



9th International Conference on
MANAGING PAVEMENT ASSETS (ICMPA9)

Going Beyond MAP-21 Performance Targets

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Metropolitan Transportation Commission



Why is it Important?

MAP-21 Requirements Focus on:

- **Performance**
- **Accountability**
- **Transparency**

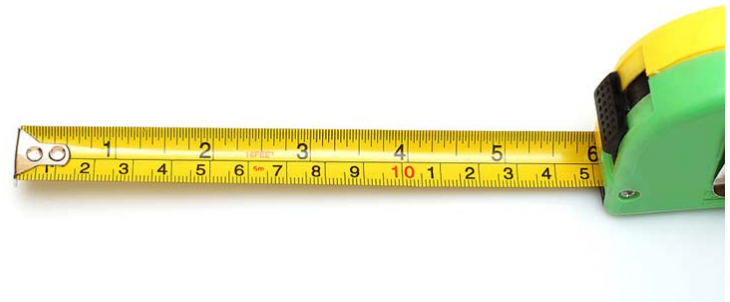


From **Small Business** to **Fortune 500** :

How is **Success** being measured?



SUCCESS





Profit Margin
= 80%

Year to Year
Sales = 200%

Food Spoilage
= 2%

Proposed Performance Metrics

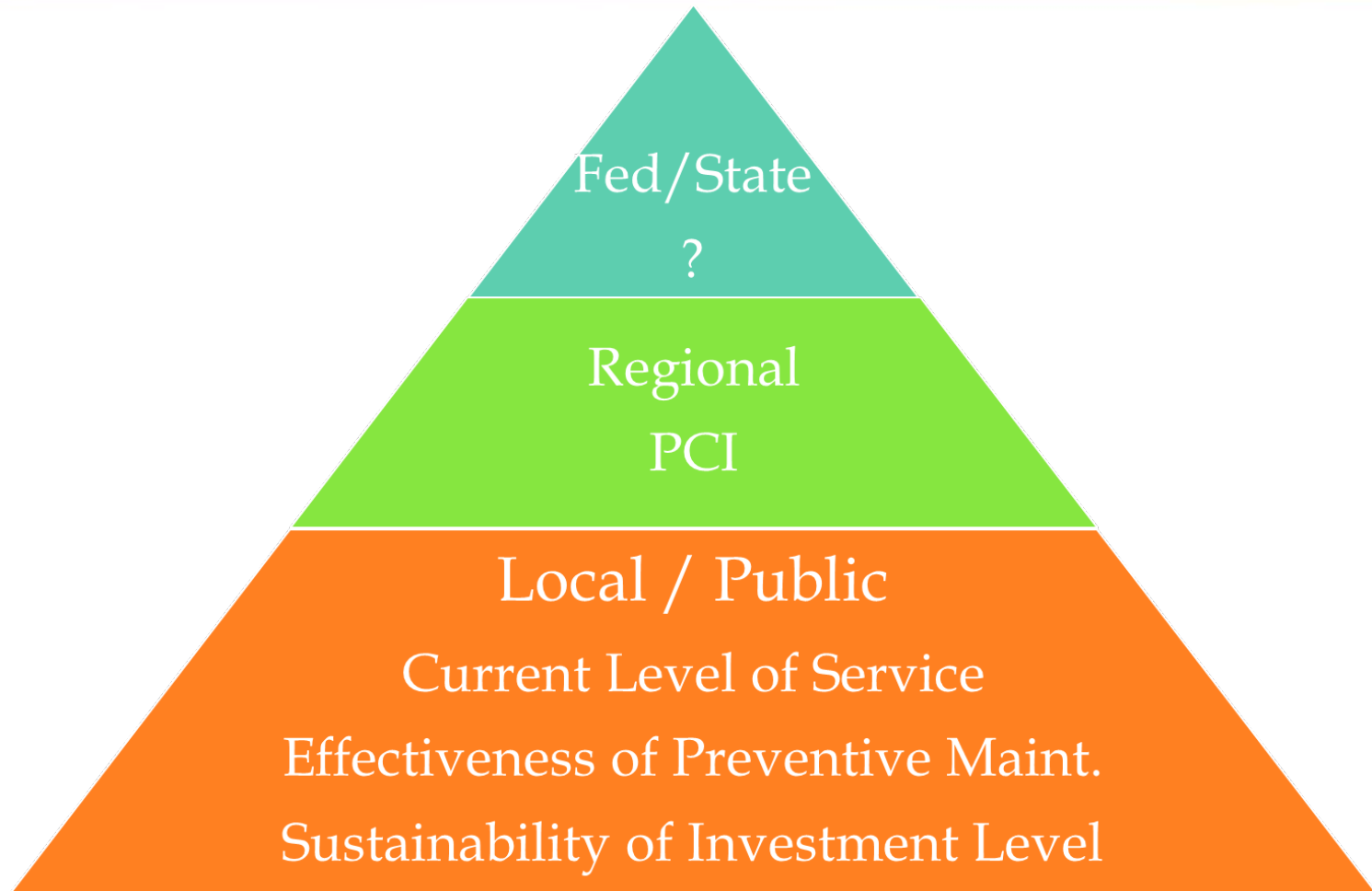
Metric	Surface Type	Condition	Range
IRI	All	Good	< 95 in/mi
		Fair	95-170 (Pop <1 million)
			95-220 (Pop >1 million)
		Poor	> 170 (Pop <1 million)
			> 220 (Pop >1 million)
Cracking_%	All	Good	< 5%
		Fair	5-10%
		Poor	> 10%
Rutting	Flexible	Good	< 0.20 in
		Fair	0.20-0.40 in
		Poor	> 0.40 in
Faulting	Rigid	Good	< 0.05 in
		Fair	0.05-0.15 in
		Poor	> 0.15 in

