

ATTACHMENT A



Pavement Management of City Roads



Overview of Victorville Road System

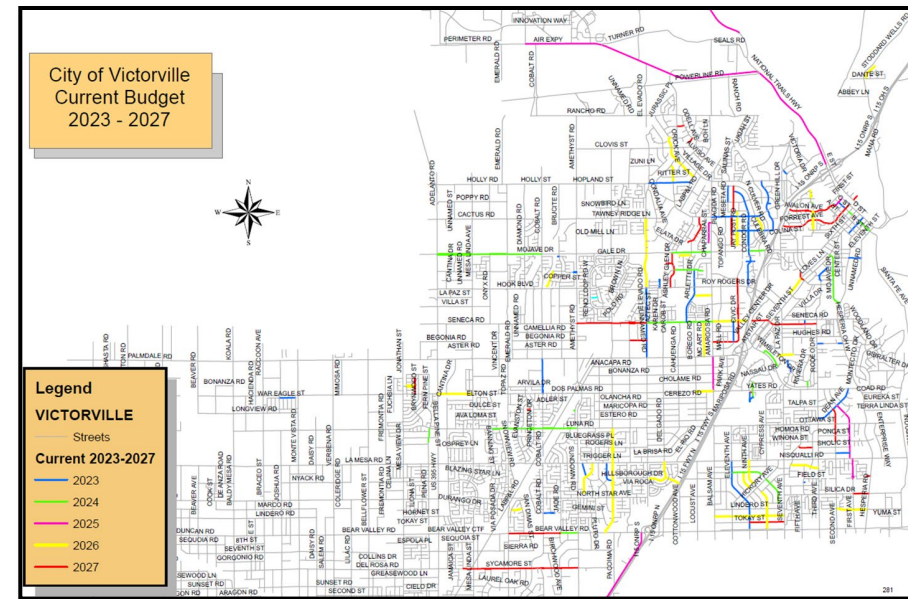
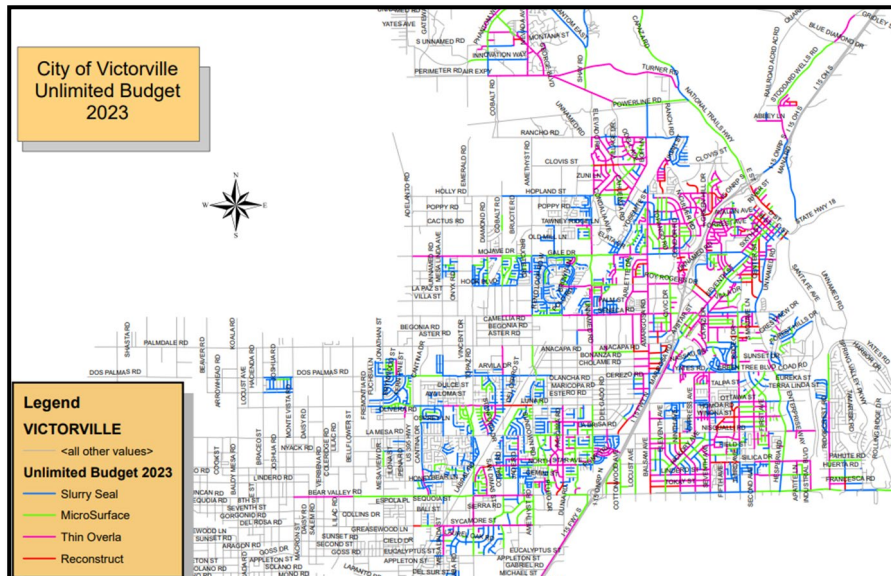
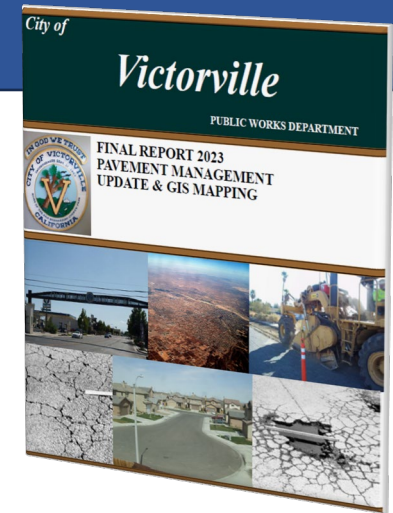
**452 centerline miles of roads and
94 million square feet of pavement**



