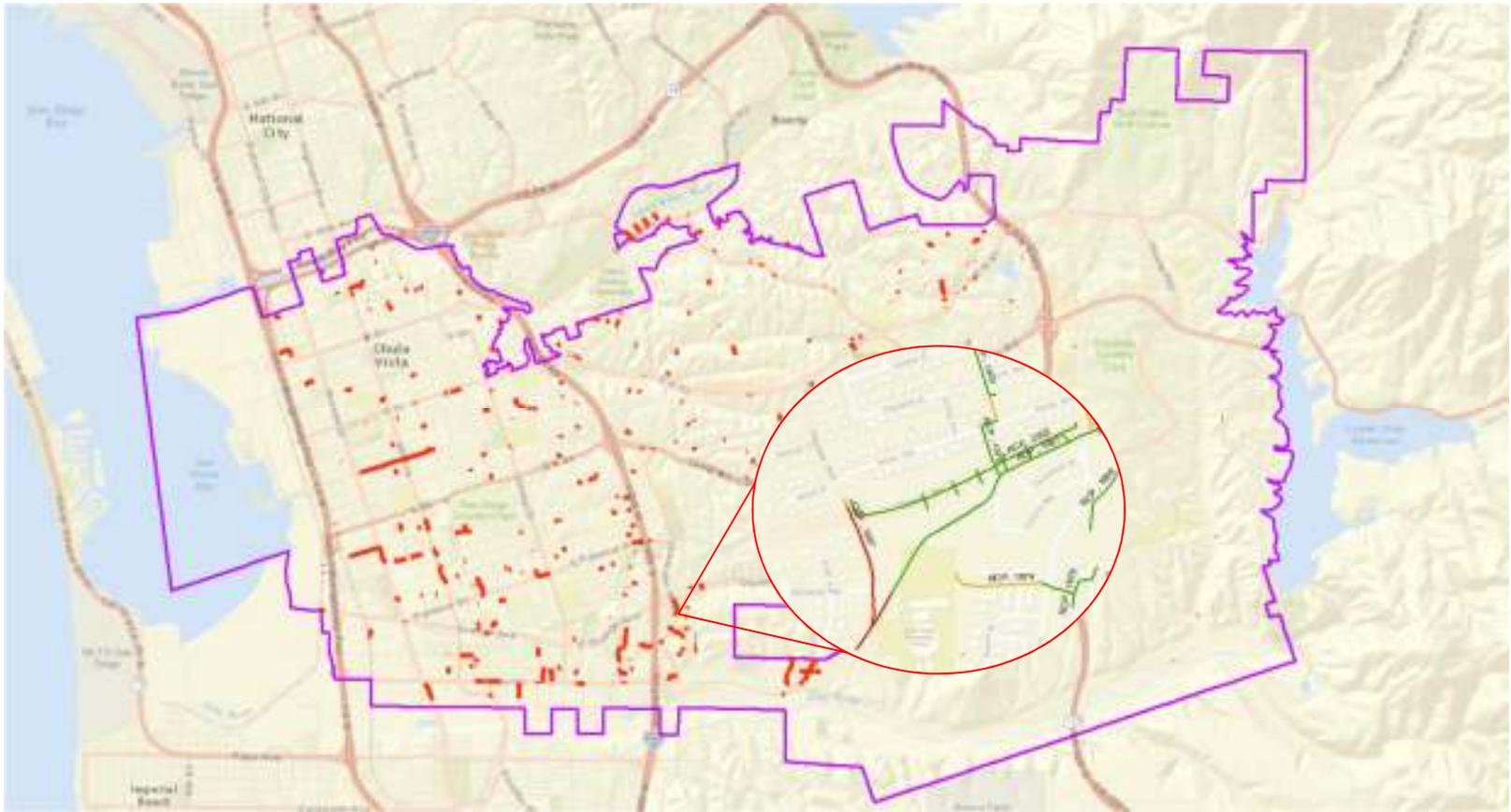


# Drainage Story

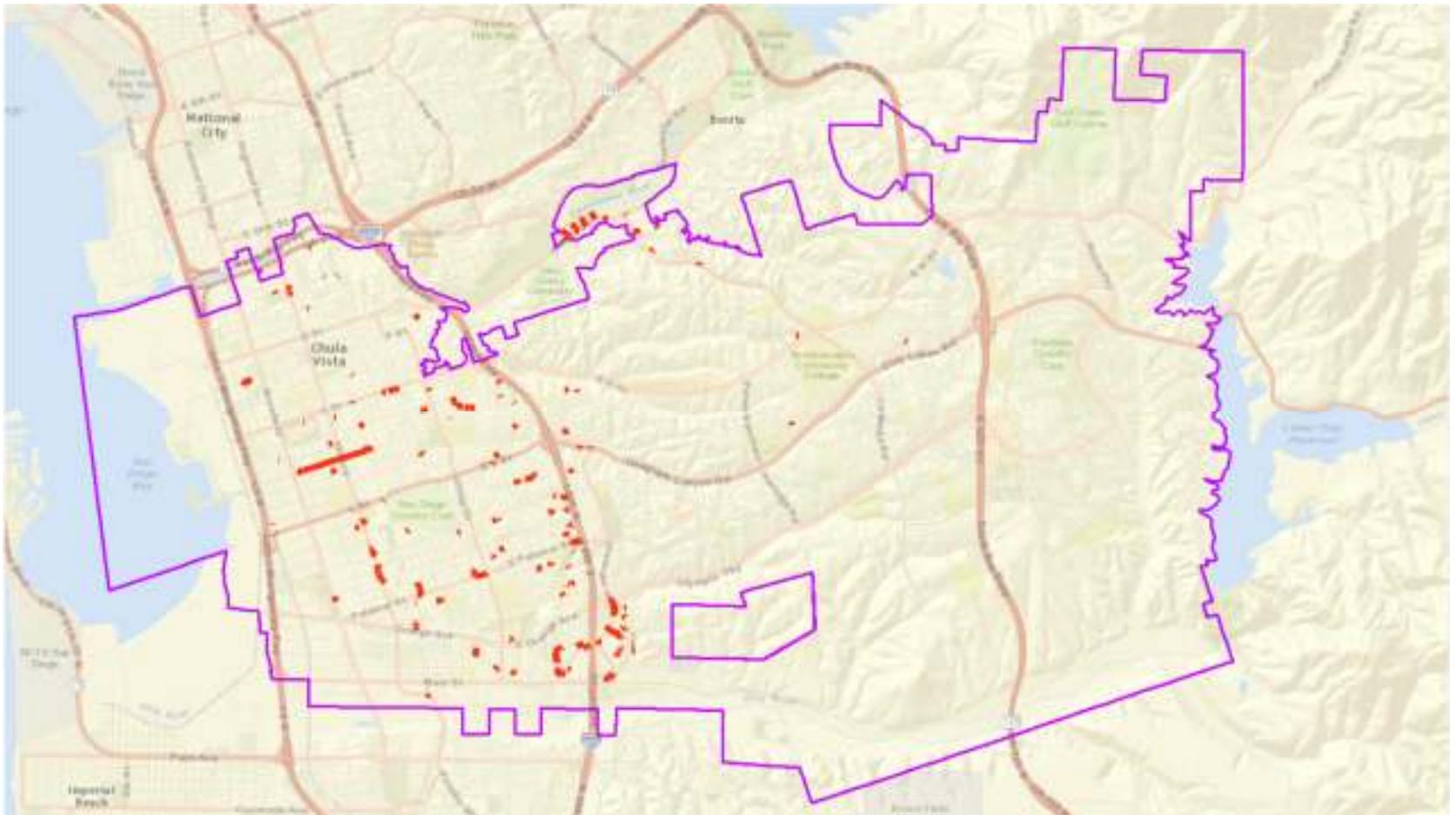
- ◆ Corrugated metal pipe failure
  - Installed in 1967



