

# Pavement Management System Update

City Council Meeting

April 27, 2026

Damien R. Arrula – Assistant City Manager

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Bob Critchfield – Engineering Manager

Kirk Swanner – Associate Engineer

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# Presentation Overview



- Background
- Pavement Management System
- Network Overview
- Methodology & Pavement Condition Index
- Where We Are Today
- How We Got Here
- Comparative Analysis
- Summary
- Next Steps

# Background



- Presented update on findings to Public Works Committee April 30, 2024
- Received completed Pavement Management Report September 2024
- Presented Pavement Management Report to Council October 28, 2024
- Presented update to Public Works Committee April 15, 2026



Arrow Hwy at Silverwood Ave: Before

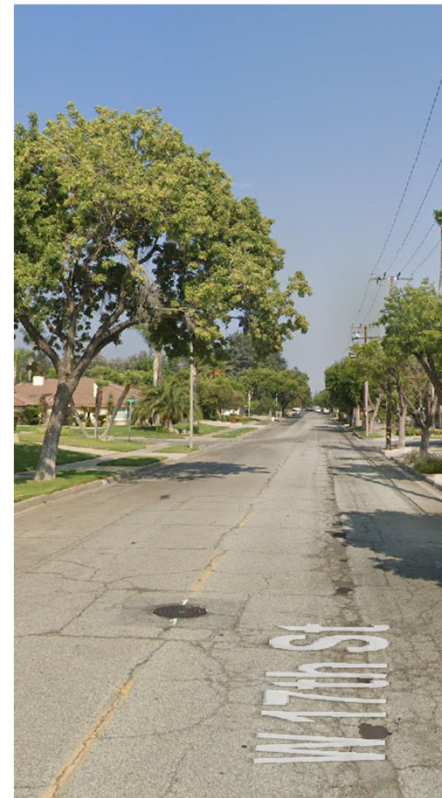


Arrow Hwy at Silverwood Ave: After

# Background - Why Pavement Matters



- Our network of paved roads and streets is one of the City's most valuable assets
- Represents hundreds of millions in replacement costs
- Directly Impacts
  - Quality of Life
  - Safety
  - Emergency Response
  - Public perception of the City
  - Liability / Claims
  - Property Values



17<sup>th</sup> Street: Before



17<sup>th</sup> Street: After

# Pavement Deterioration



- Pavement does not deteriorate linearly. It follows a curve.
- Long period of slow decline then rapid failure phase.
- Failure of early preservation requires more costly treatments later.



Washington Blvd: Before Slurry

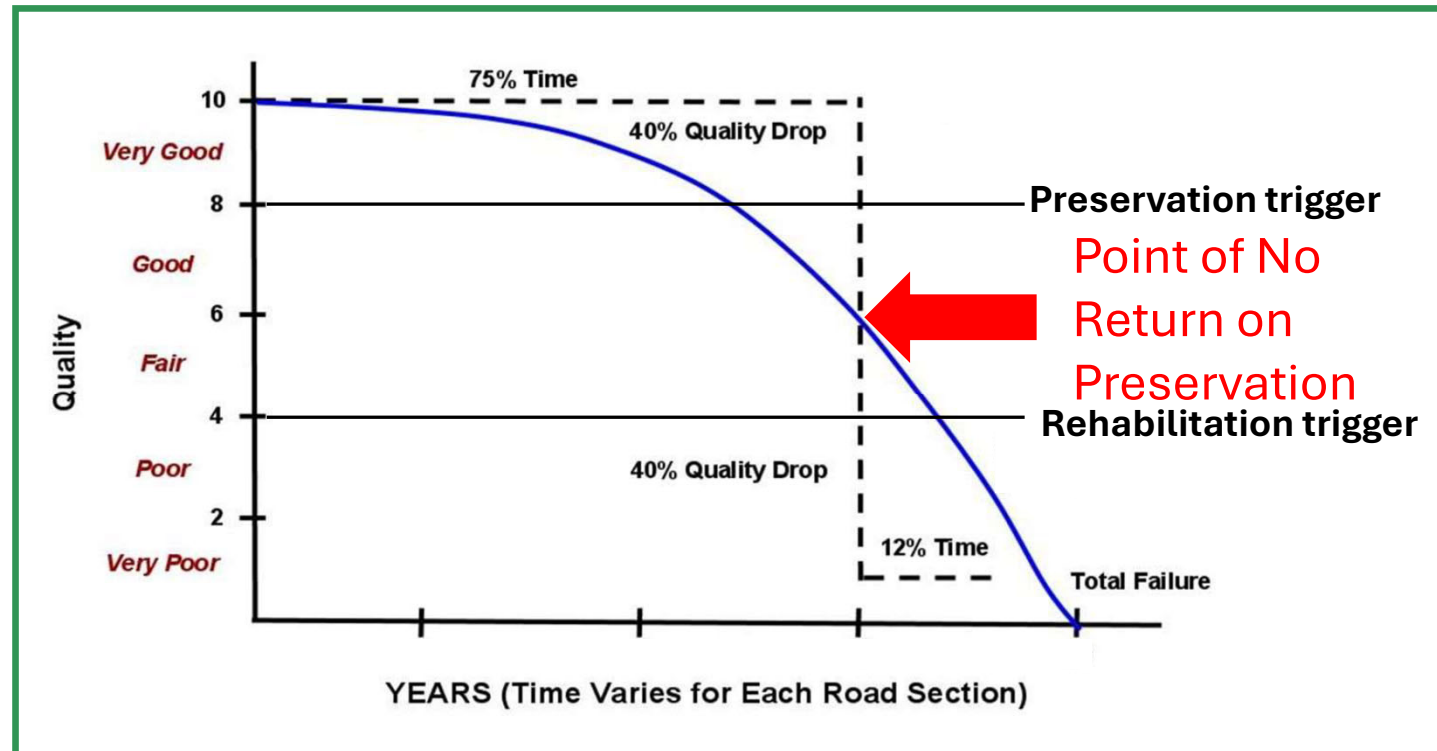


Washington Blvd: After Slurry

# Background - Pavement Deterioration



If we don't preserve our network of paved roads and streets, the damage and erosion will speed up and get worse faster - eventually hitting the point of no return where preservation is no longer an option.