Classification	Centerline Miles	%	Square Feet	%
Arterial	93.6	21%	27,758,540	29.5%
Collector	8.8	2%	1,652,248	1.8%
Local	343.8	76%	64,550,323	68.5%
Alleyways	5.4	1%	244,620	0.3%
Totals	451.6	100%	94,205,731	100%

Pavement Management Report (PMR)

- Prepared by consultant since 2005
- Each street condition updated every five years
- PMR includes all City maintained roads
 - Current Inventory of Roads
 - Pavement Condition
 - Rehabilitation Needs & Estimated Costs



City of Victorville – Unlimited Budget

Name	ID	To	From	Lns	Length	Width	Area	Zone	PCI Before	Maintenance	PCI After	Unit	Cost	Total
AIR EXPRESSWAY	2	E/S PHANTOM EAST	W/S VILLAGE DR	2	2585	49	126665	A	29	Thin Overlay	100	\$ 3.25	\$	411,661
AIR EXPRESSWAY	3	E/S GEORGE BL	E/S PHANTOM EAST	4	3905	61	238205	A	32	Thin Overlay	100	\$ 3.25	\$	774,166
AIR EXPRESSWAY	4	E/S PHANTOM WEST	E/S GEORGE BL	4	4925	60	295500	A	25	Thin Overlay	100	\$ 3.25	\$	960,375

Pavement Condition Index (PCI)

- Scale of 0 to 100 used
- PCI ranges relate to condition
- Visual inspection of streets
- Surface distresses identified to estimate PCI
- Types of surface distress
 - Fatigue Cracking caused by heavy trucks
 - Alligator Cracking
 - Potholes
 - Cracking caused by aging
 - Block cracking
 - Reflective cracking
 - Longitudinal and transverse cracking

PCI Range	Pavement Condition
86 –100	Excellent
71 - 85	Very Good
56 - 70	Good
41 - 55	Fair
26 - 40	Poor
11 - 25	Very Poor
0 - 10	Failed

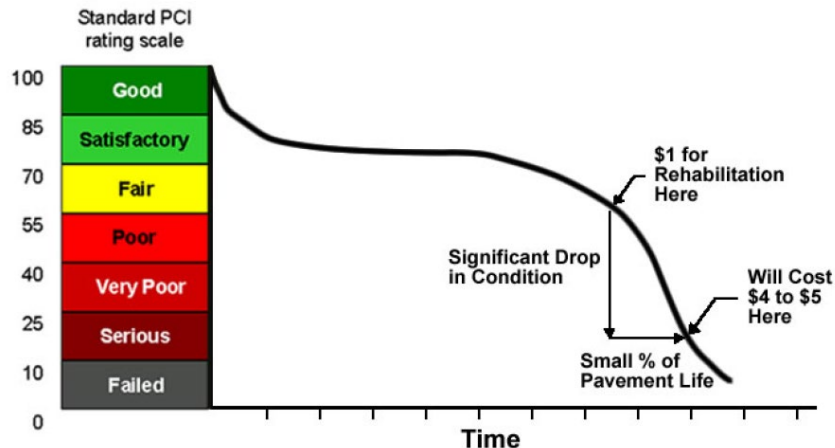


Method Used to Estimate PCI

1. City street network is identified by street segments
2. Pavement in each segment is visually inspected
3. Surface distresses (e.g. cracks and potholes) are identified
4. Severities for distresses (low, medium, or high) are identified
5. Quantity for each type of distress is estimated
6. Distress type and quantity are input into MicroPAVER software
7. Report is generated with PCI for each street segment