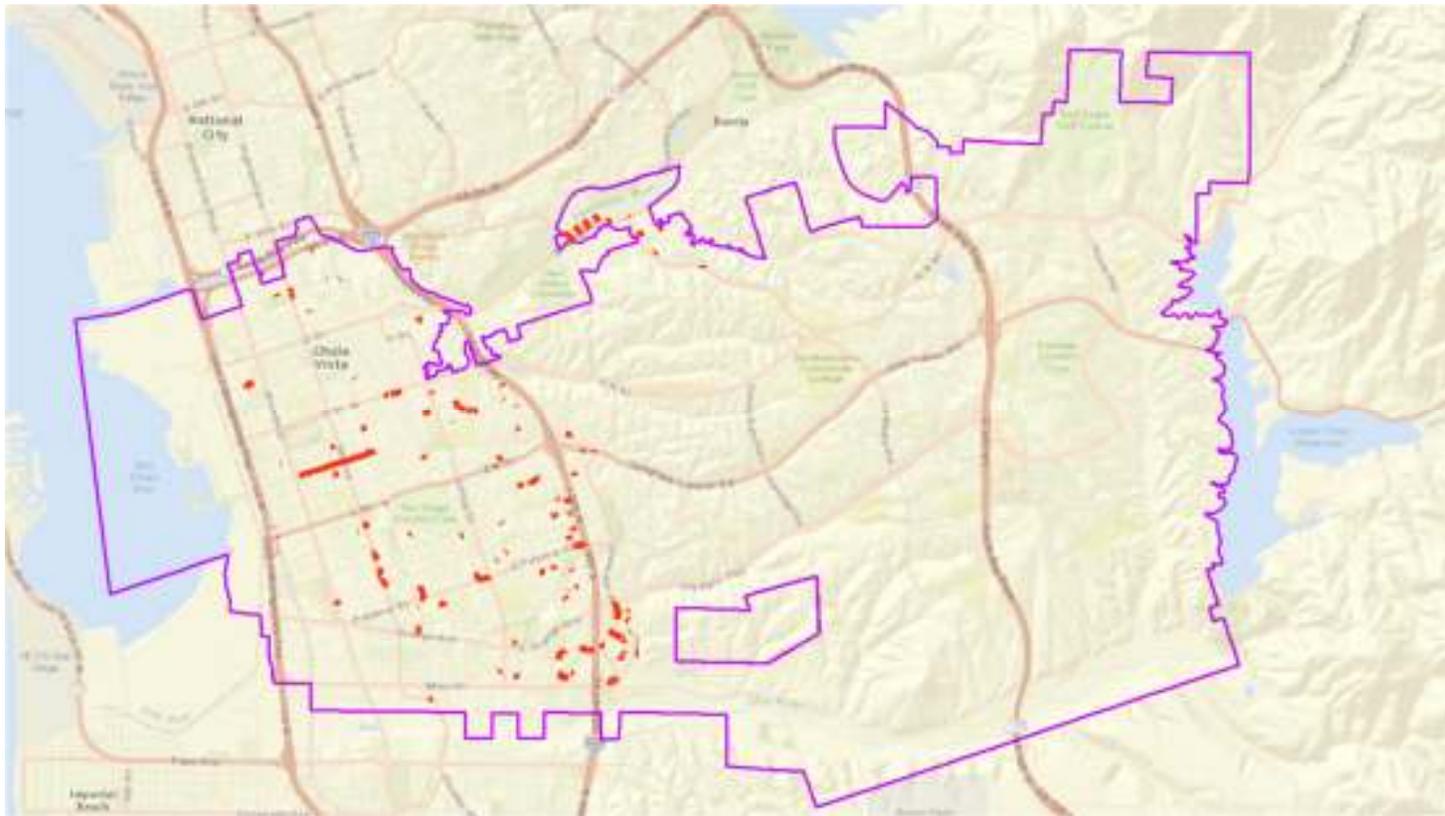
# All Corrugated Metal Pipes



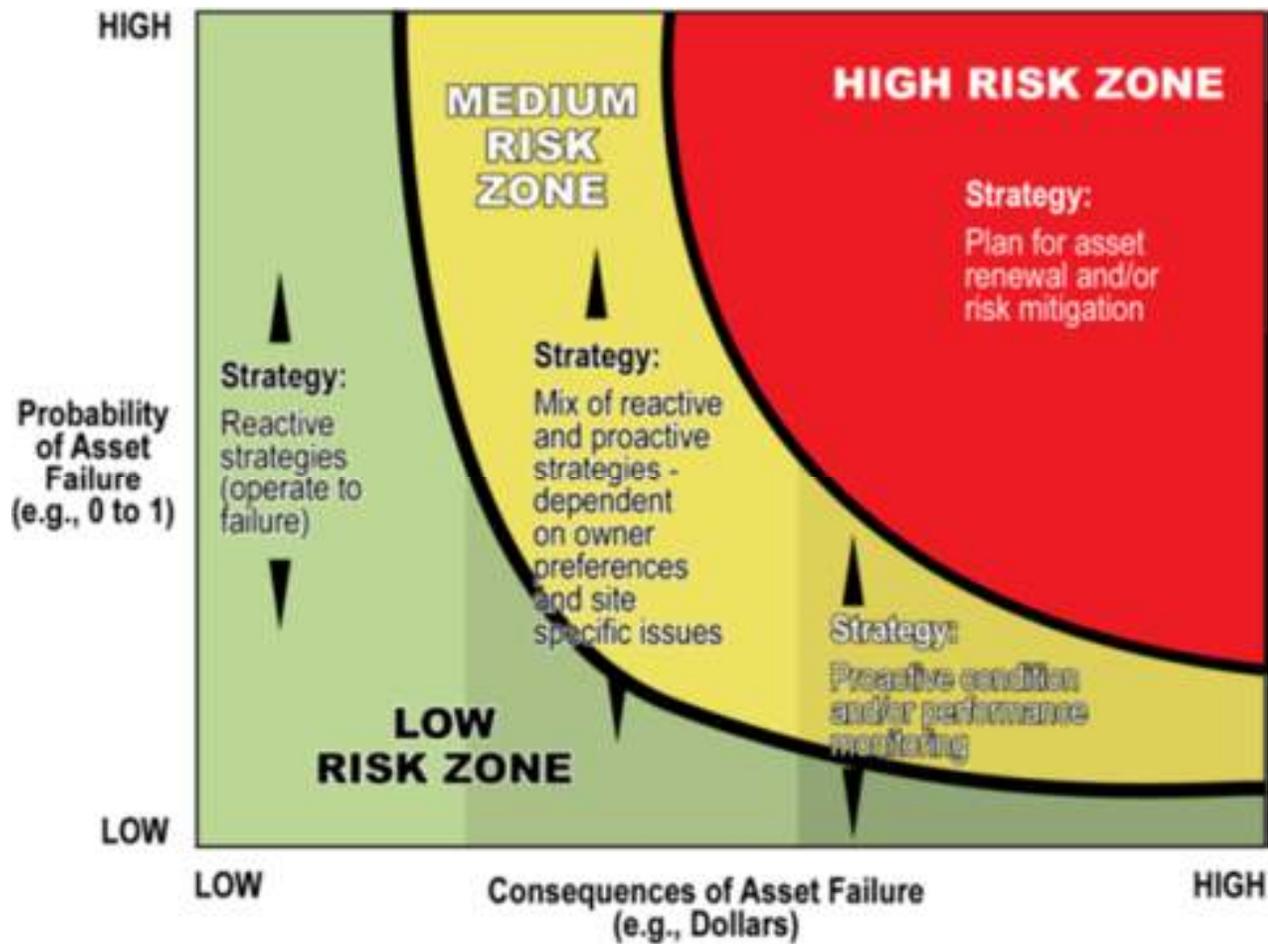
# Pre-1975 Corrugated Metal Pipe



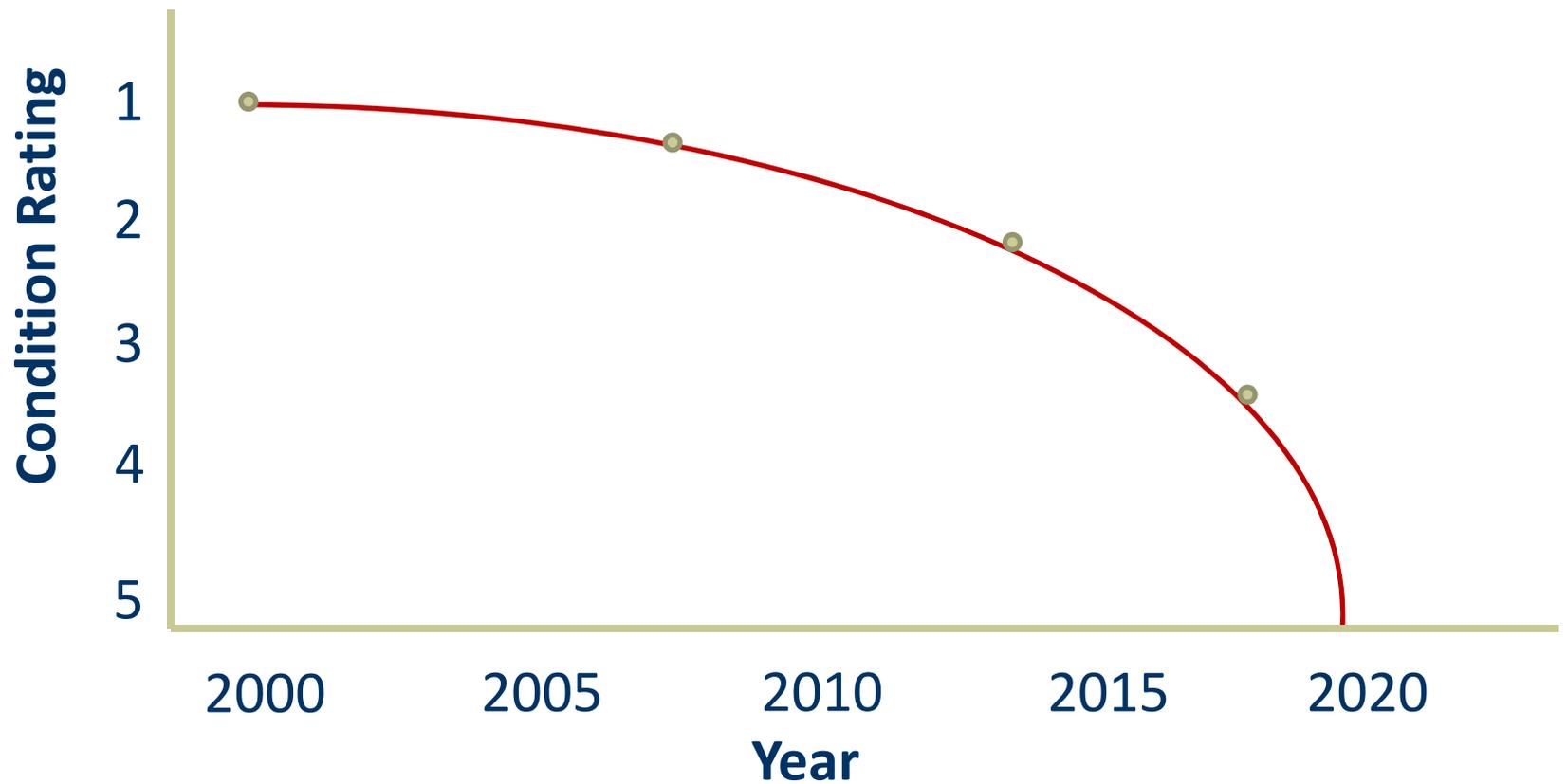
# CMP in High Risk Area



# Management Strategy (Risk-Based)



# Calculating the Timing to Failure



# Asset Life Cycle Investment Logic



# Valuation Adjustment Factors: Species

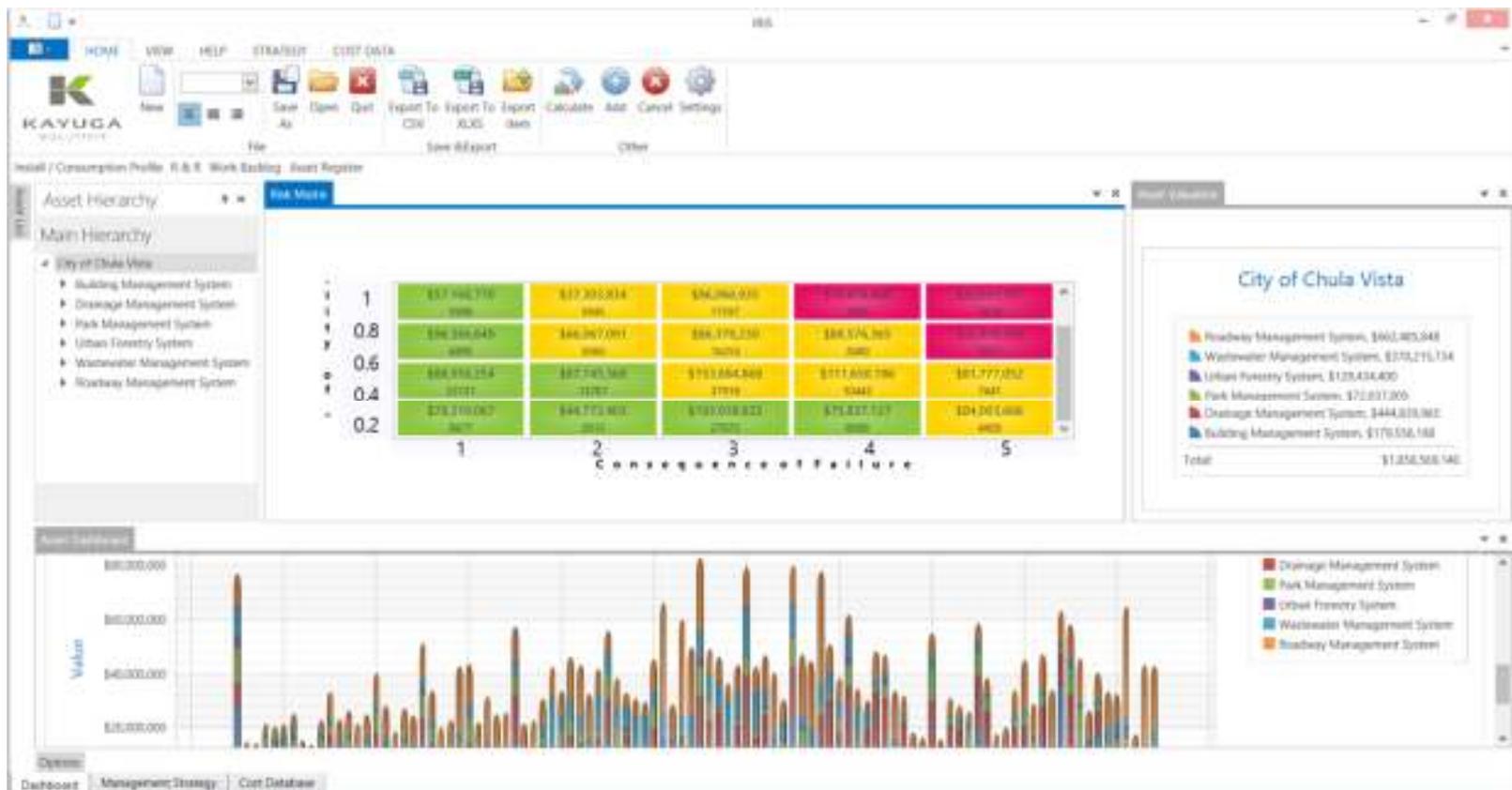
Species	Species Rating
OAK	1
PALM-DATES	1
CHITALPA	1
PEPPER	0.5
CAJEPUT	0.5
BERRY	0.5
BUSH	0.5
MYOPORUM	0.4