# Background - Pavement Life Cycle & Preservation

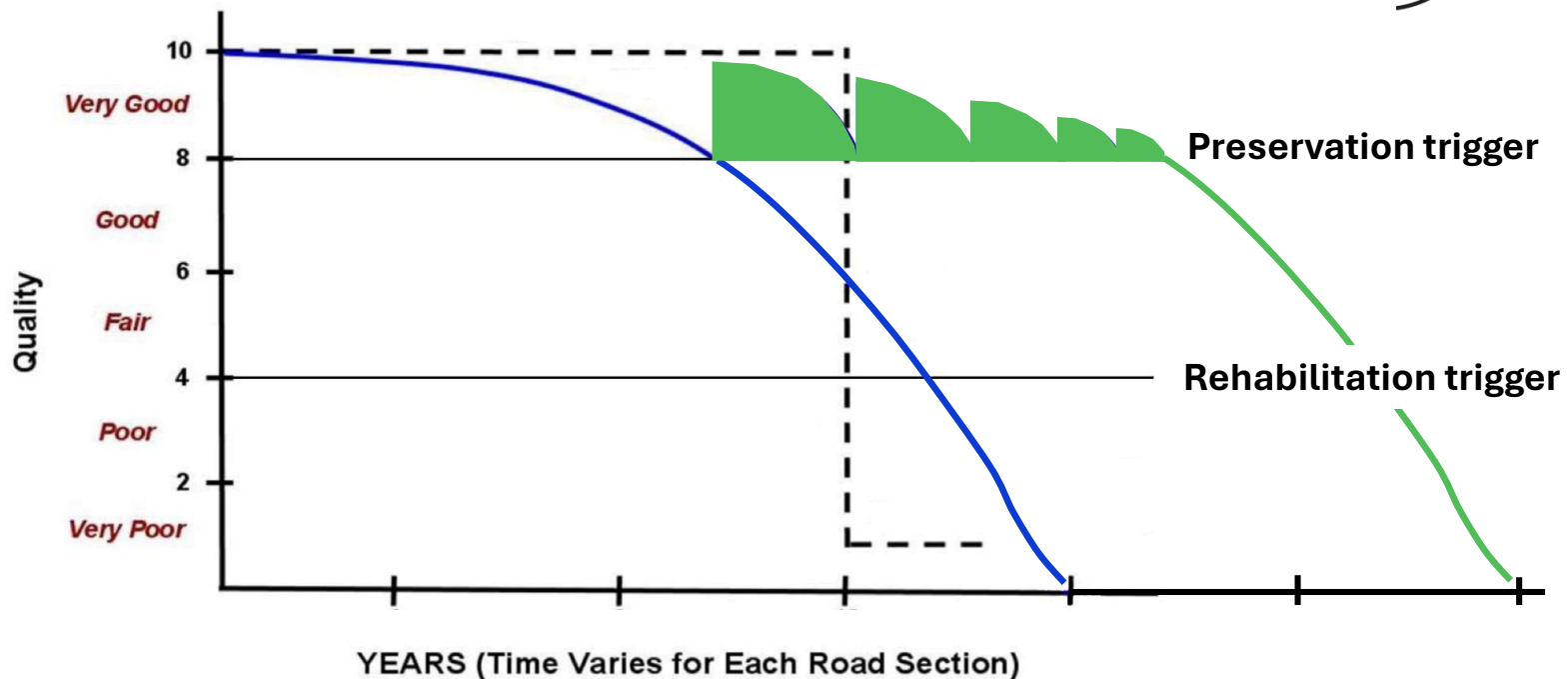


**Not putting oil in your engine will result in total engine failure and will cost much more.**

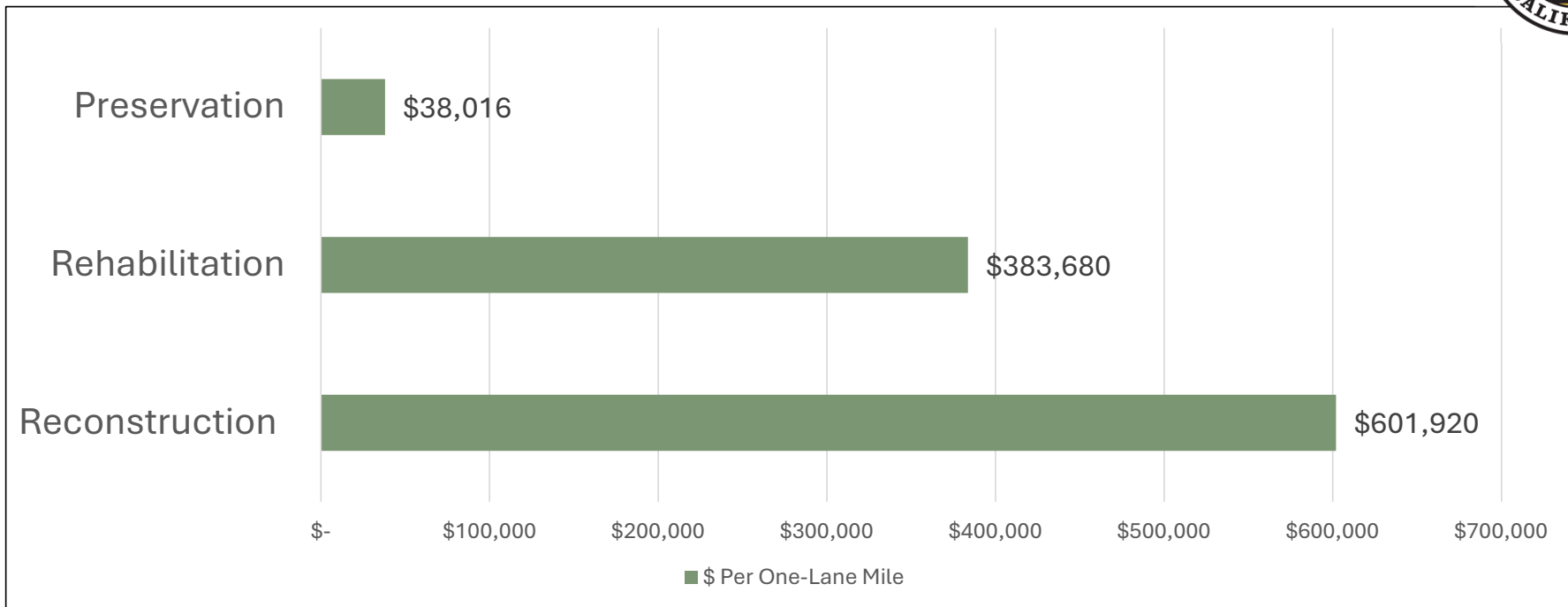
# Background - Pavement Life Cycle & Preservation



If we work on preserving our network, we can extend its life and spend significantly less before reaching that point of no return.