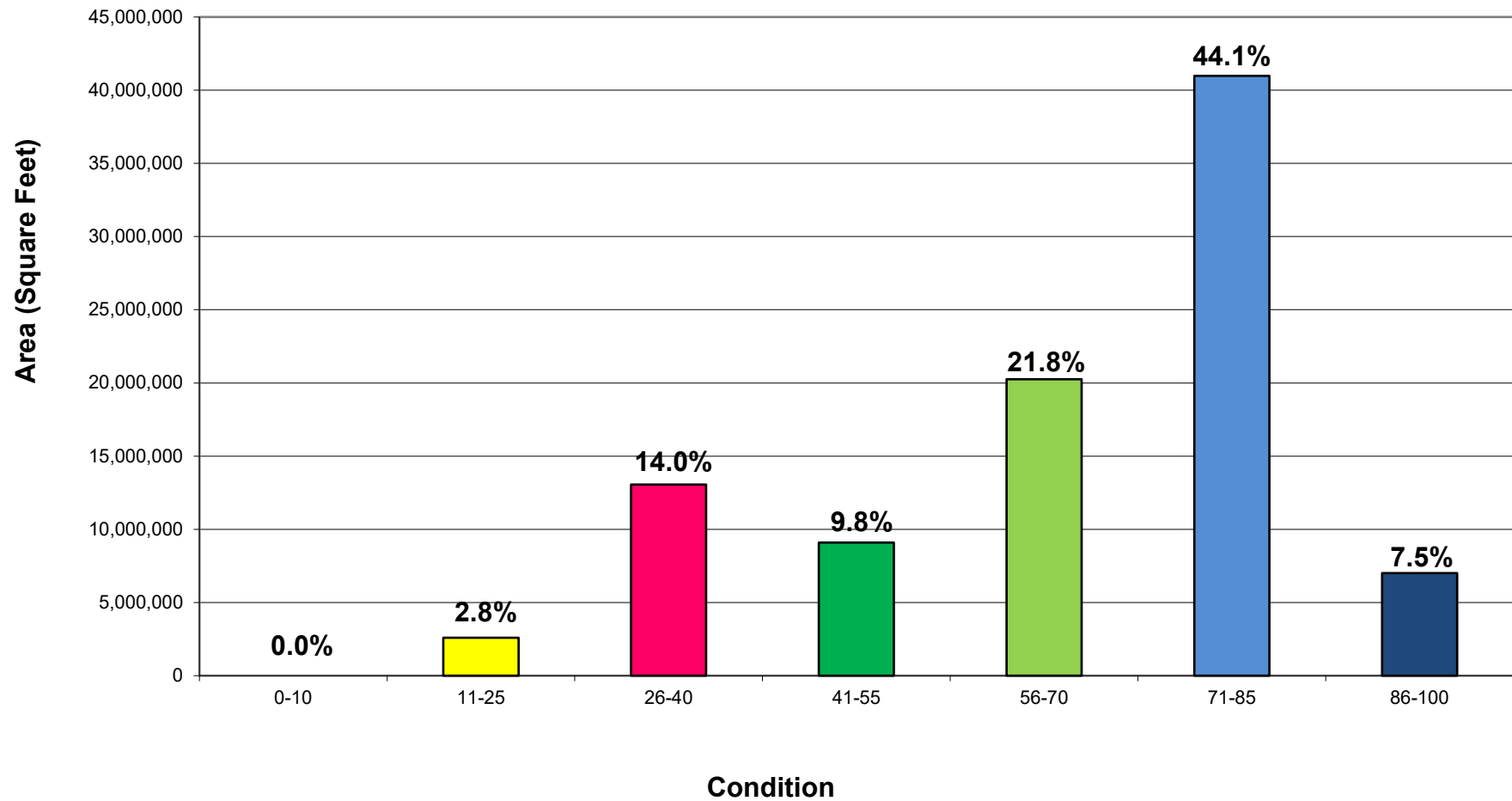
City of Victorville – PCI Report: Alphabetical

Name	ID	From	To	Length	Width	Area	Rank	Edge	Zone	PCI
A STREET	1	S/S AVALON ST	W/S THIRD ST	615	33	20,295	E	C&G	C	67
A STREET	2	E/S THIRD ST	W/S FOURTH ST	315	33	10,395	E	C&G	C	52
A STREET	3	E/S FOURTH ST	W/S FIFTH ST	325	33	10,725	E	C&G	C	69