			
Oak	Palm – Dates	Chitalpa	Pepper
			
Cajeput	Berry	Bush	Myoporum

# Life Cycle Costing Logic

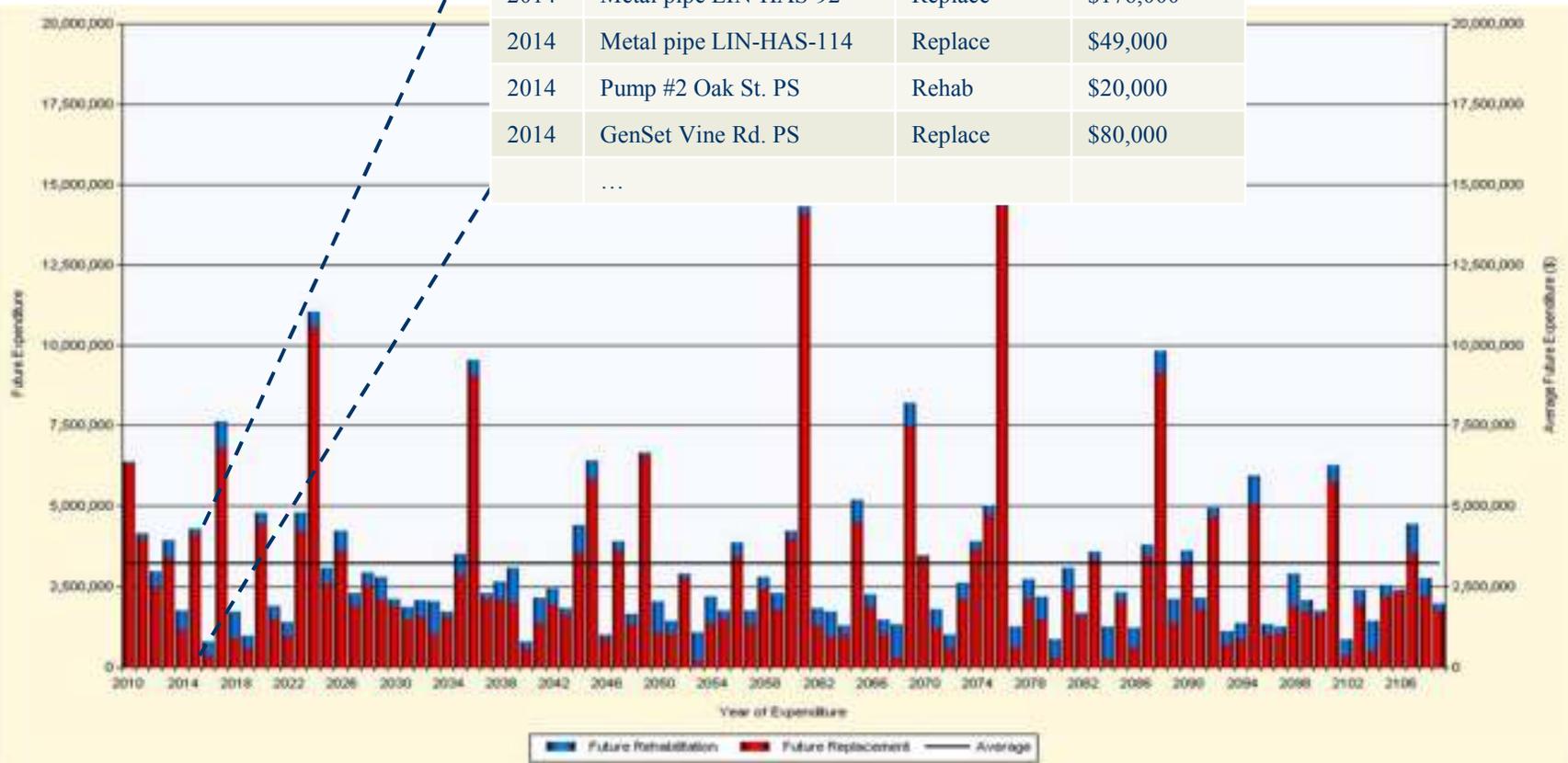
Tree Category	Life	Activity	Frequency	Cost
PALM-Queen-Parks	125	Trimming	1	\$20
PALM-Fan-Parks	125	Trimming	2	\$35
PALM-Dates-Parks	125	Trimming	2	\$150
EUCALYPTUS-Small-Parks	125	Trimming	3	\$55
EUCALYPTUS-Medium-Parks	125	Trimming	3	\$140
EUCALYPTUS-Large-Parks	125	Trimming	3	\$205
EUCALYPTUS-Mature-Parks	125	Trimming	3	\$325
PINE-Parks	125	Trimming	3	\$150
Broadleaf Tree-Parks	125	Trimming	3	\$75

# Asset Management Tool



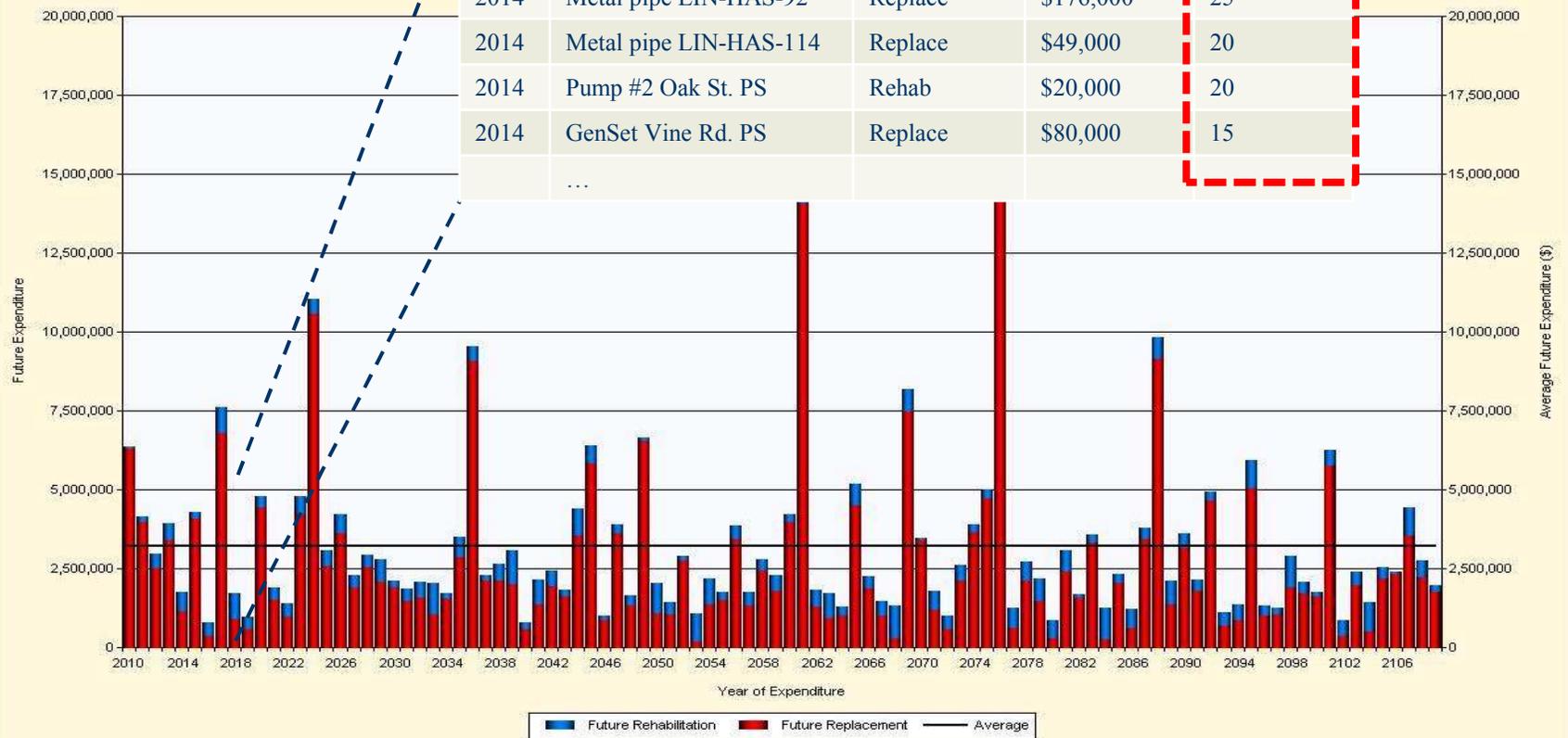
# Understanding the Need (Year By Year, Asset By Asset)

Year	Asset Name	Action Type	Action Cost
2014	Metal pipe LIN-HAS-78	Replace	\$340,000
2014	Metal pipe LIN-HAS-92	Replace	\$176,000
2014	Metal pipe LIN-HAS-114	Replace	\$49,000
2014	Pump #2 Oak St. PS	Rehab	\$20,000
2014	GenSet Vine Rd. PS	Replace	\$80,000
	...		