# Background - Cost per Mile of Pavement Treatment Methods



**Reconstruction is nearly 1,600% the Price of Preservation (Slurry Seal)**

# Why a Pavement Management System is Needed



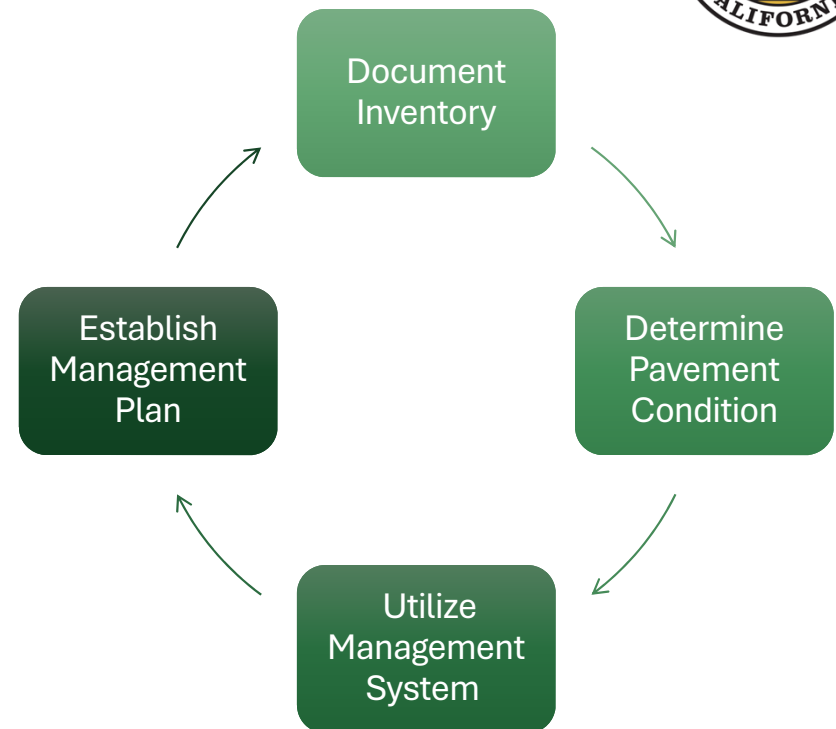
- What is a Pavement Management System
  - A structured, data-driven tool used to maintain networks cost effectively
- Why use a Pavement Management System
  - Efficiently conduct performance modeling & analysis
  - Predicts and tracks pavement condition over time
  - Create a network-level preventive maintenance strategy



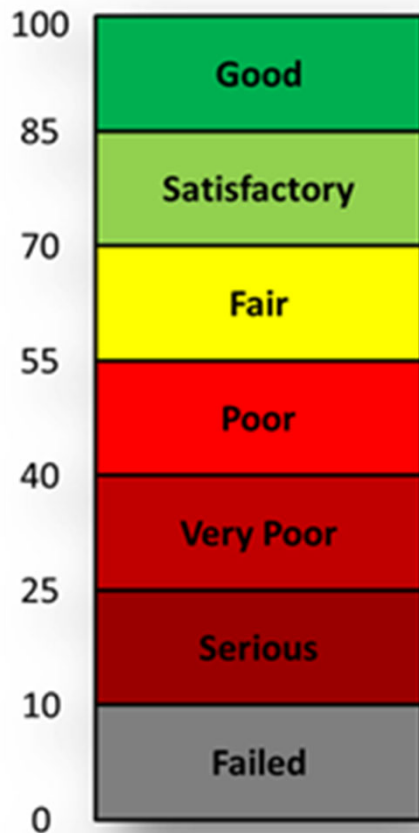
# How Does a Pavement Management System Work



- Maintains a Complete Inventory of Street Segments
- Determines Current Condition
- Predicts Future Deterioration Based on Industry-Wide Best Practices
- Recommends Timing of Cost-Effective Treatments
- Evaluates Budget Scenarios
- Identifies Funding Needs



# Pavement Condition Index



- What is a Pavement Condition Index (PCI)?
  - Measurement representing pavement condition on a scale from 0 to 100 for City's Roadway Network.
- Steps to Calculate PCI:
  - Inventory Street, Alley Segments & Parking Lots
  - Collect Distress
  - Analyze & Calculate with Industrywide Standardized Methods
- Best Practice to Repeat Analysis Every 2-3 Years

# Network Overview - Road Classifications



- Arterials: High-Speed, High-Volume Travel. Prioritizing mobility over access.
- Collectors: Collect Traffic from Locals, distribute to Arterials.
- Local: Low speed, Low Volume, Maximum Property Access
- Other
  - Alleys
  - Parking Lots



Principal Arterial – Euclid Ave.



Minor Arterial – 16<sup>th</sup> St.



Collector – 9<sup>th</sup> St.

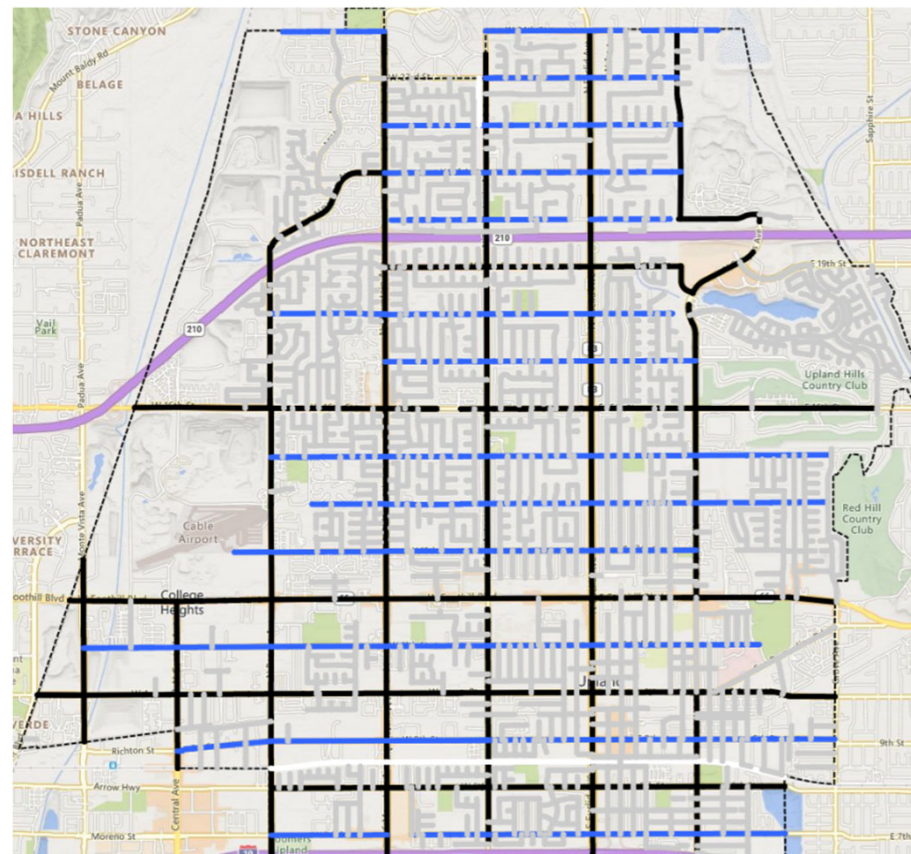


Local Street – Dublin Ct.