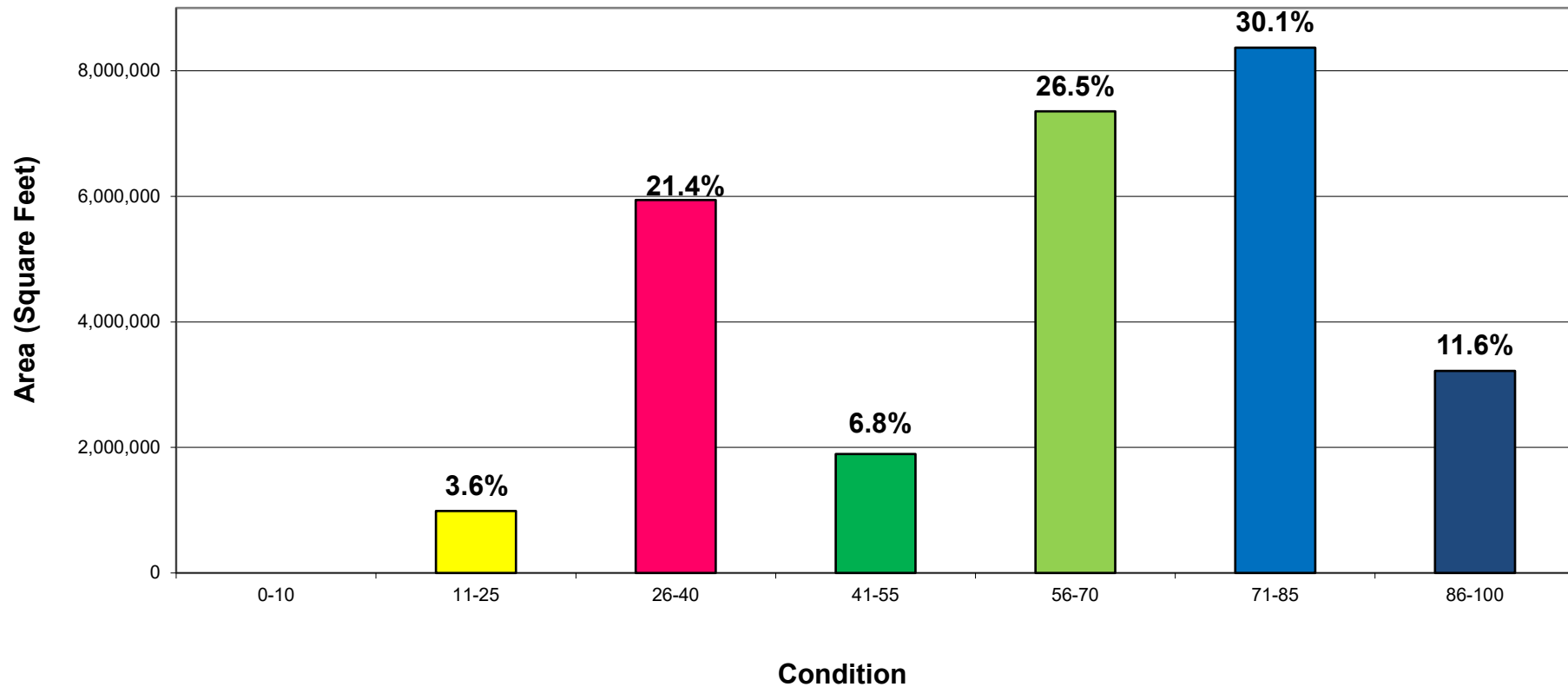


AC Streets	Critical Condition
Principal Arterial	55
Minor Arterial	55
Collector	41
Residential	41
PCC Streets	10

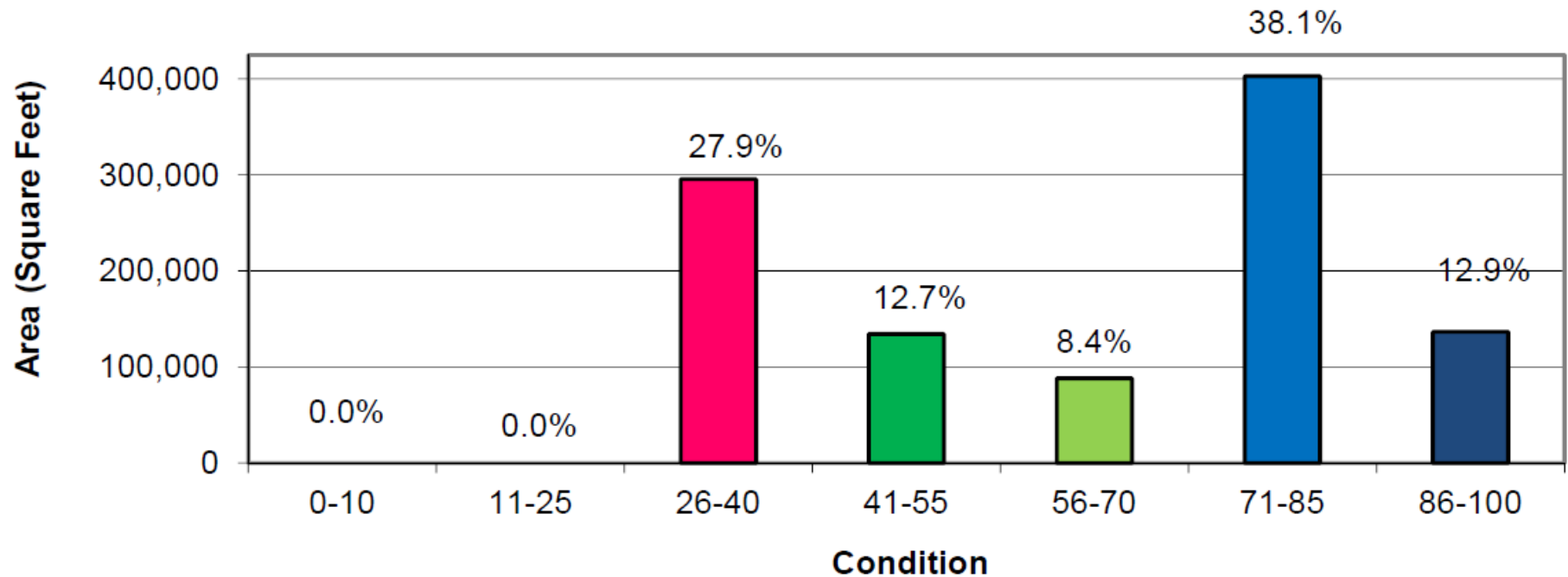
Current Pavement Conditions: All Streets



