

COUNTY OF SAN MATEO



# **County of San Mateo**

## **Department of Public Works**

### **Road Maintenance Program**

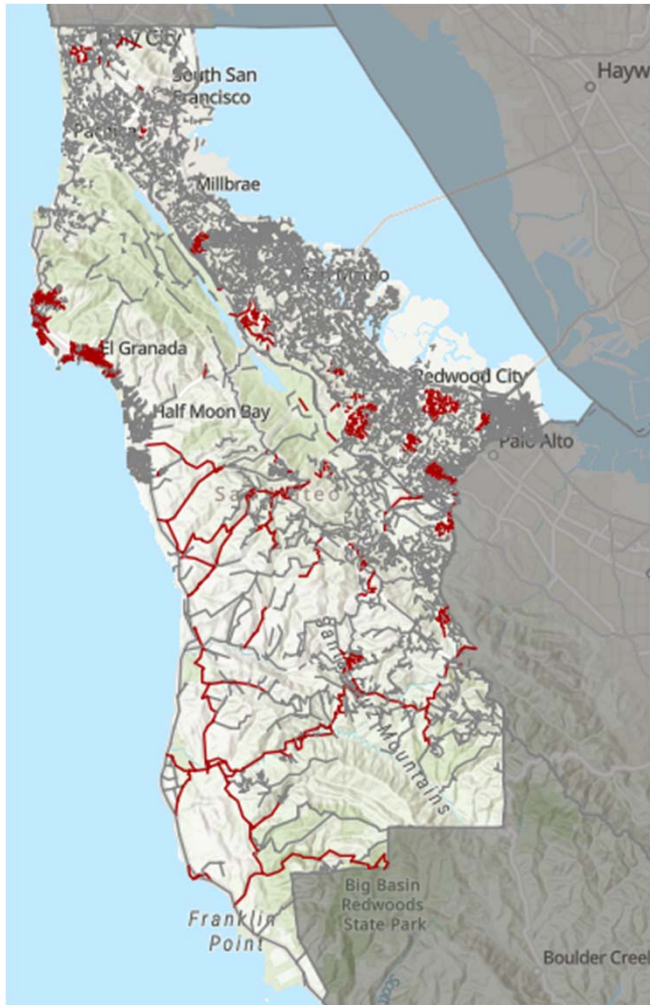
**Krzysztof Lisaj**  
**Deputy Director of Public Works**  
**Engineering and Resource Protection**  
April 20, 2023



# Agenda

- County Roadway Network Information
- Type of Treatments
- Pavement Condition Index
- Project Selection Criteria
- Design Consideration

# County Roadway Network Information

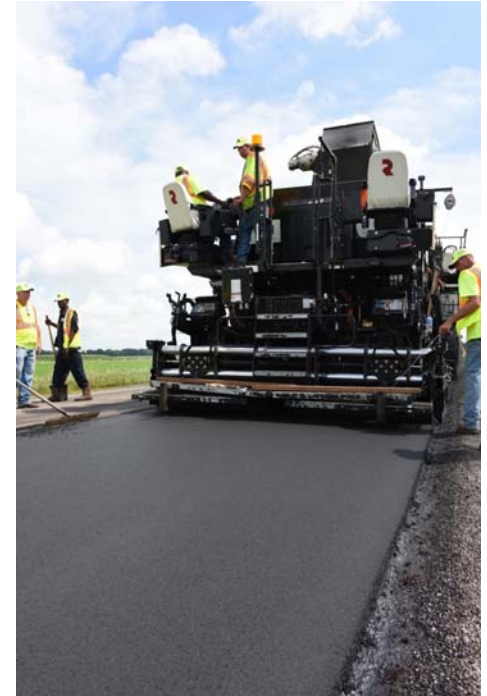


- Department of Public Works maintains 316 center line miles and 642 lane miles of County roadways
- 2% Arterial
- 30% Collector
- 68% Residential/Local

<https://www.smcgov.org/publicworks/county-maintained-roads>

# Types of Treatments

- Pavement Preservation
- Rehabilitation
- Reconstruction





# Pavement Preservation - Crack Seal



<b>Crack Seal</b>	<b>Optimum Performance</b>	<b>Average Performance</b>	<b>Stop-Gap Performance</b>
<b>Pavement Condition</b>	A	B	C
<b>PCI Range</b>	85 - 100	70 - 85	55 - 70
<b>Life Extension</b>	6 - 7 years	4 - 6 years	1 - 3 years