# Network Overview - Road Classification



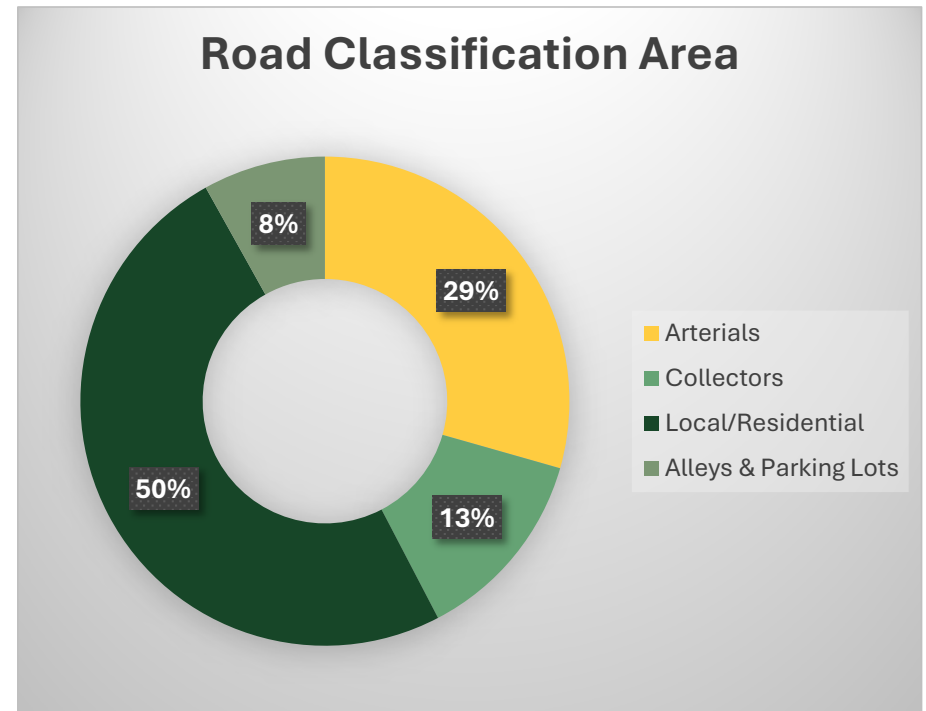
Map Legend	
	City Boundary
Functional Class	
	A - Arterial
	C - Collector
	O - Other
	R - Residential/Local



# Network Overview - Inventory



- 2,580 Network Segments
- 46 Million Square Feet of Surface Area
- 192 Centerline Miles of Roads
- 37 Centerline Miles of Alleys
- Total Investment Value \$557M