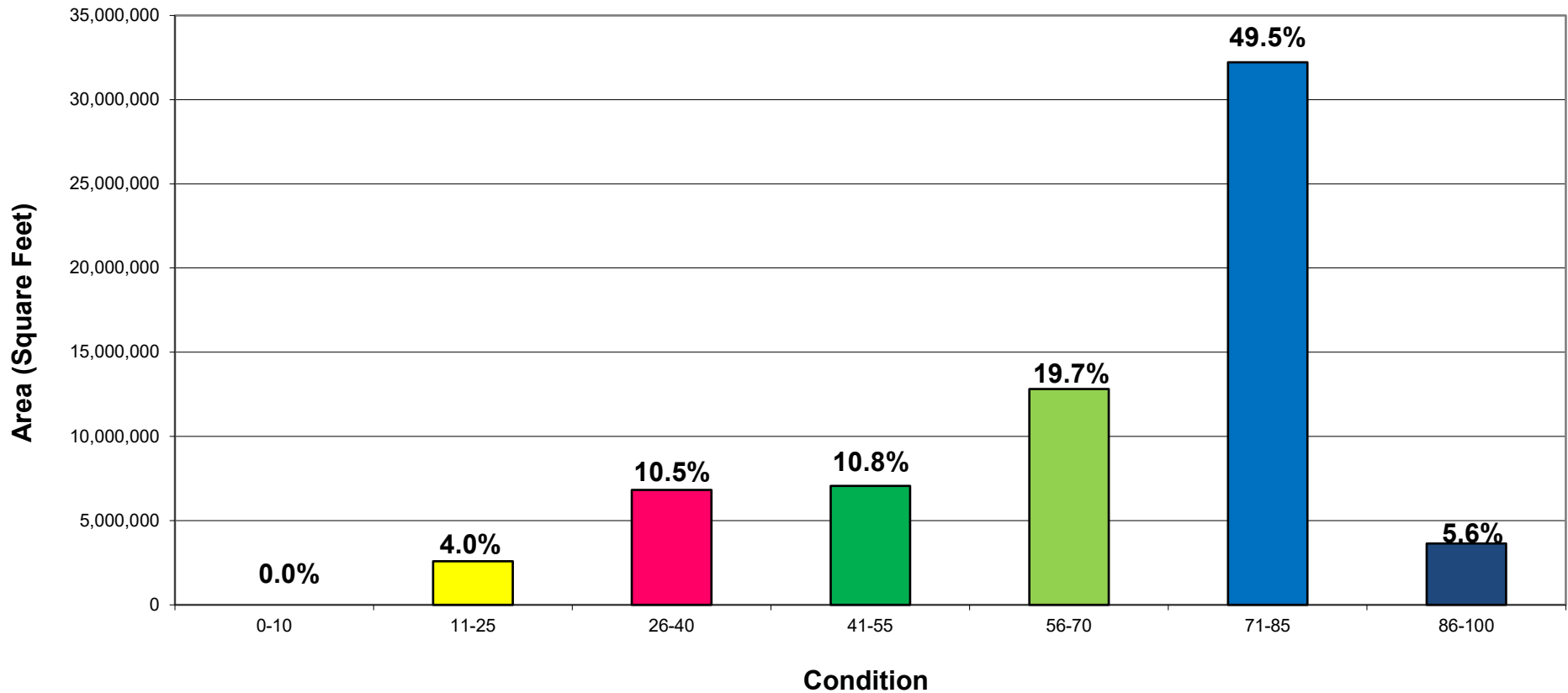
Current Pavement Conditions: Arterial Streets