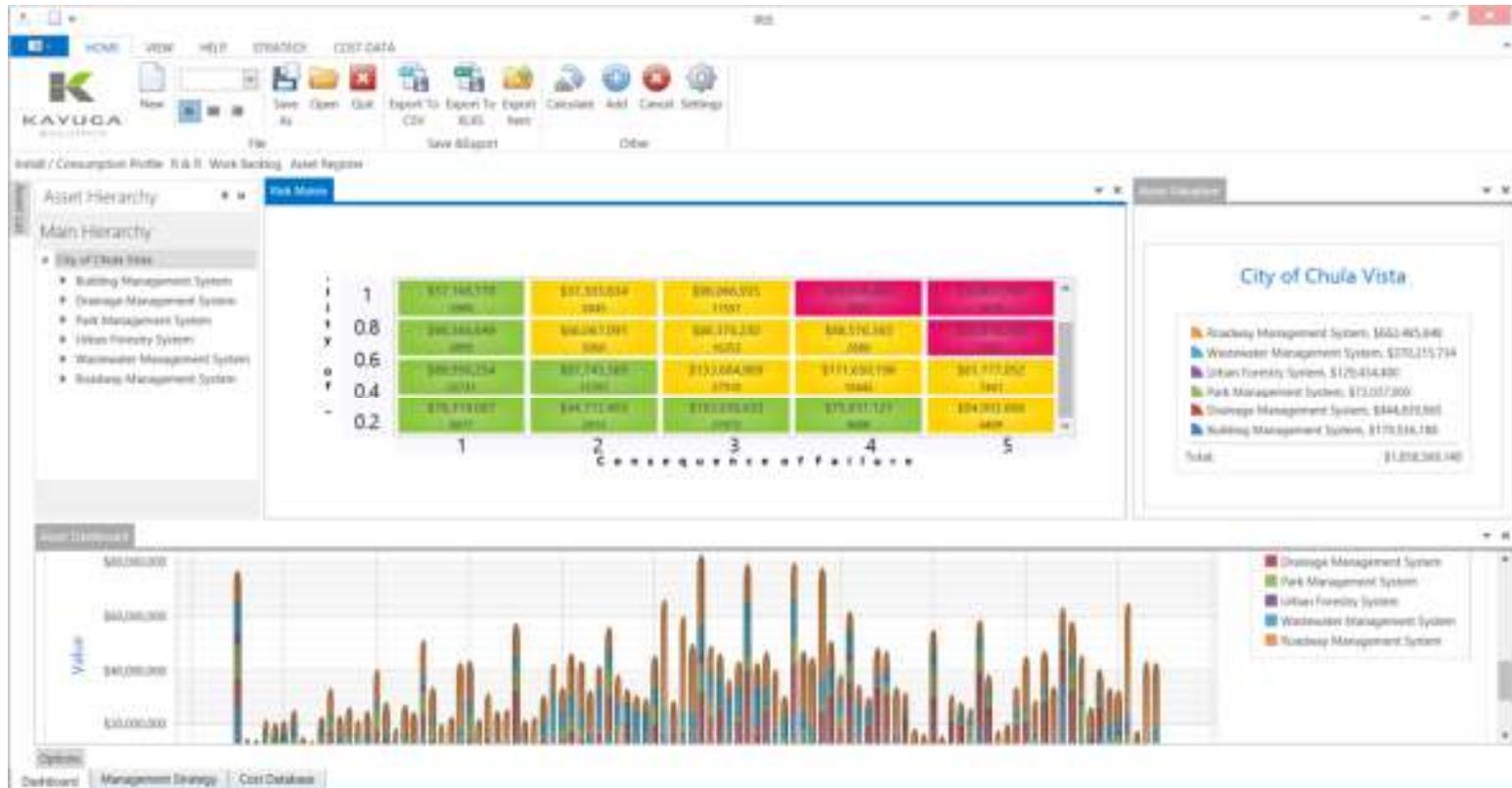


# Risk-Based Prioritization

Year	Asset Name	Action Type	Action Cost	Risk Score
2014	Metal pipe LIN-HAS-78	Replace	\$340,000	25
2014	Metal pipe LIN-HAS-92	Replace	\$176,000	25
2014	Metal pipe LIN-HAS-114	Replace	\$49,000	20
2014	Pump #2 Oak St. PS	Rehab	\$20,000	20
2014	GenSet Vine Rd. PS	Replace	\$80,000	15
...	...	...	...	...



# Asset Management Tool Demonstration



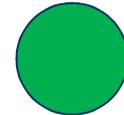
# Wastewater Management System (WMS)



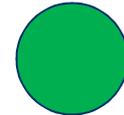
AMPAC Tour of South Bay Water Reclamation Plant