# Network Overview – Distress Types



Longitudinal Cracking



Transverse Cracking



Block Cracking



Alligator Cracking



# Network Overview – Distress Types



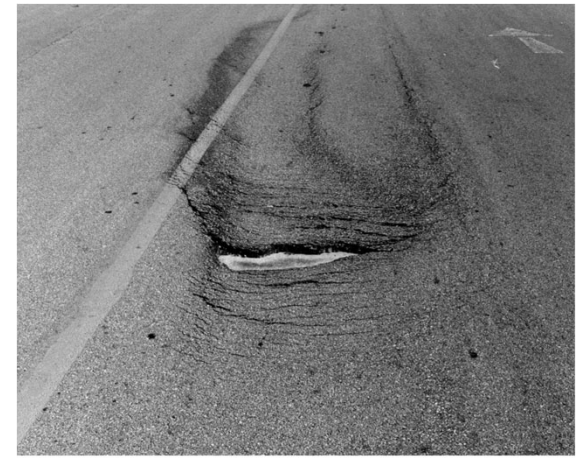
Potholes



Raveling



Shoving



# Network Overview – Distress Types



Joint Reflection Cracking



Bleeding



Patching

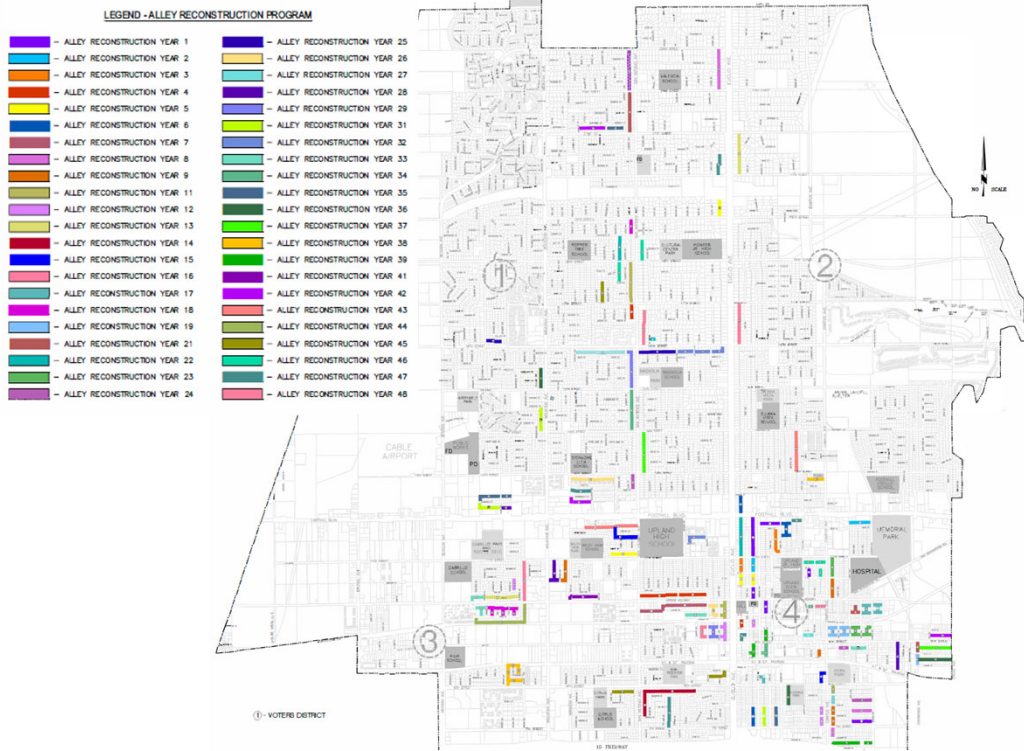


# Network Overview - Alley Improvement Master Plan

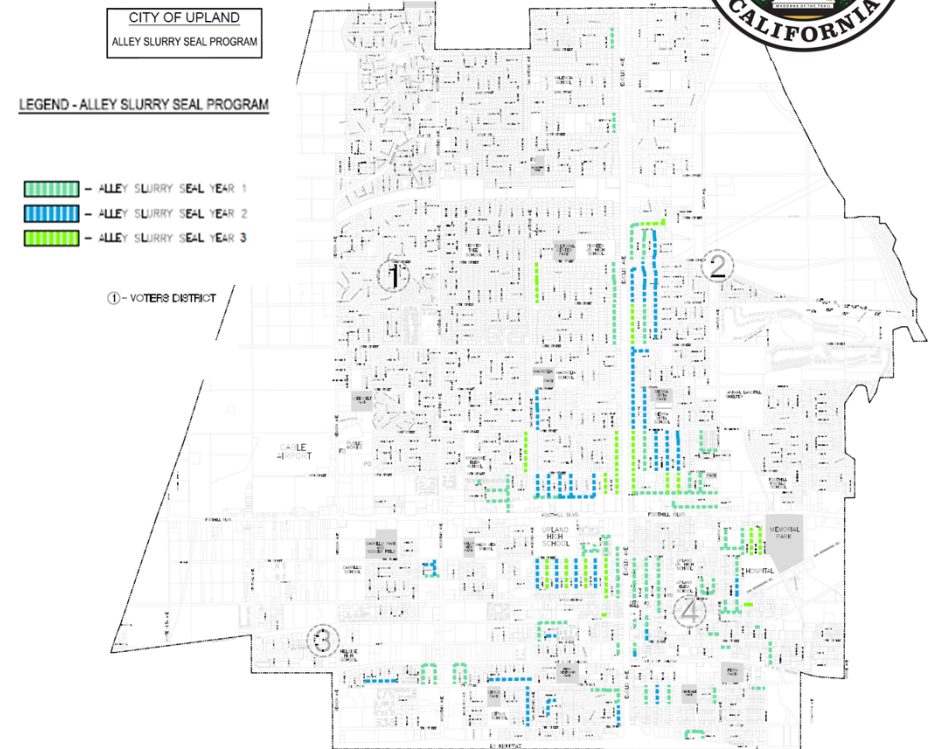


- Approved by City Council on September 25, 2017
- 48-Year Plan to Reconstruct 19.5 Miles (53%) of Alleys
- Currently in Year 6
- Remaining 17.5 Miles (47%) of Alleys to be slurried every 10 years
- Funding Shortfall
- Funding Sources for Alley Maintenance
  - General Fund
  - One-Time Funds (ARPA)

# Network Overview - Alley Improvement Master Plan



**Alley Reconstruction Map**



**Alley Slurry Seal Map**

# Network Overview – Data Collection



## Collection methods

- Visual & Electronic

## Visual Collection

- Walk 100 Foot Sample & Project Throughout Remaining Segment
- Subjective

## Upland Utilizes Electronic Collection

- State-of-the-Art Technology
  - Laser Crack Measuring System (100x more accurate than Lidar scanning)
- Efficient & Cost-Effective
  - Compared to walking
- Objective

## Electronic Data Collection Equipment



# Pavement Management System Consultant - Transmap



- Sole Focus on Pavement Management Systems since 1994
- Completed Over 800 Roadway Asset Management Projects
- Southern California Experience:
  - Irvine
  - Glendale
  - Simi Valley
  - Rialto
  - Hesperia



**Howard Luxhoj**  
**President & CEO**

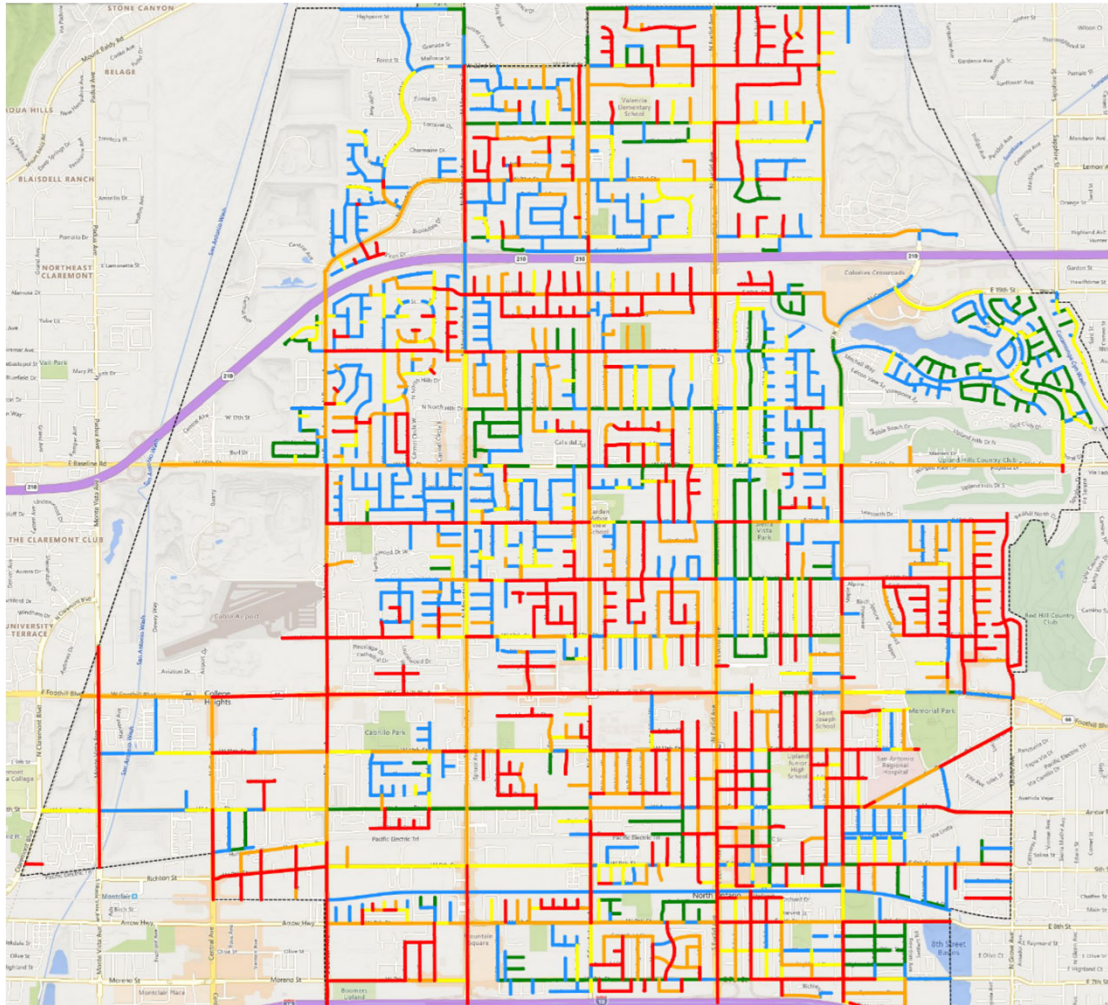
28 Years Experience  
Specialist in developing and implementing quality control measures for roadway condition assessment projects; encompassing over 400,000 miles of data collected nationwide.