# Pavement Preservation – Fog Seal



<b>Fog Seal</b>	<b>Optimum Performance</b>	<b>Average Performance</b>	<b>Stop-Gap Performance</b>
Pavement Condition	B	B	B - C
PCI Range	70-100	65-75	55 -65
Life Extension	4 years	3 years	2 years



# Pavement Preservation – Chip Seal



Applying Binder

<b>Chip Seal</b>	<b>Optimum Performance</b>	<b>Average Performance</b>	<b>Stop-Gap Performance</b>
Pavement Condition	B	C	D
PCI Condition	80	60	40
Life Extension	7 -10 years	3 - 5 years	1 - 3 years





## Pavement Preservation – Chip Seal



Placement of Aggregate



## Pavement Preservation – Chip Seal



Rolling of Aggregate



## Pavement Preservation – Chip Seal



Sweeping of Aggregate

# Pavement Preservation – Slurry Seal



## Slurry Application

<b>Slurry Seal</b>	<b>Optimum Performance</b>	<b>Average Performance</b>	<b>Stop-Gap Performance</b>
<b>Pavement Condition</b>	A	B-C	Not Recommended
<b>PCI Range</b>	>80	60-80	
<b>Life Extension</b>	7-10	5-7.5	





# Pavement Preservation – Slurry Seal



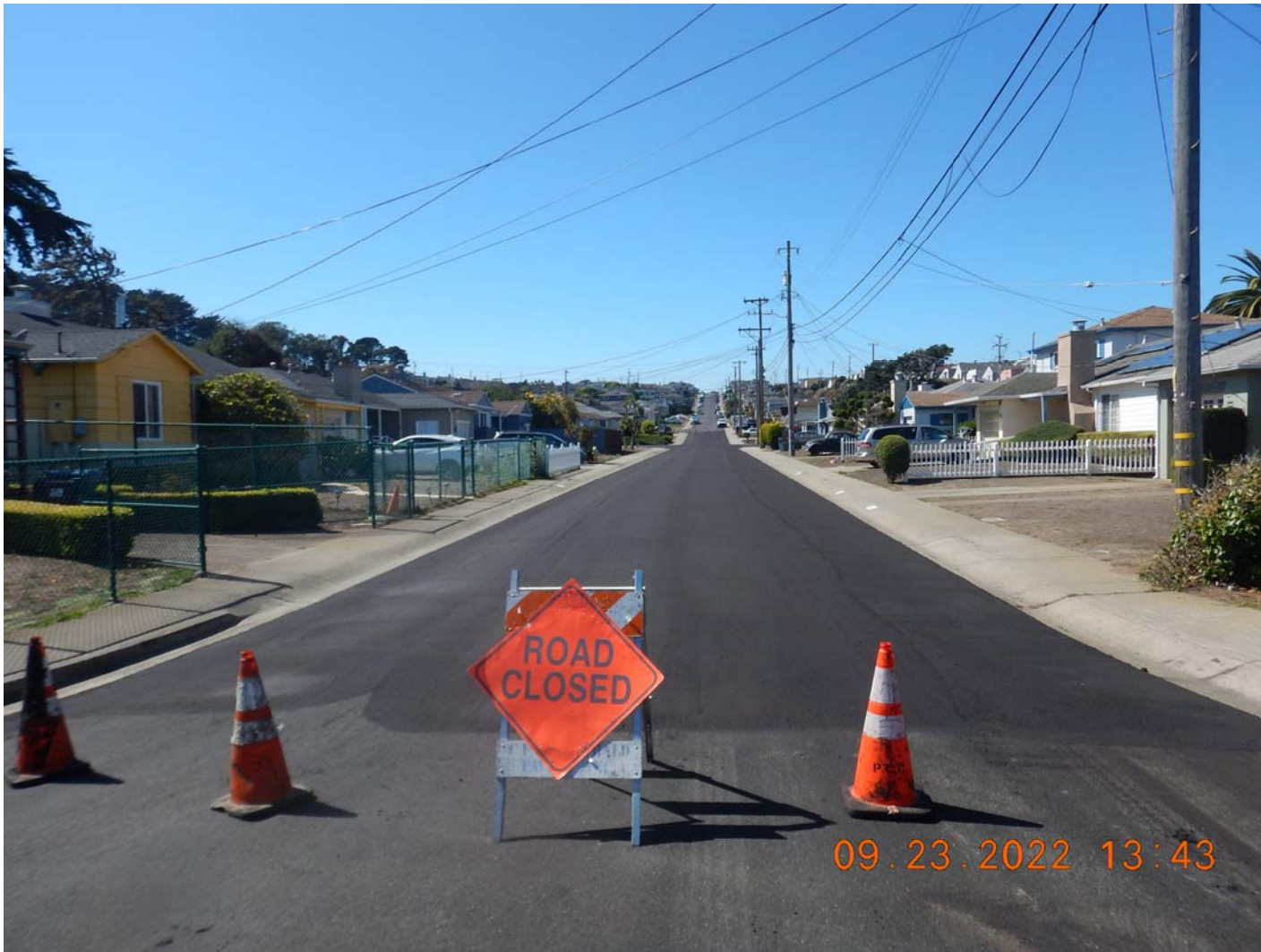
Slurry Application and Hand Work

## Pavement Preservation – Slurry Seal



Completed Slurry – One lane to allow traffic

## Pavement Preservation – Slurry Seal



Completed Slurry – Roadway closed to allow slurry to set



## Pavement Preservation – Slurry Seal



Comparison of slurry thickness to quarter



## Pavement Preservation – Micro Surfacing



Micro Surfacing application

Micro surfacing	Optimum Performance	Average Performance	Stop-Gap Performance
Pavement Condition	B	B-C	C
PCI Range	75-85	65-75	55-65
Life Extension	8-10 years	6-8 years	4-6 years





## Pavement Preservation – Micro Surfacing



Micro Surface – Hand work on edges of roadway



## Pavement Preservation – Micro Surfacing



Completed application



## Pavement Preservation – Cape Seal



Applying Binder

<b>Cape Seal</b>	<b>Optimum Performance</b>	<b>Average Performance</b>	<b>Stop-Gap Performance</b>