# WMS Process Assessment

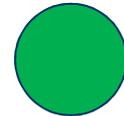
Asset Inventory



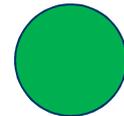
Condition Assessment



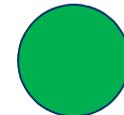
Risk Assessment



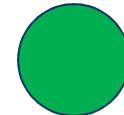
Lifecycle Costing



Catching Up



Keeping Up

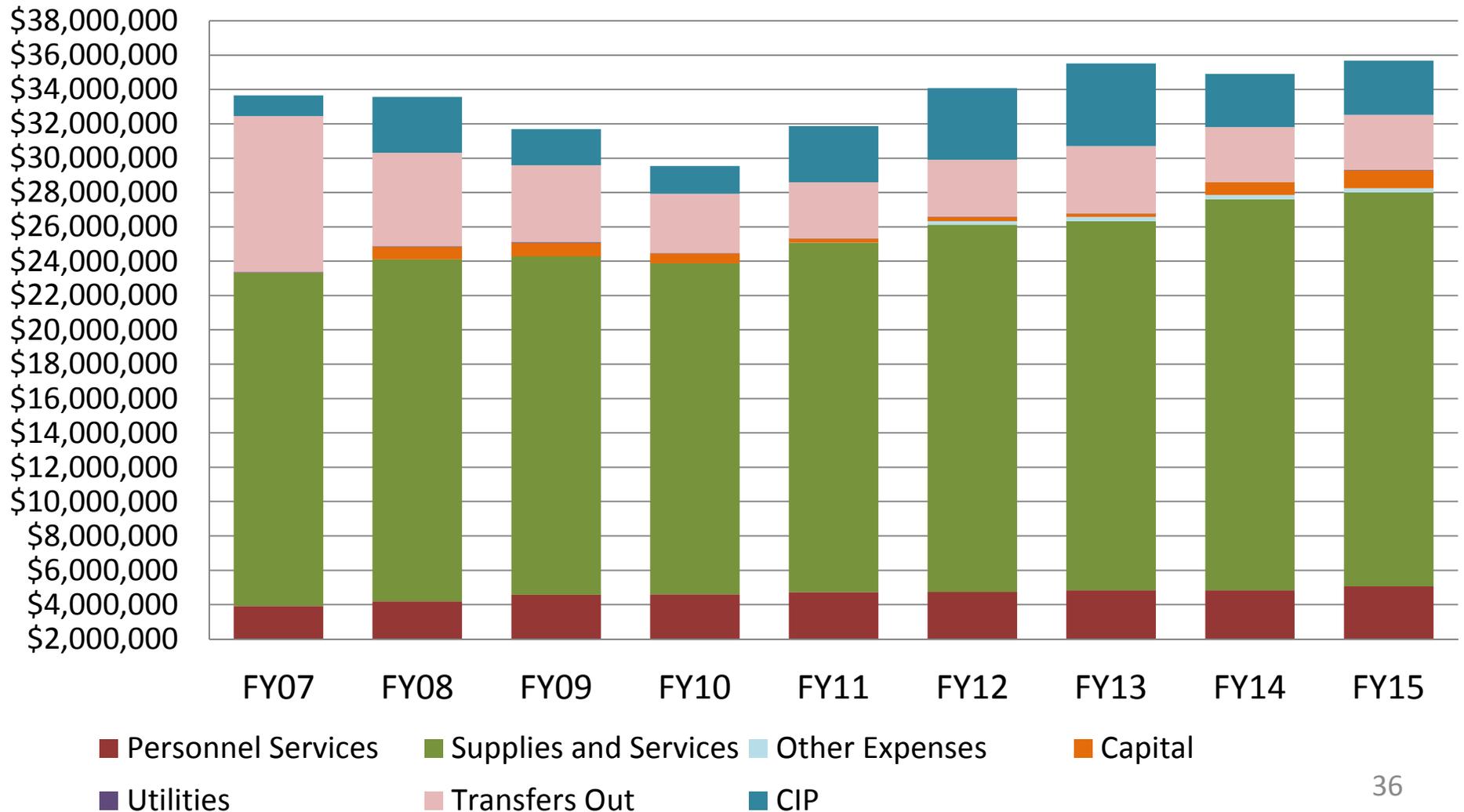


Moving Forward



# Wastewater Management System (WMS)

Annual Funding for Wastewater Maintenance and Repair

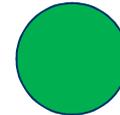


# Drainage Management System (DMS)

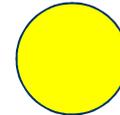


# DMS Process Assessment

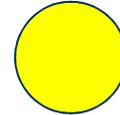
Asset Inventory



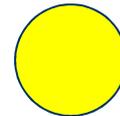
Condition Assessment



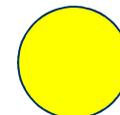
Risk Assessment



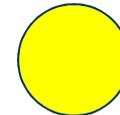
Lifecycle Costing



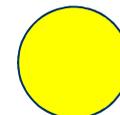
Catching Up



Keeping Up

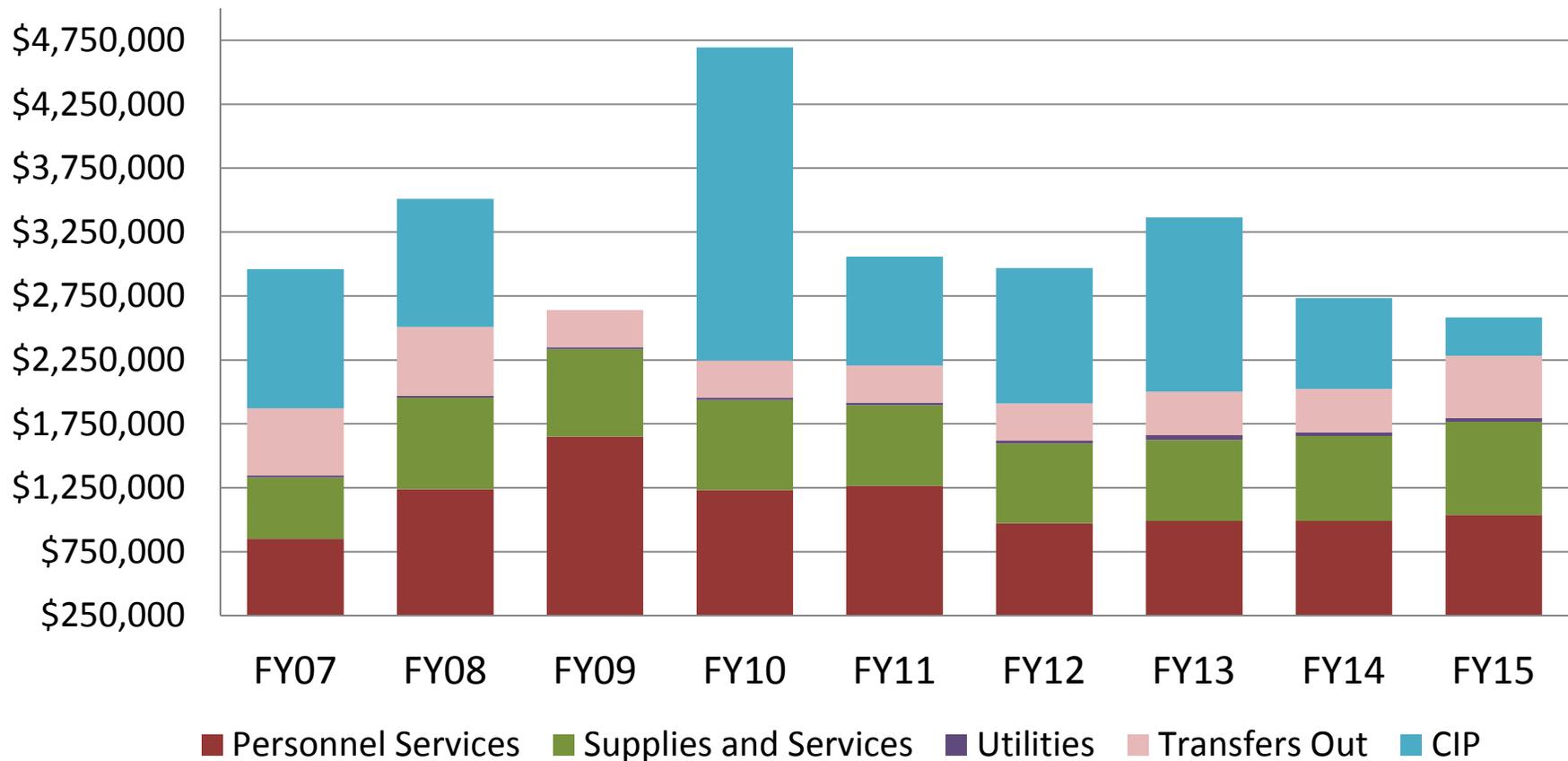


Moving Forward



# Drainage Management System (DMS)

Annual Funding for Drainage and Maintenance and Repair



# DMS

## How do we spend today?

### **Service Requests:**

Manhole open

Debris removal

Litter abatement

### **Routine Maintenance:**

Annual Inspection

Weed abatement

Sediment removal

Invasive species removal

### **Restoration: CIP**

CMP lining/replacement

RCP lining/replacement

PCC cross gutter reconstruction

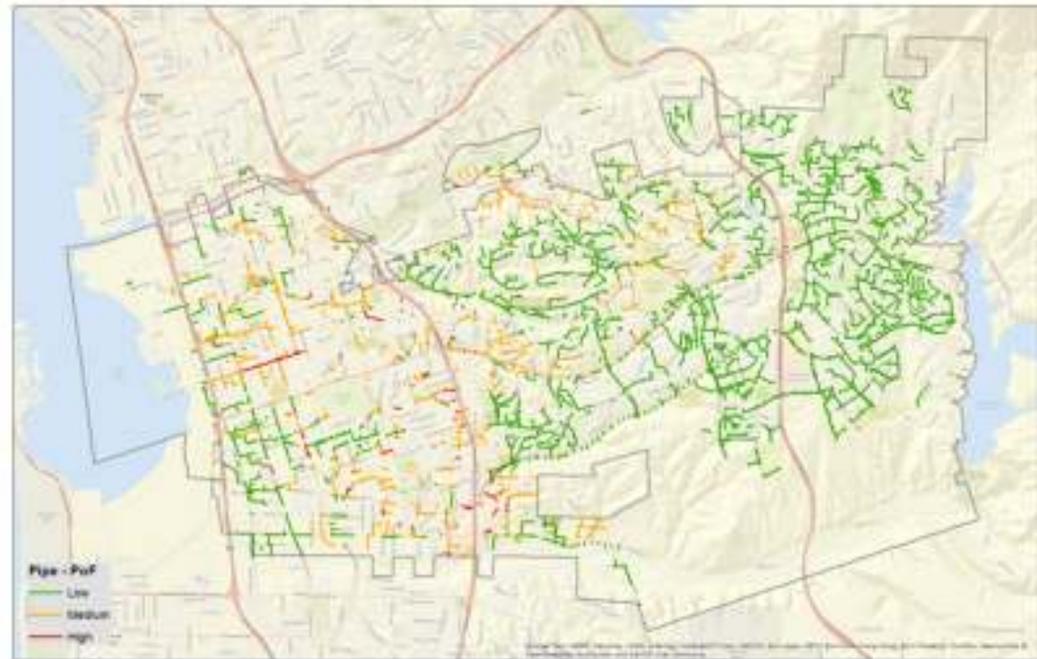
PCC ADA access ramps

PCC Culvert restoration

Natural Lined Channels

# DMS

- 2014 Estimated Deferred Maintenance (non CFD areas) - \$80 Million (Replacement of Drainage Facilities, CMP, Canyon/Channel Erosion, etc.)

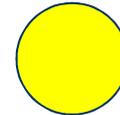


# Roadway Management System (RMS)

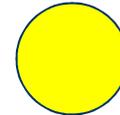


# RMS Process Assessment

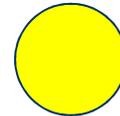
Asset Inventory



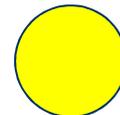
Condition Assessment



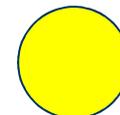
Risk Assessment



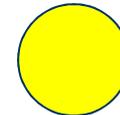
Lifecycle Costing



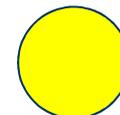
Catching Up



Keeping Up

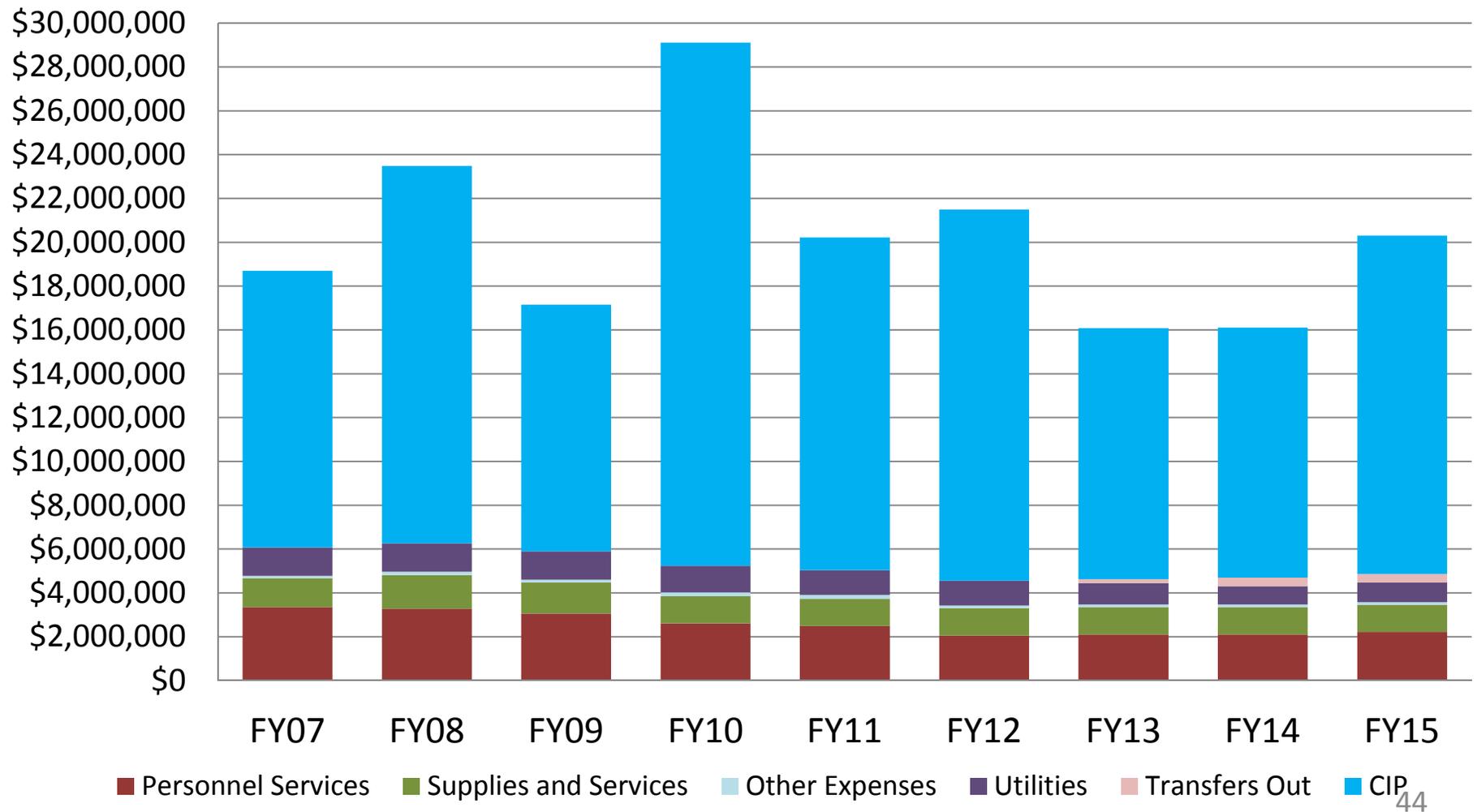


Moving Forward

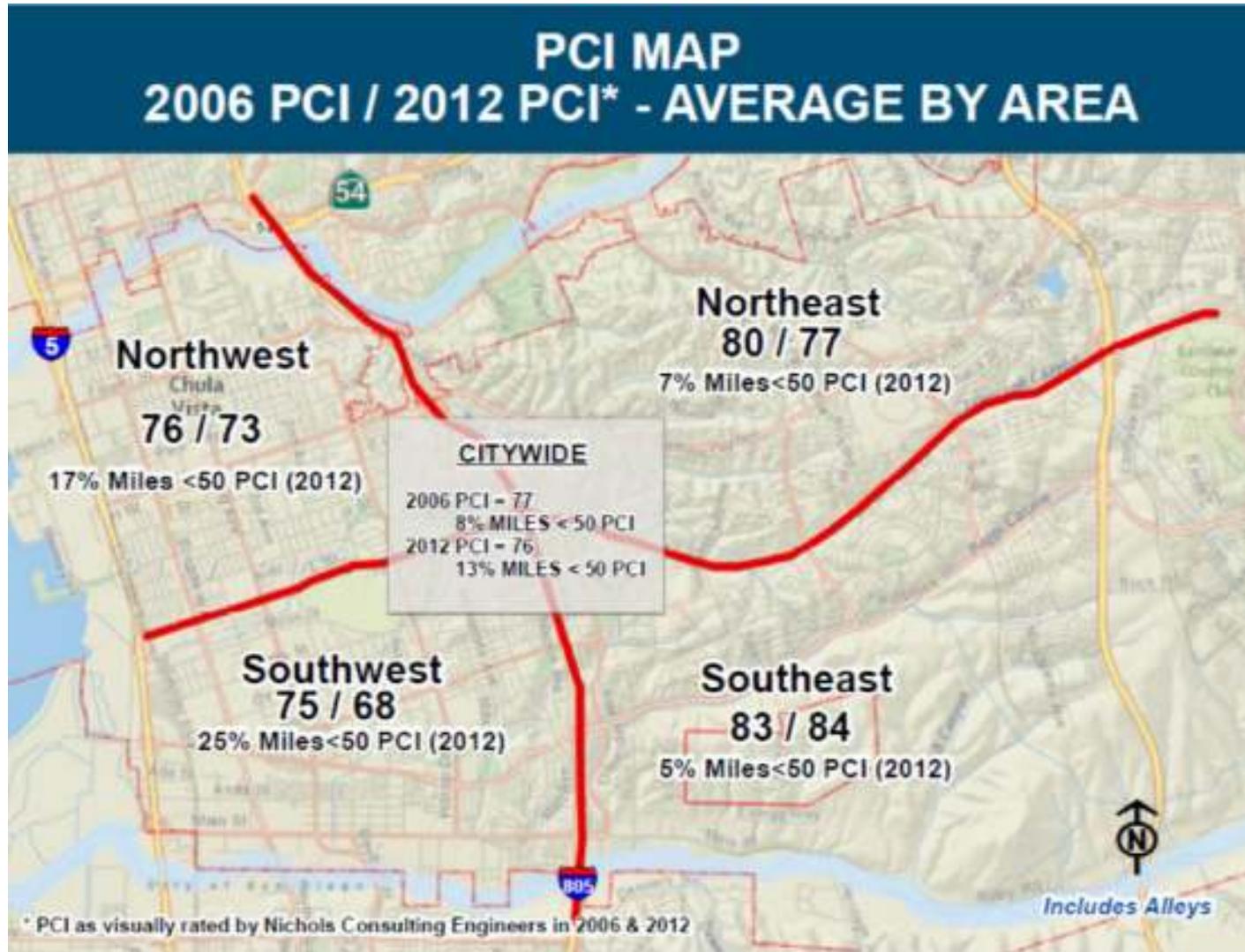


# Roadway Management System (RMS)

## Annual Funding for Roadway Maintenance and Repairs



# Pavement Condition



# RMS

## How do we spend today?

### **Service Requests:**

- Pothole repair
- Debris removal
- Litter abatement
- Graffiti abatement
- Fence/Guardrail repair

### **Routine Maintenance:**

- Street sweeping
- Weed abatement
- Faulted sidewalk abatement
- Crack Filling
- Repaint Curbs
- Repaint traffic stripes and
- Pavement markings

### **Restoration: CIP**

- AC seal coats
- AC overlay
- AC rind and replace
- AC reconstruct
- AC Full depth reclamation
- PCC sidewalk reconstruction
- PCC cross gutter reconstruction
- PCC Curb and gutter reconstruction
- PCC ADA access ramps
- Guardrail replace
- Fence replace
- Traffic signal/street light replacement

# RMS

## How do we spend today?



# RMS

- 2014 Estimated Deferred Maintenance
  - \$467 Million (Replacement of Sidewalk, Curb/Gutter, Pavement, Bikeway, Pedestrian, Traffic Signals, Street Lighting, Bridges, etc.)