**Craig Schorling**  
**Vice President**

30 Years Experience  
Expert of mobile mapping vehicles; creating and managing pavement asset management software.

# Pavement Condition Index Map



PCI Scale

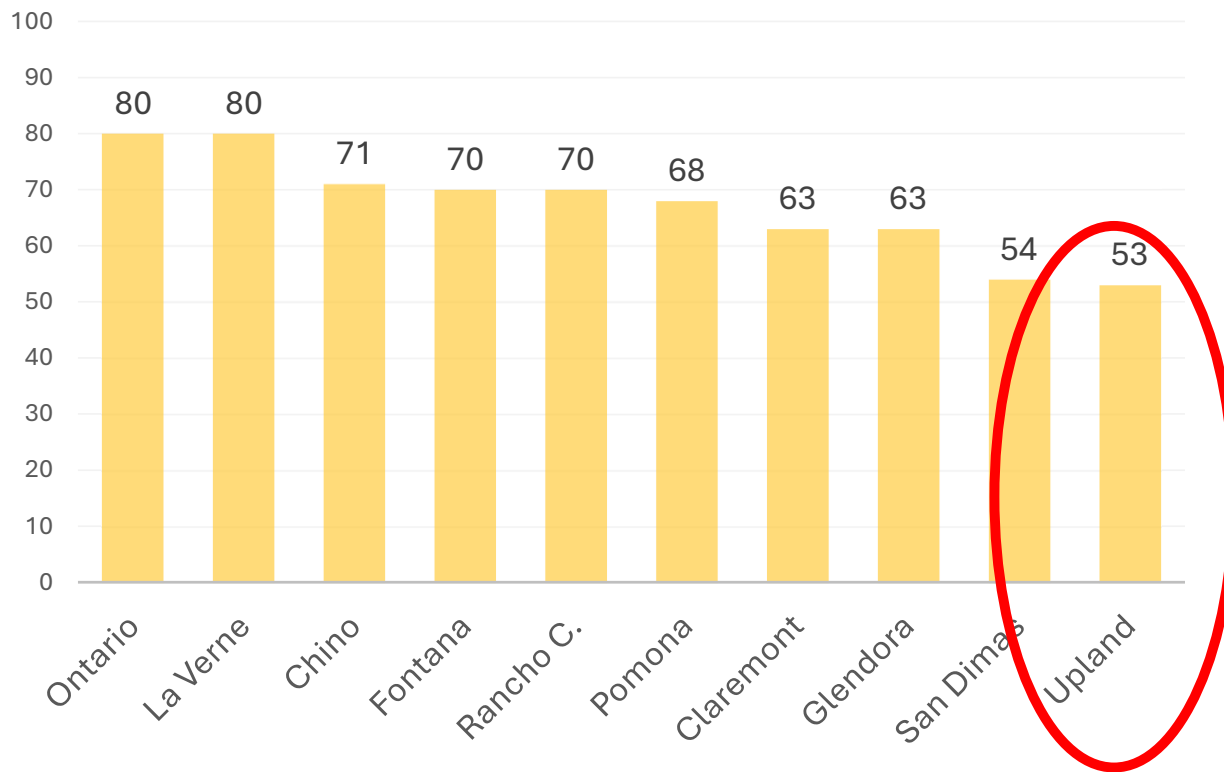
100	Very Good
85	Good (Non-Load)
70	Good (Load)
50	Poor
25	Very Poor
0	



# Where We Are Today - PCI



Regional PCI Values



## Upland's PCI is 53

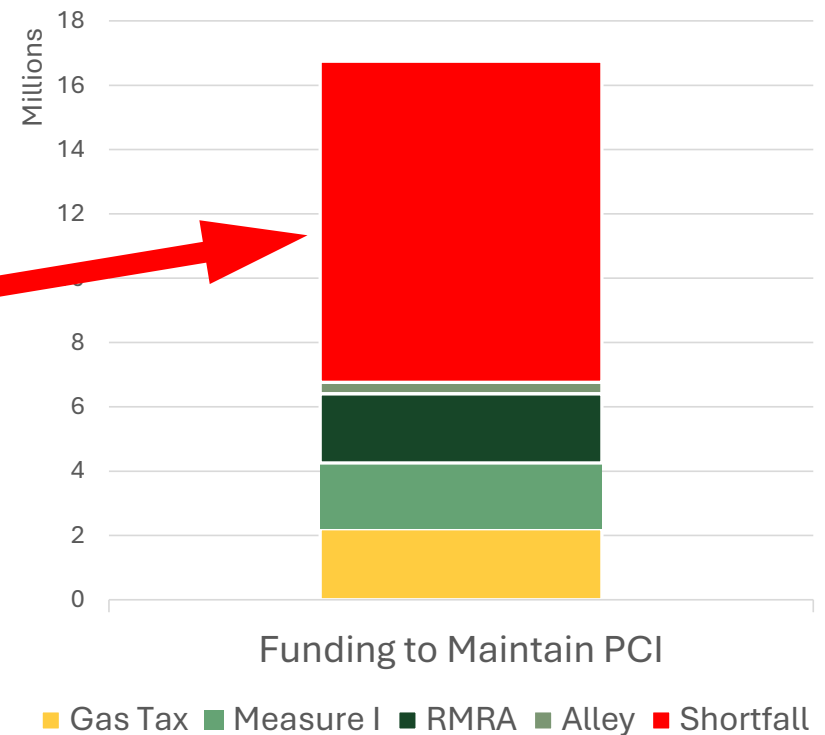
- Regional Average is 69
- Lowest in the Region
- **Target PCI: 76-80**

# Where We Are Today – Funding Shortfall



When data collection was last performed in 2024:

- Current Funding Levels: \$6.8M
  - Inclusive of Street & Alley Funding
- Funding Required to Maintain Current PCI is \$16.4M\*
  - Annual Shortfall of \$9.6M
- Funding to Achieve PCI of 70 in 5 years is \$28.1M annually\*



\* Does not include funding for Public Parking Lots

# Where We Are Today – Funding Shortfall



	2024	2025	2026	2027	2028	2029
Arterial AC Roads	\$ 73,715,405	\$ 73,200,000	\$ 80,100,000	\$ 88,100,000	\$ 95,600,000	\$ 103,400,000
Collector AC Roads	\$ 15,491,790	\$ 20,300,000	\$ 22,900,000	\$ 24,700,000	\$ 26,600,000	\$ 29,800,000
Local AC Roads	\$ 71,227,382	\$ 80,800,000	\$ 91,200,000	\$ 101,000,000	\$ 110,600,000	\$ 120,600,000
<b>Sub-total</b>	<b>\$ 160,434,577</b>	<b>\$ 174,300,000</b>	<b>\$ 194,200,000</b>	<b>\$ 213,800,000</b>	<b>\$ 232,800,000</b>	<b>\$ 253,800,000</b>
Alleys	\$ 11,280,231	\$ 13,500,000	\$ 14,700,000	\$ 16,000,000	\$ 17,200,000	\$ 18,400,000
Parking Lots	\$ 6,928,025	\$ 8,100,000	\$ 8,400,000	\$ 8,900,000	\$ 9,300,000	\$ 9,600,000
<b>Sub-total</b>	<b>\$ 18,208,256</b>	<b>\$ 21,600,000</b>	<b>\$ 23,100,000</b>	<b>\$ 24,900,000</b>	<b>\$ 26,500,000</b>	<b>\$ 28,000,000</b>
<b>TOTAL</b>	<b>\$ 178,642,833</b>	<b>\$ 195,900,000</b>	<b>\$ 217,300,000</b>	<b>\$ 238,700,000</b>	<b>\$ 259,300,000</b>	<b>\$ 281,800,000</b>

Current Deferred Maintenance Liability **\$210M**

# How We Got Here



1. The accumulation of \$210M in deferred maintenance liability is a direct result of:
  - Funding
  - Reduced CIP Engineering Operations Staffing
2. Examples Include:
  - No Public Works Analysts in CIP Engineering Operations
  - No Public Works Administrative support within CIP Engineering Operations
3. Due to lack of support staff, Engineering (CIP Project Managers) are performing administrative and analytical duties associated with each project
4. Extended project delivery timelines
5. Mismatch of community expectations vs project delivery capabilities

# Right-of-Way Staffing



The Streets Maintenance Division is primarily responsible for maintaining sidewalks and performing pothole repairs.