Pavement Condition	B	C	D
PCI Range	80	60	40
Life Extension	8 - 10 years	6 - 8 years	4 - 6 years





## Pavement Preservation – Cape Seal



Roadway completed with chip seal application



## Pavement Preservation – Cape Seal



Application of Slurry or Micro Surfacing as top layer



## Rehabilitation – Resurfacing



Asphalt Concrete (AC)  
Paver Application

Resurfacing	Optimum Performance	Average Performance	Stop-Gap Performance
Pavement Condition	A-B	B-C	C
PCI Range	75+	65-75	55-65
Life Extension	20+	15-20	10-15

## Rehabilitation – Resurfacing



Drum Roller – Rolling AC after placement by paving machine



## Rehabilitation – Resurfacing



New AC pavement placed on top of existing.

## Rehabilitation – Resurfacing



Completed two lane roadway and striping



# Reconstruction – Reconstruction with Cement Treated Based



Grinding of existing pavement

FDR	Optimum	Moderate	Reactive
Type of Distress	Any distress in the treated layers	Minor drainage and/or some subgrade instability	Drainage issues and subgrade instability
Depth of Distress	Extends no deeper than treated layers	Below FDR treatment	Below FDR treatment
Life Extension	25+ years	15-25 years	5-15 years



## Reconstruction – Reconstruction with Cement Treated Based



Grading of subbase prior to cement treatment



# Reconstruction – Reconstruction with Cement Treated Based



Cement Treatment Machine mixing soil with cement



## Reconstruction – Reconstruction with Cement Treated Base



Paving first lift of AC after cement treatment of base



# Reconstruction – Reconstruction with Cement Treated Based



Rolling of new pavement





## Reconstruction – Reconstruction with Cement Treated Based



Finished roadway prior to striping



# Pavement Condition Index (PCI)

The Pavement Condition Index (PCI) is a numerical index between 0 and 100 which is used to indicate the general condition of a pavement.