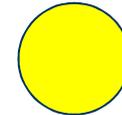


# Urban Forestry Management System (UFMS)

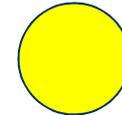


# UFMS Process Assessment

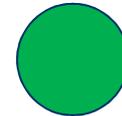
Asset Inventory



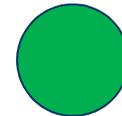
Condition Assessment



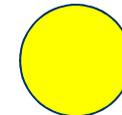
Risk Assessment



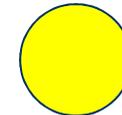
Lifecycle Costing



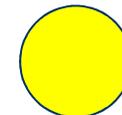
Catching Up



Keeping Up

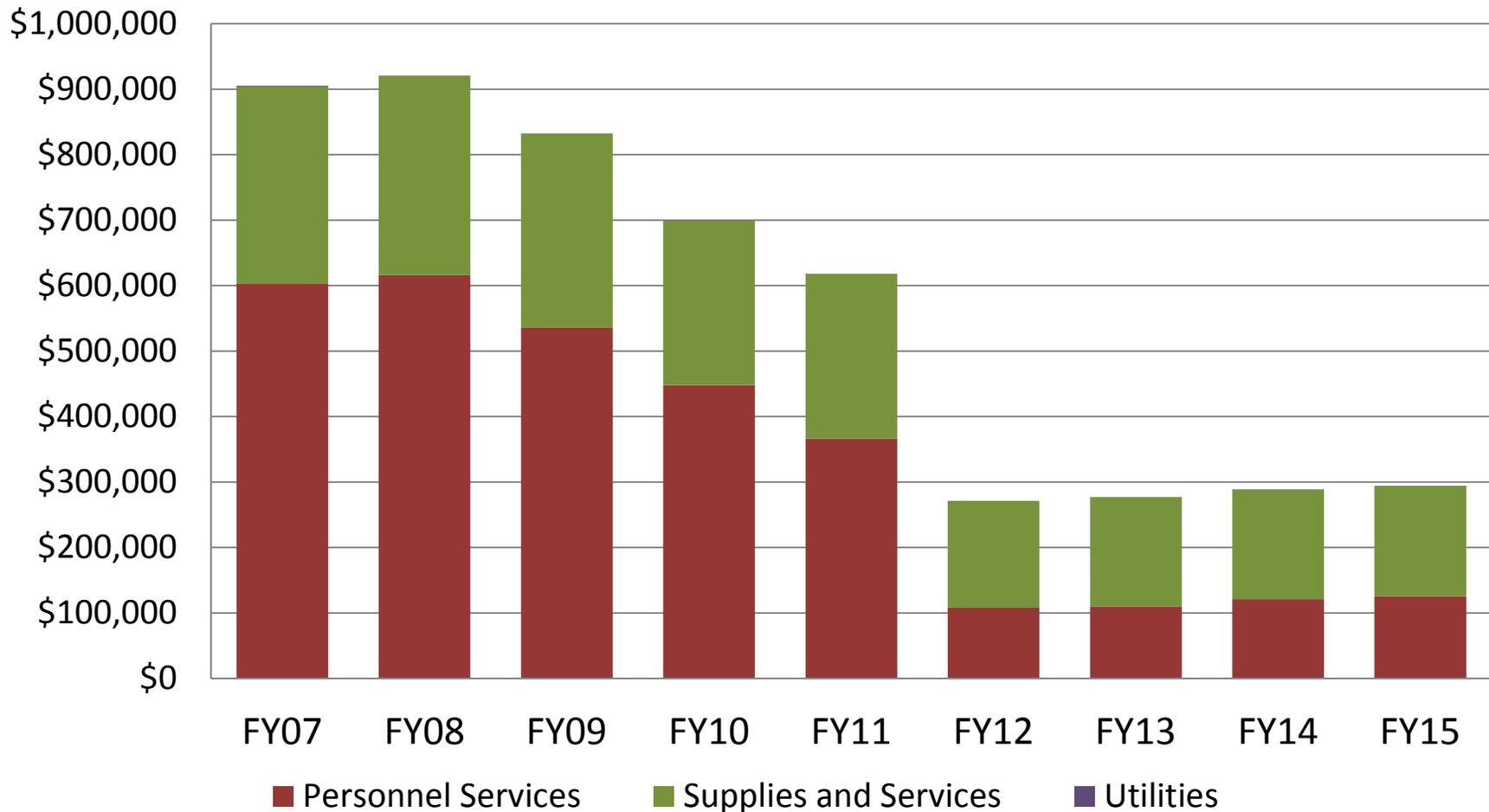


Moving Forward



# Urban Forestry Management System (UFMS)

Annual Funding for Urban Forestry Maintenance and Repair



# UFMS

- What is the nature of the backlog?
- \$1.6M Backlog
  - Includes
    - Trimming Cost
    - Removal Cost
    - Replacement Cost
- Highest Risk
  - Dead/Diseased Trees (227 trees)
  - Most critical (176 – parks) → Estimated \$75,000

# Parks Management System (PMS)

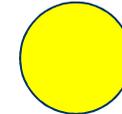


# PMS Process Assessment

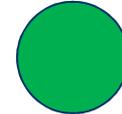
Asset Inventory



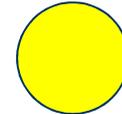
Condition Assessment



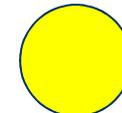
Risk Assessment



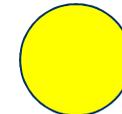
Lifecycle Costing



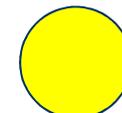
Catching Up



Keeping Up

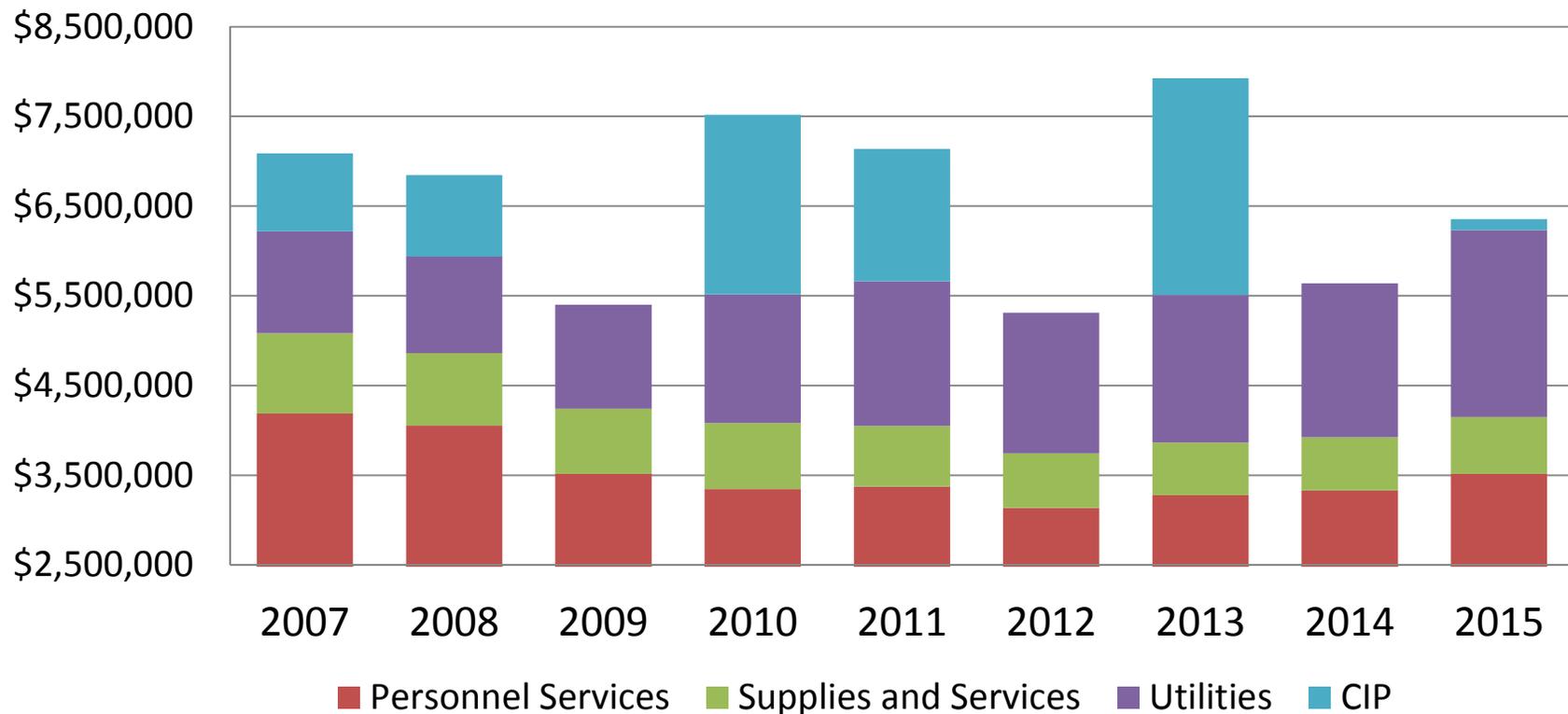


Moving Forward



# Park Management System (PMS)

## Annual Funding for Parks Maintenance and Repair



# PMS

## How do we spend today?

### **Routine Maintenance:**

- Mow and edge turf
- Clean and stock restrooms
- Pull/replace trash liners
- Pull weeds (planted areas)
- Litter abatement

### **Periodic Maintenance:**

- Fertilize/Herbicide/Aerate turf areas
- Graffiti abatement
- Fertilize/Herbicide/Mulch (planted areas)
- Check and repair irrigation systems
- Check and repair tot lot equipment and soft fall
- Trim trees
- Check and repair walking paths and trails
- Restore surfacing on tennis and basketball courts
- Check and repair hoops, backboards and nets
- Repaint various park elements (gazebos, benches, tot lot equipment, etc.)
- Restripe parking lots
- Renovate sports fields (reseed/rest)

### **Restoration: CIP**

- Replace tennis and basketball courts
- Replace gazebos
- Replace tot lot equipment and surfacing/soft fall
- Replace trash receptacle
- Replace BBQ
- Replace benches and tables
- Resurface parking lots
- Replace signage
- Replace broken concrete (sidewalks, trash pads, picnic pads, etc.)

# PMS

- 2014 - Estimated Deferred Maintenance  
\$20 Million (Replacement/ Renovation of Fields, Playgrounds, Restrooms, Shelters, etc.)