Current Pavement Conditions: Collector Streets



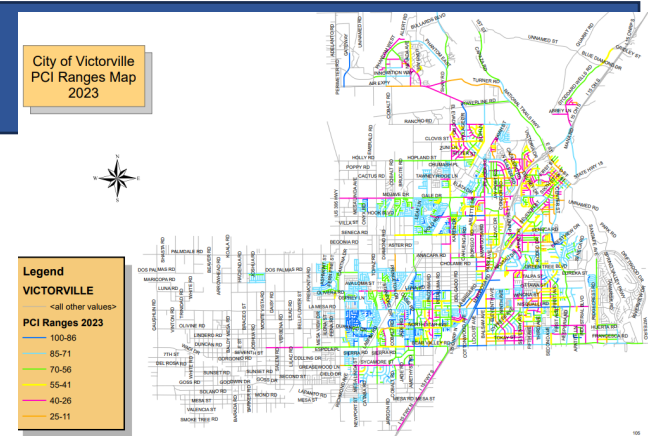
Current Pavement Conditions: Residential Streets



Rehabilitation & Preservation Methods

- Treatment methods are planned based on PCI ranges

PCI Range	Condition	Treatment Method	Extended Life (years)
86-100	Excellent	None	
71-85	Very Good	Slurry Seal	5 - 7
56-70	Good	Microsurfacing	8 - 10
41-55	Fair	2 inch AC Overlay	12 - 20
26-40	Poor	2+ Inch AC Overlay	12 - 20
11-25	Very Poor	Reconstruct	30
0-10	Failed	Reconstruct	30



- Pavement condition is evaluated in more detail during project design phase
- Two treatment methods utilized - Rehabilitation (R) & Preservation (P)
- Methods are selected & adjusted by area within a project
 - Slurry seal (P) - coating of asphalt emulsion and small aggregate (sand).
 - Microsurfacing (P) – similar to slurry seal with chemical additives such as polymer.
 - AC overlay (R) – hot mix asphalt concrete (mixture of asphalt binder, crushed rock, sand, and additives) placed as a layer on top of existing AC pavement.
 - Reconstruct (R) – complete removal of AC pavement and crushed rock base, compacting soil and replacing with new crushed rock base layers and AC pavement.

Pavement Project Needs & Funding

FY 24/25 Annual Available Funding for Pavement Projects (Million \$)			
Fund No.	Fund Name	Total Revenue	Pavement Proj.
220	Highway Users Tax	\$3.7	\$0
221	Local Streets & Roads	\$3.6	\$3.6
250	Measure I	\$7.0	\$3.9
	Total	\$14.3	\$7.5

- Unlimited Budget – \$141 million needed*
- \$7.5 million annually over 20 years insufficient
- \$10 million annually needed to maintain current overall PCI of 68.6*
- \$14 million annually would increase overall PCI to 72.9 over 10 years*
- \$19 million annually would increase overall PCI to 80.2 over 10 years*

*Estimate from 2023 PCI report

Project Prioritization

Pavement projects prioritized using information from the PMR

Local Roads

- Slurry seal / microsurfacing project identified from roads in PMR
- Project is typically in a geographic area or neighborhood (e.g. Golden Triangle)
- Cracks and potholes filled in advance of project by Public Works Staff
- Typically about \$1.6 million budgeted annually

Arterial & Collector Roads

- Benefit / Cost (B/C) Formula is used to prioritize arterial and collector roads projects
- Benefit is divided by project cost to calculate a B/C number
- The higher the B/C number, the higher the priority
- Benefit factors
 - Daily Traffic
 - Improvement in PCI
 - Extended Life of Pavement
 - Length of Project

Benefit Cost Ratio Formula

$$\frac{B}{C} = \frac{(ADT) \left(\frac{\Delta PCI}{2} \right) (T)(L)}{C}$$

Variable	Description	Unit
B	Benefit to users from the increased average PCI over the extended life of the pavement and length of the project	None
ADT	Est. Average Daily Traffic Volume	Vehicles/day
PCI	Pavement Condition Index. A number from 0 to 100.	None
$\Delta PCI / 2$	Est. Avg. PCI increase over the extended life of the pavement resulting from rehabilitation project	None
T	Est. life of pavement extended resulting from rehabilitation project	Years
L	Project Length	Mile
C	Est. Project Cost	\$