PCI Range	Condition Category
90-100	Excellent
70-89	Very Good
50-69	Good
25-49	Poor
0-24	Very Poor or Failed



# EXCELLENT CONDITION CATEGORY (PCI = 90-100)





## Very Good Condition Category (PCI=70-89)



# GOOD CONDITION CATEGORY (PCI = 50-69)





## POOR CONDITION CATEGORY (PCI = 25-49)

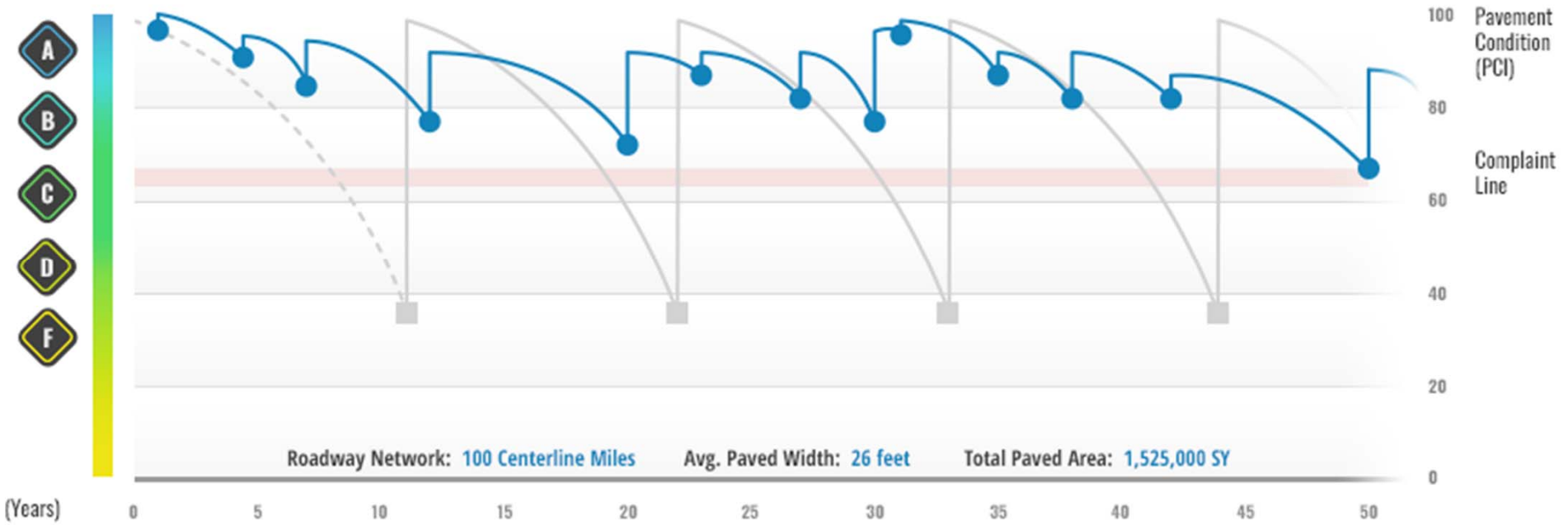
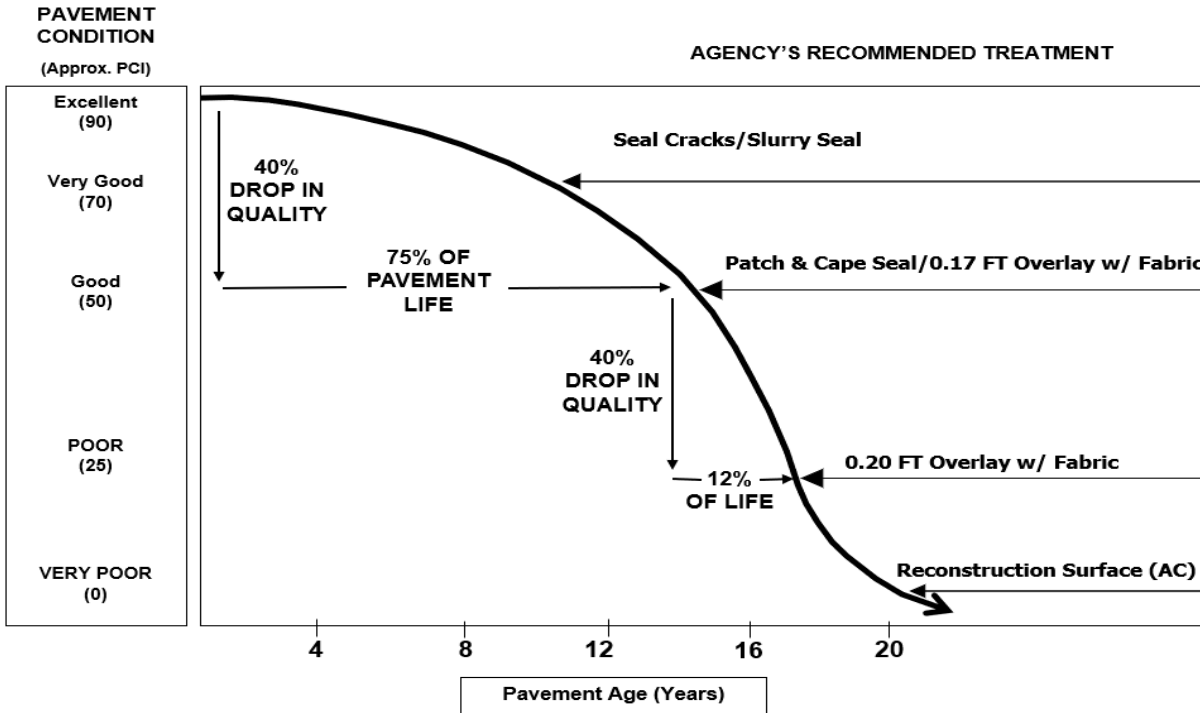