In addition, they do the following:

- Special Projects
- Special Events
- Curb & Gutter
- Driveway Approaches
- Traffic Control
- Vector Control
- Weed Abatement
- Storm Cleanup
- Street Signs
- Banner Removal/Install
- Illegal Dumping
- Street Striping
- Red Curb Painting
- Trees
- Landscape Irrigation
- Heavy Haul Transportation

# Right-of-Way Staffing

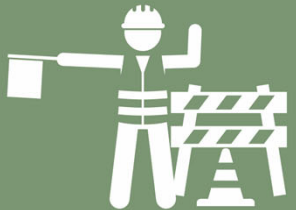


FY 2024 - 8 Full-Time Streets Maintenance Workers

FY 2026 - 5 Full-Time Streets Maintenance Workers

- In June 2025, a comparative analysis revealed Upland Public Works was 63% below the average of adjacent cities.

Goal: Separate Streets and Right-of-Way to create 2 separate divisions



# CIP Engineering Division Staffing – City Comparative Analysis

City	Population	CIP FTEs	CIP FTE per 1,000 Residents
Redlands	72,700	12	0.17
Rancho	177,700	28	0.16
Pomona	151,700	31	0.20
Ontario	180,000	47	0.26
Montclair	37,700	6	0.16
Fontana	216,200	36	0.16
Claremont	37,300	7	0.19
Chino	93,300	17	0.18
<b>AVERAGES</b>		<b>23</b>	<b>0.19</b>
<b>Upland</b>	<b>79,684</b>	<b>8</b>	<b>0.10</b>

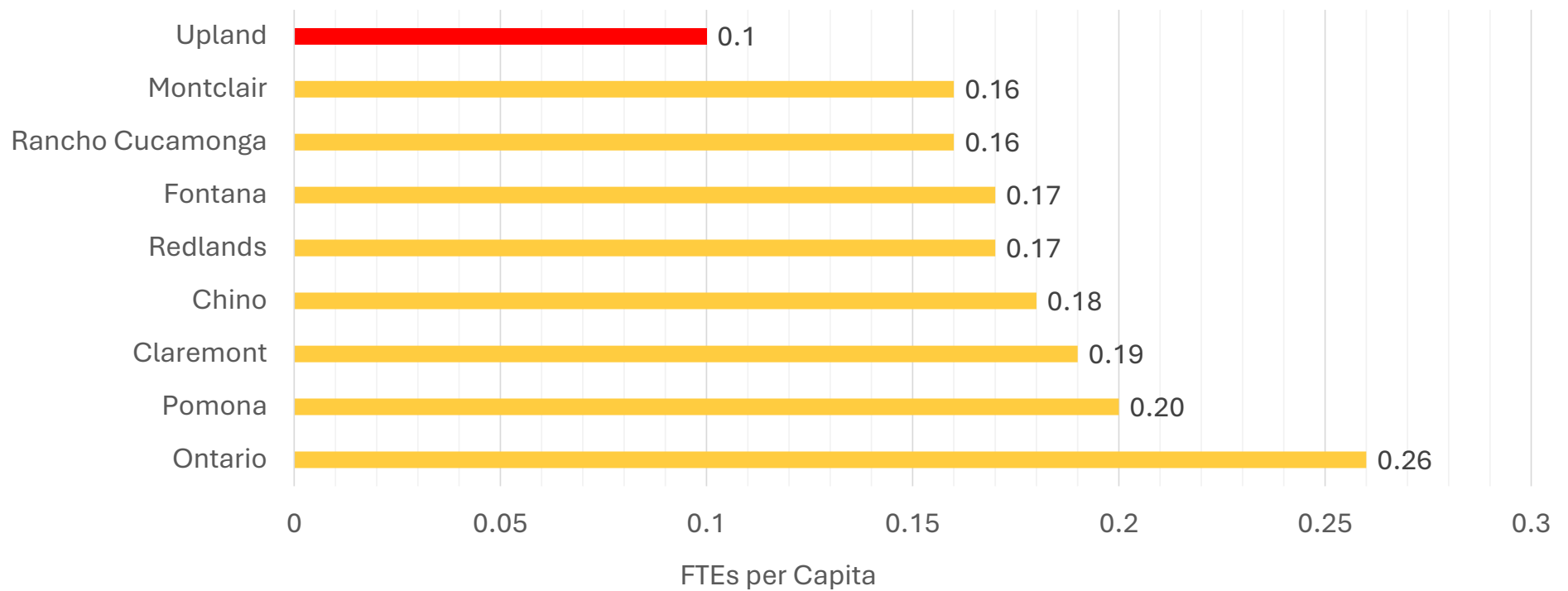


Source: Information provided is based on each city's FY 2025-2026 Adopted Budget and/or FY 2024-2026 Adopted Budget where available.