P r o b a b i l i t y  o f  F a i l u r e	1	\$132,195 71	\$8,262,723 1955	\$1,483,710 336	\$1,082,428 30	\$4,190,368 753
	0.8	\$91,000 18	\$2,501,609 387	\$967,160 104	\$183,120 11	\$4,881,371 481
	0.6	\$222,870 50	\$5,050,074 752	\$2,121,635 181	\$571,400 51	\$10,455,187 666
	0.4	\$54,000 25	\$3,346,818 373	\$1,457,085 67	\$290,195 31	\$6,001,380 482
	0.2	\$45,300 8	\$2,944,606 117	\$1,365,025 31	\$234,180 16	\$3,537,815 188
		1	2	3	4	5
		C o n s e q u e n c e o f F a i l u r e				

# Fleet Management System (FMS)



AMPAC Review of Police and Fire vehicles and facilities

# FMS Process Assessment

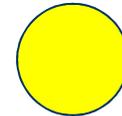
Asset Inventory



Condition Assessment



Risk Assessment



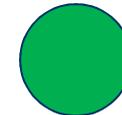
Lifecycle Costing



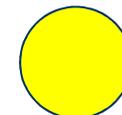
Catching Up



Keeping Up

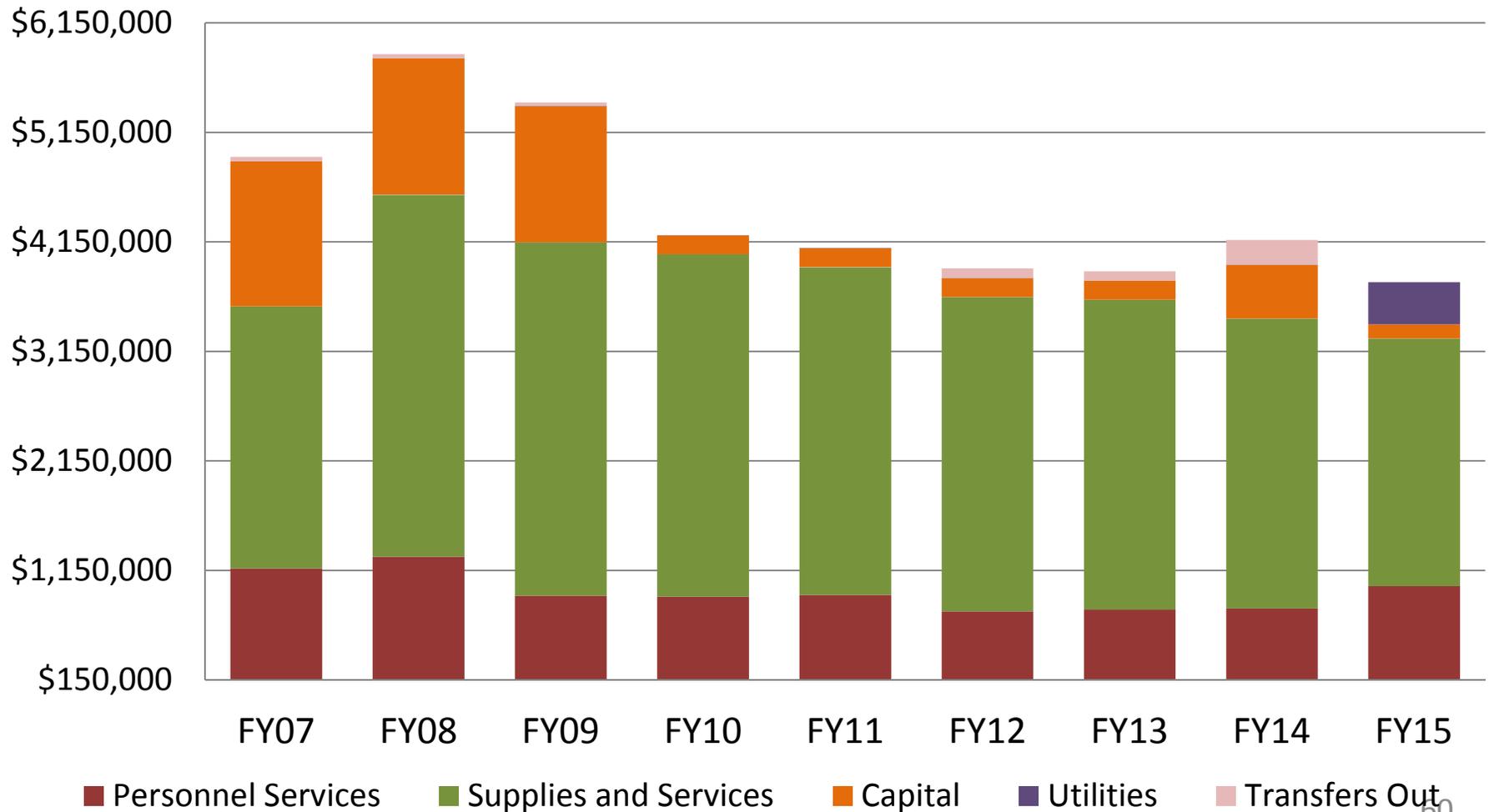


Moving Forward

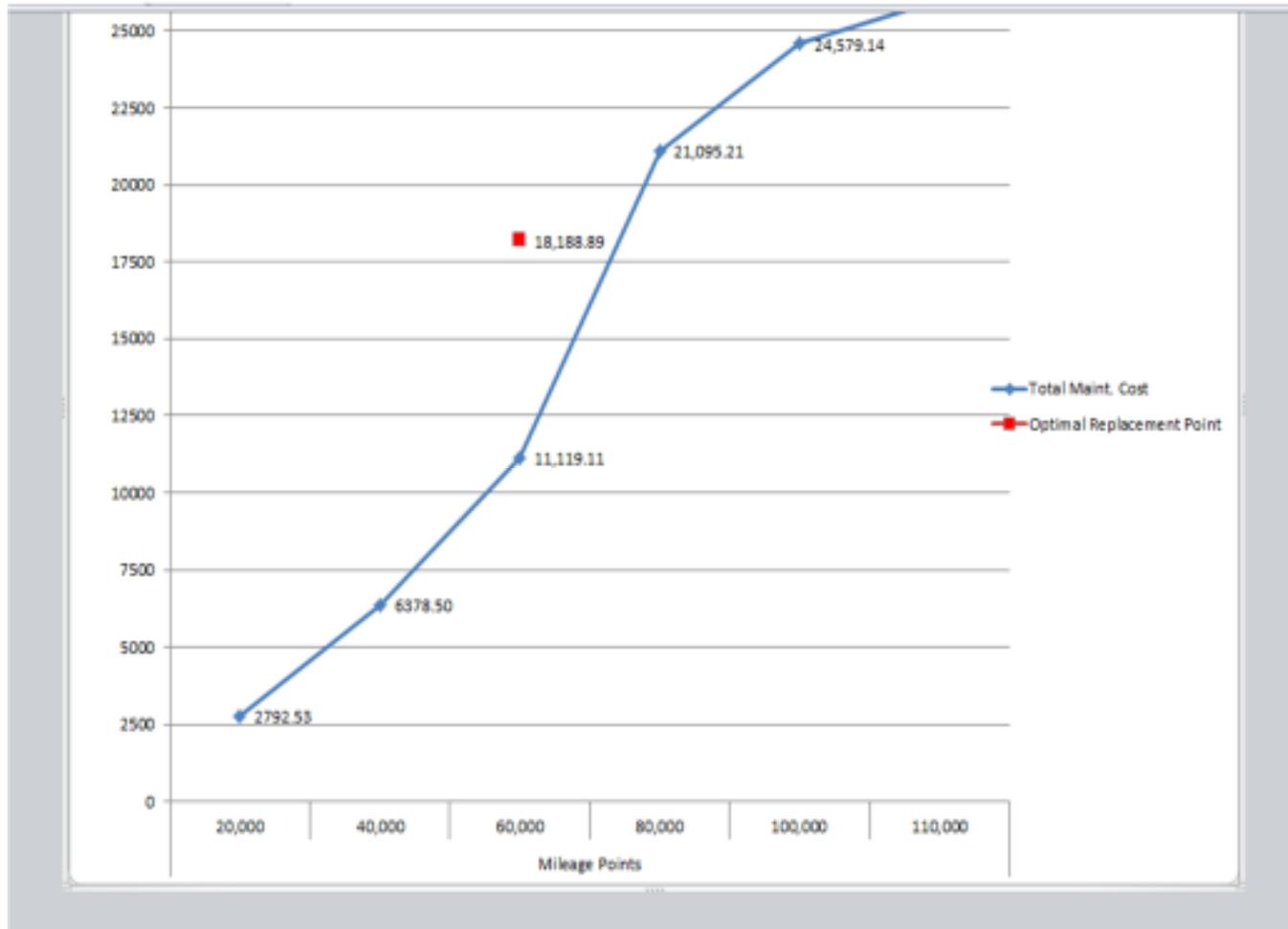


# Fleet Management System (FMS)

## Fleet



# Lost Cost Avoidance



# VEHICLE REPLACEMENT

FISCAL YEAR	NON-SAFETY VEHICLES <sup>(1) (2)</sup>	PATROL CARS <sup>(2)</sup>
2014-15	0 of 0	13 of 13
2013-14	8 of 8 <sup>(3)</sup>	0 of 0 <sup>(4)</sup>
2012-13	5 of 5 <sup>(3)</sup>	7 of 7 <sup>(4)</sup>
2011-12	0 of 24 <sup>(3)</sup>	0 of 6 <sup>(4)</sup>
2010-11	0 of 19 <sup>(3)</sup>	10 of 10 <sup>(4)</sup>
2009-10	0 of 12 <sup>(3)</sup>	14 of 19 <sup>(4)</sup>
2008-09	0 of 10 <sup>(3)</sup>	10 of 19 <sup>(4)</sup>
(1) Excludes Sewer funded vehicles.		
(2) No. of vehicles scheduled to be replaced.		
(3) Reflects extended replacement intervals.		
(4) Replaced at 100,000 miles vs. 80,000 miles.		