# VERY POOR OR FAILED CONDITION CATEGORY (PCI = 0-24)



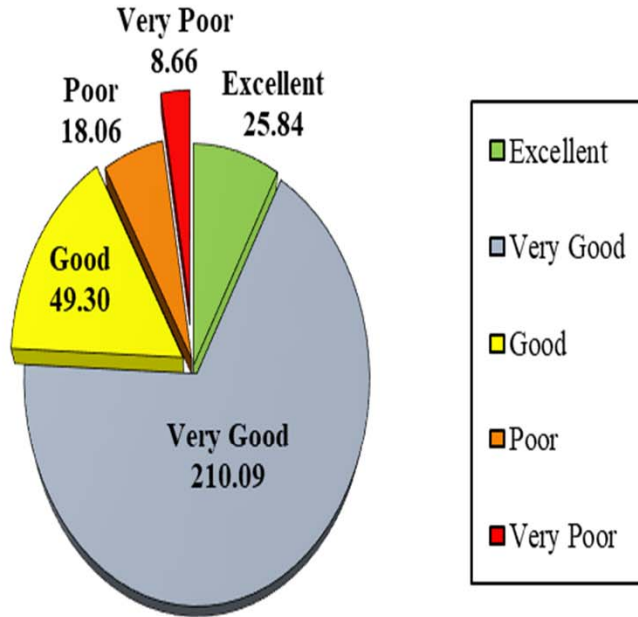


# Pavement Life Cycle



# County's PCI

## Centerline Miles of Streets by Condition



PCI By Functional Class	
CLASSIFICATION	PCI
Arterial	76
Collector	78
Residential/Local	73
<b>Overall Network</b>	<b>75</b>

Percentage of Network Area by Functional Class and Condition Category					
Condition Class	PCI Range	Arterial	Collector	Residential	Total
Excellent	90-100	0.23%	4.95%	5.18%	10.36%
Very Good	70-89	2.44%	26.51%	38.09%	67.04%
Good	50-69	0.67%	3.91%	10.89%	15.47%
Poor	25-49	0.00%	1.61%	3.56%	5.16%
Very Poor	0-24	0.00%	0.16%	1.81%	1.97%
<b>Totals</b>		<b>3.34%</b>	<b>37.13%</b>	<b>59.53%</b>	<b>100.00%</b>