# CIP Engineering Division Staffing – City Comparative Analysis



Staffing Index: Full-Time Employees Per 1,000 Residents



# CIP Engineering Division Staffing – City Comparative Analysis

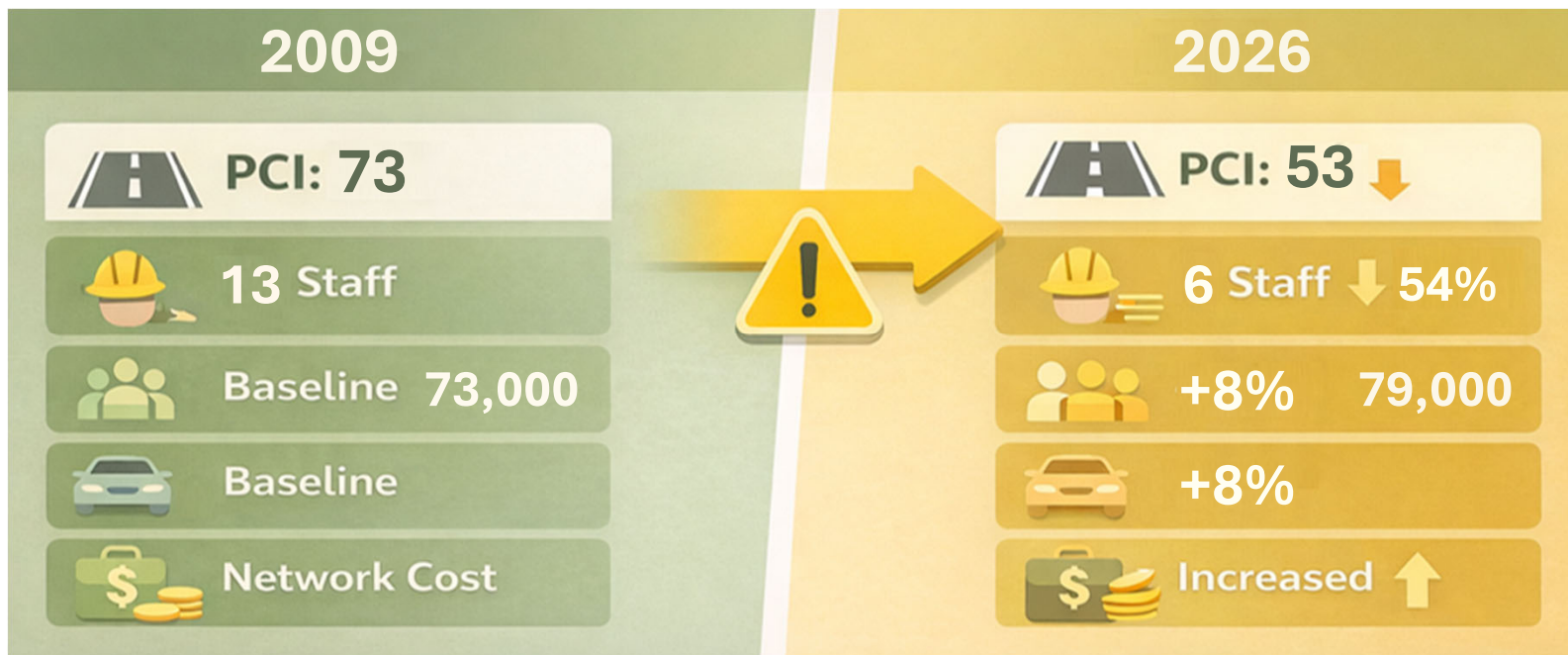


## Comparative Analysis Findings:

- Upland has 0.10 FTEs per 1,000 residents
- The average is 0.19 FTEs
- Upland is 47% below the regional average
- 8 additional staff would bring us to the average
- However, our need is much higher than the average given the lower PCI



# Comparative Analysis – Upland Then vs Now



Engineering CIP Staff is **maintaining more demand with fewer resources** resulting in declining pavement condition with growing long-term costs.

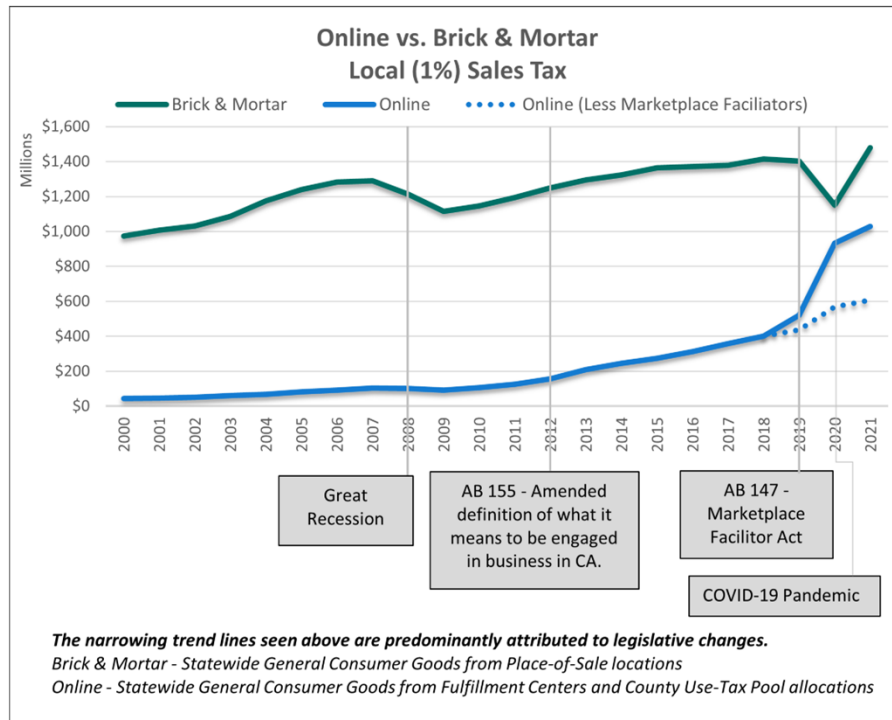
# Comparative Analysis – Upland Then vs Now



From 2009 to 2026:

- PCI declined from 73 to 53
- Staff reduced from 13 to 6; 54% reduction
- Upland population increased by over 8%
- Network cost significantly increased
- Engineering CIP Staff is **maintaining more demand with fewer resources** resulting in declining pavement condition with growing long-term costs.

# Comparative Analysis – Upland Then vs Now



- 2009: E-commerce sales 4% of total retail sales\*
- 2025: E-commerce sales now 16% of total\*
- E-commerce sales increased by 400% from 2009 to 2025
- Delivery vehicles weigh at least 500% more than average vehicles
- Increased delivery vehicle traffic coupled with weight results in a significant impact on citywide pavement condition

\* Based on Census.gov Quarterly Retail E-Commerce Sales Report

# Project Cost Analysis – Then vs Now



## 2006 Project Costs

## 2026 Project Costs

### Reconstruction Cost

- \$43.37 per Square Yard

**↑ 197%**

### Reconstruction Cost

- \$85.50 per Square Yard

### Asphalt Cost

- \$66.00 per Ton

**↑ 148%**

### Asphalt Cost

- \$98.00 per Ton

# Summary - Recent Strategies



- Created project management training to increase project management capacity within existing staff
- Implementation of new technologies to prolong asphalt deterioration curve
  - Rubberized Asphalt & ARAM Cape Seal
- Leveraging GIS Technology to create layered Infrastructure Maps to Prioritize CIP Projects

# Summary - Recent Strategies



- Streamlining procurement by Piggybacking projects
- Increasing purchasing power by use of Cooperative agreements
- Combining CIP Bid Packages/Change Orders
- Creation of Bench List of Consultants: Architectural Design, Construction Management, Engineering, Geotechnical, and Landscape Architecture & Design

# Summary - Potential Funding Sources



- Business License Reform
- Transaction & Use Tax (Sales Tax Add On)
- Solid Waste Program Fee Cleanup
- Federal, State, & County Earmarks
- Additional Grants
- Need for 10 New Engineering Division Staff based upon CIP deferred maintenance backlog & PCI of 53

# Summary - Next Steps



## Secure:

- Additional Funding Sources
- Additional Staffing to meet expectations

## Prepare Future Pavement Management Report:

- Return to Public Works Committee – July 2027
- Present to City Council – August 2027
- With new available resources, update Implementation strategy
- Target Goal: Increase PCI from 53 to a range of 76-80

## Analyze:

- Benefits of a separate, dedicated Right-of-Way Division



**Thank You!**