Example: Roy Rogers Dr from Civic Dr to Amargosa Rd

$$\frac{B}{C} = \frac{(26,027) \left(\frac{100-50}{2} \right) (20) \left(\frac{1,910 \text{ ft}}{5280 \text{ mi/ft}} \right)}{\$518,470} = 9.1$$

Road Name	Limit To	Limit From	Length (ft)	Width (ft)	PCI	Rehab. Method	\$ / SF
Roy Rogers Dr	Civic Dr	Amargosa Rd	1,910	61	50	2 Inch AC Overlay	\$4.45
Roy Rogers Dr	I-15 SB Ramps	Civic Dr	750	96	53	2 Inch AC Overlay	\$4.45
Roy Rogers Dr	I-15 NB Ramps	I-15 SB Ramps	1,340	72	53	2 Inch AC Overlay	\$4.45

Road Name	Limit To	Limit From	Est. Cost	PCI Increase	Extended Life	ADT	ADT Year	Benefit/ Cost Ratio	Wtd. Average B/C
Roy Rogers Dr	Civic Dr	Amargosa Rd	\$518,470	50	20	26,027	2023	9.1	8.6
Roy Rogers Dr	I-15 SB Ramps	Civic Dr	\$320,400	47	20	36,542	2023	7.6	
Roy Rogers Dr	I-15 NB Ramps	I-15 SB Ramps	\$429,336	47	20	32,850	2021	9.1	

FY 25 Five-Year Plan - Pavement Rehab Projects

	<u>Million \$</u>	<u>B/C</u>	<u>PCI</u>
• Mojave Dr (7 th St to Amargosa Rd)	\$2.8	9.2	25 to 60
• Air Expressway (National Trails Hwy to George Blvd)	\$5.6	8.3	25 to 54
• Mojave Dr (Amargosa Rd to US-395)	\$6.4	7.6	25 to 62
• Air Expressway (George Blvd to Phantom West)	\$3.1	7.3	25
• La Paz Dr (7 th St to I-15 ramps)	\$0.6	6.7	40
• Mariposa Rd (Talpa St to Kingswood Dr)	\$0.7	6.1	29 to 40
• Bear Valley Rd (US-395 to Bellflower Rd)	\$0.5	5.3	63
• Amargosa Rd (Dos Palmas Rd to Village Dr)	\$3.6	5.1	29 to 37
• El Evado Rd (Palmdale Rd to Begonia Rd)	\$1.2	4.8	25
• Hook Blvd (El Evado Rd to Aloe Rd)	\$0.8	4.7	36
• Seneca Rd (Amargosa Rd to El Evado Rd)	\$2.0	4.3	25 to 47
• Cobalt Rd (Palmdale Rd to Dos Palmas Rd)	\$1.1	3.8	25

Fiscal Year 25-30 Five - Year Plan Total Cost: **\$28 Million**

Deferred Pavement Rehabilitation Projects

	<u>Million \$</u>	<u>B/C</u>	<u>PCI</u>
• Amargosa Rd (Eucalyptus St to Avenal St)	\$1.0	6.7	29 to 32
• Balsam Rd (Bear Valley Rd to Nisqualli Rd)	\$1.9	3.9	24 to 42
• El Evado Rd (Hopland Rd to Bonanza Rd)	\$2.3	2.2	28 to 47
• Tawney Ridge Ln (El Evado Rd to Puesta Del Sol Dr)	\$2.4	0.6	24 to 36
• Luna Rd (Amethyst Rd to Mesa Linda Ave)	\$1.9	4.0	24 to 40
• Pacoima Rd (Bear Valley Rd to Luna Rd)	\$1.6	1.0	23 to 44
• Sycamore St (Amethyst Rd to US-395)	\$1.3	0.9	24 to 28
• Winona St (Hesperia Rd to Eleventh Ave)	\$1.0	0.8	20 to 44
• Northstar Ave (Petaluma Rd to San Dimas St)	\$1.0	1.6	20 to 51
• Eleventh Ave (Bear Valley Rd to Nisqualli Rd)	\$0.9	1.1	25 to 27
• Seventh St (Lorene Dr to Desert Knoll Dr)	\$0.8	5.3	53
• Other road segments	\$15.1		13 to 54
Total Arterials & Collectors	\$30.2 million (deferred)		