# Comparison to Other Cites/Counties

## Pavement Condition Index (PCI) for Bay Area Jurisdictions, 2021

Jurisdiction	County	Total Lane Miles	3-Year Moving Average		
			2019	2020	2021
<b>Very Good (PCI= 80–89)</b>					
Cupertino	Santa Clara	297.7	84	85	84
Orinda	Contra Costa	187.4	75	81	83
Palo Alto	Santa Clara	414.4	84	84	83
Dublin	Alameda	327.0	85	84	82
Brentwood	Contra Costa	425.9	82	81	81
Solano County	Solano	930.1	81	80	80

## Pavement Condition Index (PCI) for Bay Area Jurisdictions, 2021 (continued)

Jurisdiction	County	Total Lane Miles	3-Year Moving Average		
			2019	2020	2021
Oakley	Contra Costa	293.2	77	76	75
Brisbane	San Mateo	66.7	77	76	75
San Francisco	San Francisco	2144.6	74	74	74
Santa Clara	Santa Clara	608.3	75	75	74
Moraga	Contra Costa	113.3	72	74	74
Newark	Alameda	256.0	75	74	73
Walnut Creek	Contra Costa	435.0	73	73	73
San Mateo County	San Mateo	628.7	73	74	73
Morgan Hill	Santa Clara	301.7	72	73	73
South San Francisco	San Mateo	294.9	75	73	73

## Agency's Maintenance Treatments By Condition Category

Condition	PCI Range	Typical Maintenance Treatment
Excellent	90-100	<ul style="list-style-type: none"> <li>• Do Nothing.</li> </ul>
Very Good	70-89	<ul style="list-style-type: none"> <li>• Seal Cracks</li> <li>• Slurry Seal</li> </ul>
Good	50-69	<ul style="list-style-type: none"> <li>• Patch and Slurry Seal</li> <li>• Patch and Cape Seal</li> <li>• 0.17 ft. Overlay w/ Fabric</li> </ul>
Poor	25-49	<ul style="list-style-type: none"> <li>• 0.20 ft. Overlay w/ Fabric</li> </ul>
Very Poor	0-24	<ul style="list-style-type: none"> <li>• Reconstruct Structure</li> </ul>



# Project Selection Criteria – Pavement Preservation

## **Crack Sealing Program**

- ❖ County Road's Crews crack seals roadways identified as part of the Pavement Preservation Work to be done at least 6 months ahead of the Project, and other areas as needed

## **Pavement Preservation Program**

- ❖ County staff review existing PCI of roadways, and look for opportunities to group roads together by area for a project.
- ❖ Develop group of roads by area for economies of scale and proximity

## **Chip Seal Program**

- ❖ Chip Seal Program looks at roads West of Hwy 35 and are on a 7 year cycle

## **ADA Ramp Program**

- ❖ ADA Ramp Program (new) will look 2 years ahead of the Pavement Preservation Program to allow for use of micro surfacing

# Project Selection – Reconstruction Projects

- ❖ Roadway standards and priority lists have been established for several areas
- ❖ Remaining roadways are located in North Fair Oaks and West Menlo
- ❖ County works within approved process
  - ❖ Field survey and mark available options
  - ❖ Send Survey out to Property Owners for input
  - ❖ Hold community meeting to provide information on options, impacts, etc.
  - ❖ Based on results of survey, project moves forward, or we go onto to next road



# Project Selection Criteria– Sign Replacement and Striping Program

## **Sign Replacement Program**

Sign replacement is area by area. Department's Traffic Division performs an inventory of existing signs and replaces them to meet current standards.

## **Striping Program**

Striping plan is area by area. Department's Traffic Division performs a inventory of existing striping and either replaces in kind, or in conjunction with a project.

Areas to be inventoried next:

2023 - West Menlo, NFO, Devonshire, Sequoia Tract

2024 - Emerald Lake Hills, Los Trancos, Ladera

2025 - Rural Areas



# Design Consideration

- ❖ Safe Routes to School Program and School Walk Audits
- ❖ Active Transportation Plan
- ❖ Local Road Safety Plan
- ❖ Approved Studies – Project Specific (i.e. Alpine Road Study, etc.)
- ❖ Opportunities for improvements to bicycle or pedestrians facilities based on field investigation
- ❖ Bringing facilities up to current industry standards/codes
- ❖ Public Input/Comments



# QUESTIONS?

COUNTY OF SAN MATEO