# FMS

## How do we spend today?

### **Service Requests:**

Mechanical Failure  
Damage  
Body work

**Restoration: CIP**  
Replacement

### **Routine Maintenance:**

PM's

# FMS

- \$2.3 M

	<b>Department</b>	<b># of Vehicles</b>	<b>Replacement Amount</b>
	Animal Care Services	2	\$150,000
	Community Patrol	17	\$1,054,000
	Traffic Enforcement	1	\$34,000
	Fire Administration	2	\$120,000
	Fire Suppression	2	\$120,000
	Public Works	9	\$747,000
	Emergency Vehicle Purchases		\$70,000
	<b>TOTAL</b>		<hr/> <b>\$2,295,000</b>

# Building Management System (BMS)



# AMPAC Tour of Fire Station #1

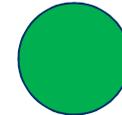


# BMS Process Assessment

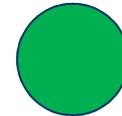
Asset Inventory



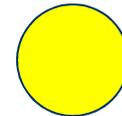
Condition Assessment



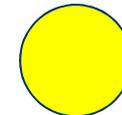
Risk Assessment



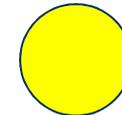
Lifecycle Costing



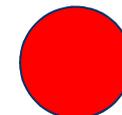
Catching Up



Keeping Up

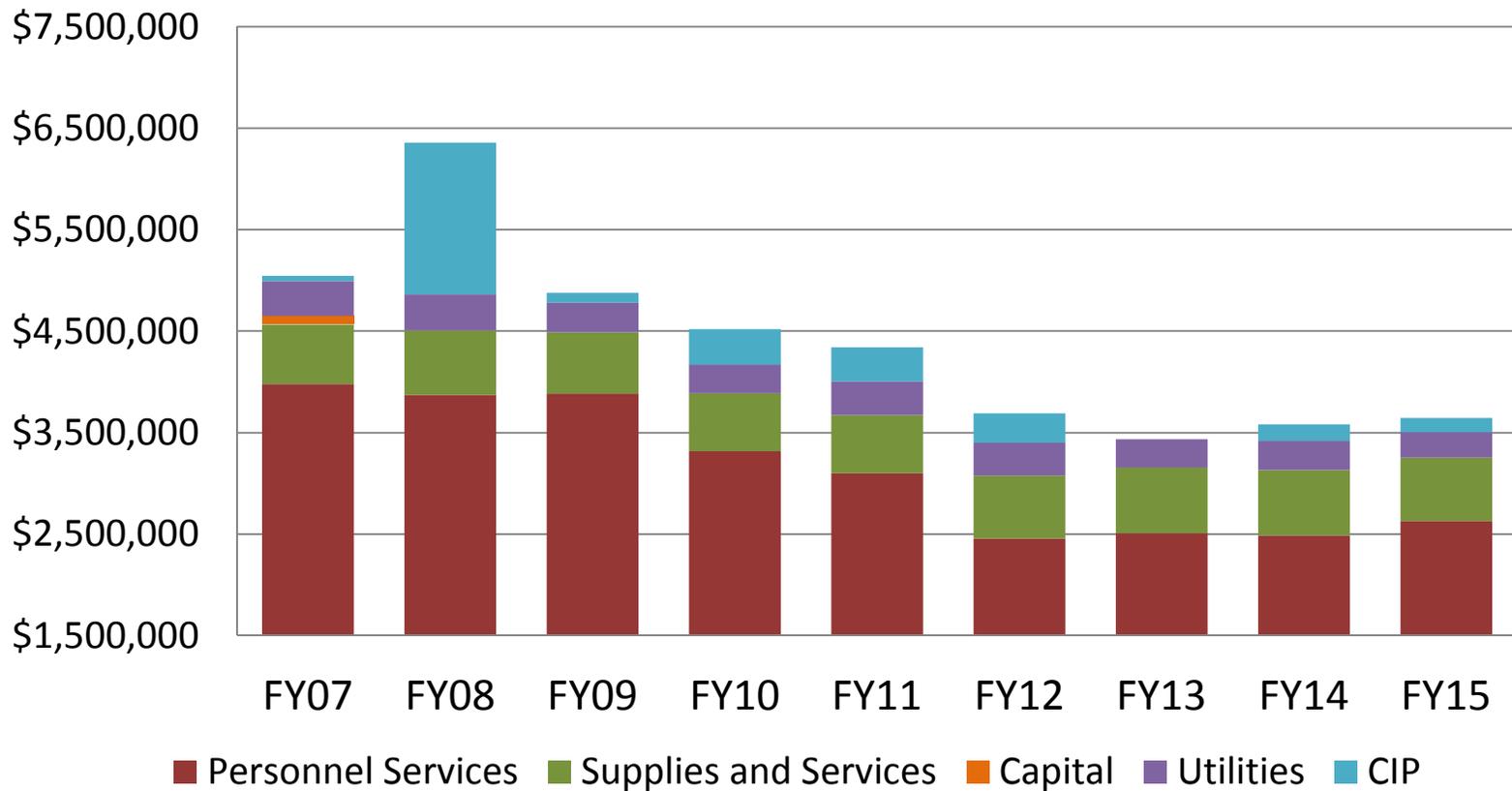


Moving Forward



# Building Management System (BMS)

**Annual Funding for Building Maintenance and Repairs**



# BMS

## How do we spend today?

### **Routine Maintenance:**

- Light bulb replacement
- Plumbing fixture repair
- Door locks/keys
- Radio repairs
- Replace wires (theft)
- Recharge HVAC

### **Restoration: CIP**

- HVAC Replacement
- ADA Compliance
- Roof Replacement
- Exterior/interior paint

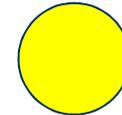
# BMS

- 2014 Estimated Deferred Maintenance of Buildings & Facilities
  - \$60 Million (Replacement of Roofing, HVAC, Plumbing, Electrical Systems, etc.)

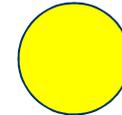


# OSMS Process Assessment

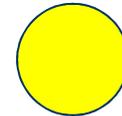
Asset Inventory



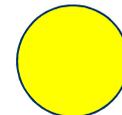
Condition Assessment



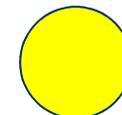
Risk Assessment



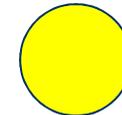
Lifecycle Costing



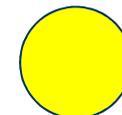
Catching Up



Keeping Up

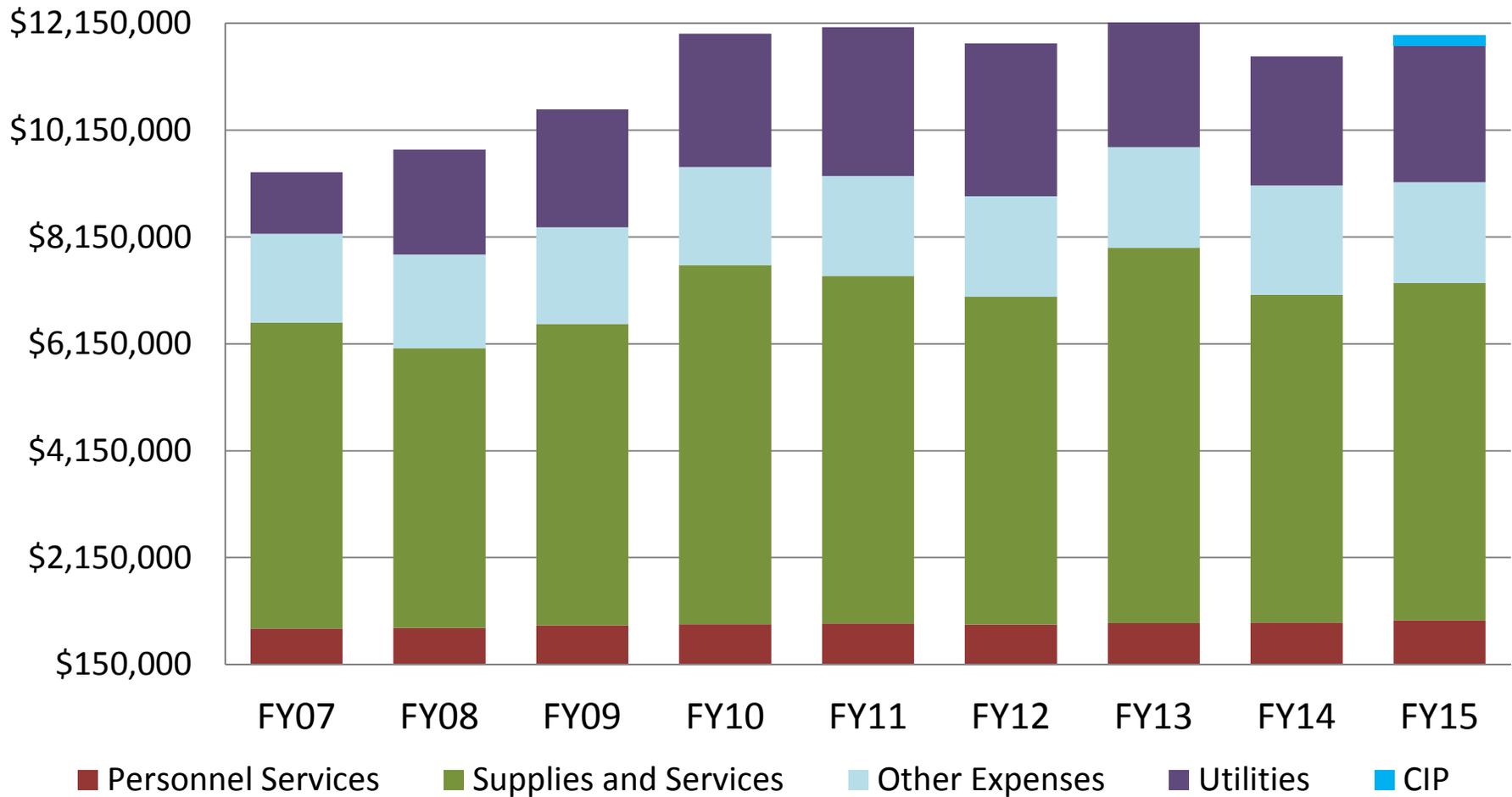


Moving Forward



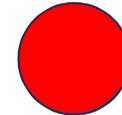
# Open Space Management System (OSMS)

Open Space

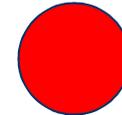


# GGMS Process Assessment

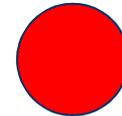
Asset Inventory



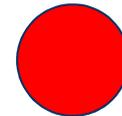
Condition Assessment



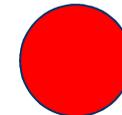
Risk Assessment



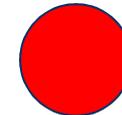
Lifecycle Costing



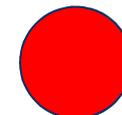
Catching Up



Keeping Up



Moving Forward





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## Chula Vista's Asset Management Journey Continues

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- Austere times continue-no relief in 5 year forecast
- Staff is working smarter (CI) to keep services in place
- Continue to consume useful life of our assets
- Quantifying funding needs to sustain levels of service
- Confront risks & prioritizing probabilities
- Seek input from the community (LOS and \$)
- Update Budgets to reflect expectations



# CURRENT FUNDING SOURCES

- *General Fund (Property and Sales Tax)*
- *Assessment Districts*
- *Grants (Federal/State/Local/Private)*
- *Fees (users)*
- *Gas Excise Tax (State/Federal)*
- *Local Sales Tax*

The City's infrastructure need is

**Significant**  
Overwhelming  
**Substantial**  
Moderate Large  
**Challenging**  
**Urgent**

The asset inventory process that evaluates the City's infrastructure need is

70

60

50

40

30

20

10

0

Acceptable  
Respected  
Impressive  
Transparent  
Effective  
Credible  
Realistic



# The City's asset management approach is

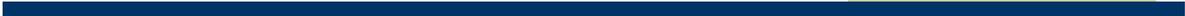
**Needed**  
**Sound**  
**Transparent**  
**Factual**  
**Valid**  
Proactive  
Equitable  
Imperfect  
Professional  
Late

# AMPAC





# What's Next?



- ◆ Continue Inventory
- ◆ Continued AMPAC meetings
- ◆ Citizen outreach on Infrastructure needs



# Questions or topics for future AMPAC meetings

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- ◆ How to select which projects get done first
- ◆ Citizen's perception of wants vs. needs & priorities
- ◆ Layout the priorities for the next 5 years and projected costs.
- ◆ Cost reduction in areas of high cost
- ◆ History of claims against the city
- ◆ Funding strategies
- ◆ Thoughts and ideas around pursuing additional funds to close the infrastructure gap
- ◆ Discuss available revenue streams and options for obtaining additional revenue/funding