Deferred Pavement Preservation Projects

	<u>Millions</u>	<u>B/C</u>	<u>PCI</u>
• Amargosa Rd (Dos Palmas Rd to Luna Rd)	\$0.3	5.4	58
• Bear Valley Rd (City Limits to Industrial Blvd)	\$0.5	5.9	56 to 69
• Dos Palmas Rd (Amargosa Rd to Monte Vista Rd)	\$0.5	2.4	59 to 79
• El Evado Rd (Luna Rd to Northstar Ave)	\$0.4	2.4	62 to 69
• Hesperia Rd (Bear Valley Rd to Green Tree Blvd)	\$0.9	9.8	59 to 78
• National Trails Hwy (Air Expressway to I-15)	\$1.2	9.6	56 to 72
• Seventh St (D St to Desert Knoll)	\$0.7	5.8	55 to 64
• Other road segments not included	\$10.2		55 to 79
Total Arterials & Collectors	\$14.7 million (deferred)		

Total Pavement Rehabilitation & Preservation 2024

Today's Estimated Unlimited Budget for Pavement Projects Requiring Work

Measure I 25-30 Five-Year Plan	\$28.0 million
Arterials & Collector Rehabilitation Projects	\$30.2 million (deferred)
Arterials & Collector Preservation Projects	\$14.7 million (deferred)
Local Road Reconstruction Projects	\$24.1 million (deferred)
Local Road Rehabilitation Projects	\$55.8 million (deferred)
Local Road Preservation Projects	\$23.8 million (deferred)

Total \$176.6 million

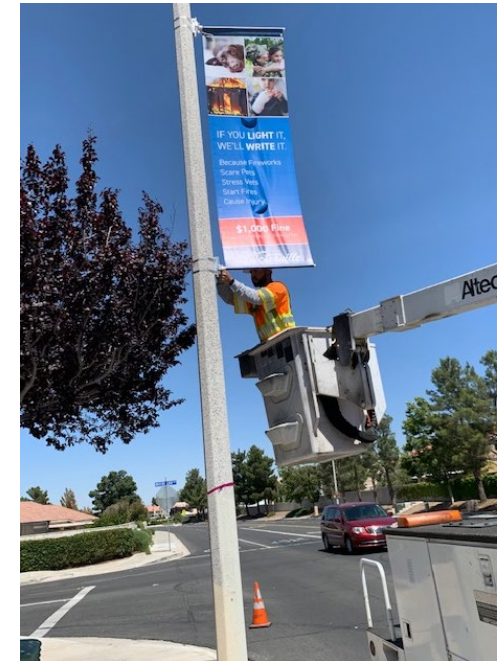
Public Works Maintenance Efforts

	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	Totals
LF of Crack Seal	145,090	223,360	199,580	130,880	100,710	799,620
Total Potholes Filled	11,694	7,714	8,389	12,658	17,367	58,272
SF of AC R&R	61,869	52,427	56,956	35,884	79,381	286,517
SF of Sidewalk R&R	31,047	20,301	19,175	14,440	14,256	99,219
SF of New Sidewalk	0	5,980	0	0	0	5,980
LF of Curb R&R	69	399	126	118	195	907
LF of Curb & Gutter R&R	359	568	25	287	850	2,089



Traffic Engineering Maintenance Efforts

	FY 19/20	FY 20/21	FY 21/22	FY 22/23	FY 23/24	Totals
Miles of Striping	100	291	285	314	569	1,559
No. of Legends Striped	2,099	466	1,194	757	1,542	6,058
LF of Red Curbs Painted	14,501	58,720	13,420	2,717	19,717	109,075
New Signs Installed	451	238	338	309	279	1,615
Signs Replaced	676	1,006	587	742	654	3,665



List of Recently Completed Projects

Steet Segment(s) or Project	Year Completed	Total Cost
Village Drive from Air Expressway to Amargosa Rd	2019	\$5.9 M
Third Avenue from Green Tree Blvd to Nisqualli Rd	2020	\$1.3 M
Industrial/Silica from Bear Valley Rd to Hesperia Rd	2021	\$4.6M
7 th Street/Arrowhead Drive from Green Tree Blvd to Bear Valley Rd	2022	\$7.3M
Green Tree Extension*	2023	\$47.7
Bear Valley Rd from Ridgecrest Rd to Industrial Rd*	2023	\$11.9
Liberty Village Slurry Seal Project	2022	\$1.3M
Civic Area Slurry Seal Project	2024	\$1.8M
Bear Valley Road from Amethyst Rd to Highway 395	2024	\$7.8M
Total Capital Investment in Street Improvement Projects		\$89.6 M

*Project costs include bridge construction/widening