Key Performance Indicators

Keys Questions on Asset Management Plan:

- **Existing condition?**
- **Maintenance \$ currently invested?**
- **Maintenance \$ for SGR?**
- **Effectiveness of pavement preservation?**

Level of Performance Metrics



“One Size Fits All”?



No Two Alike



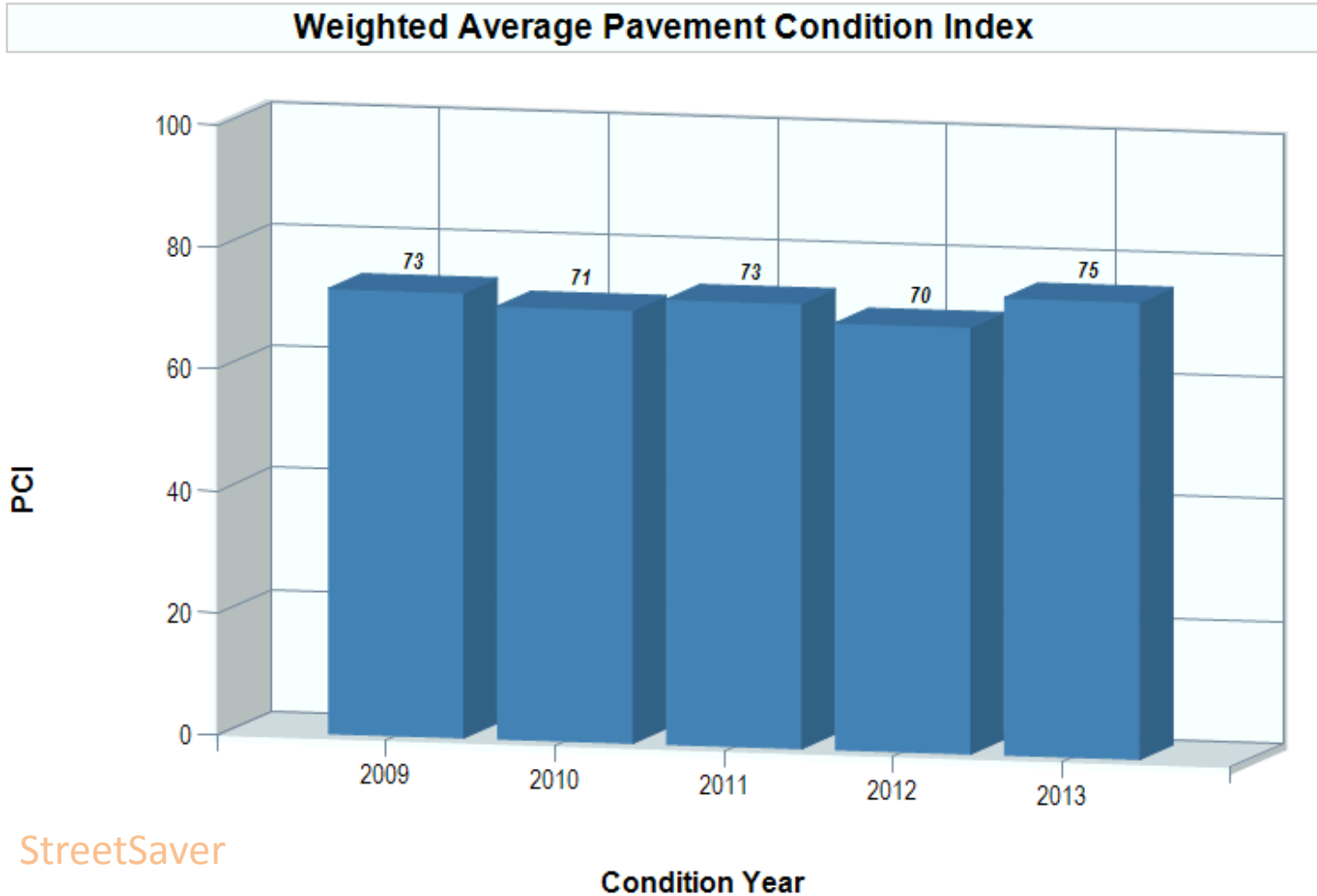
“You must define and interpret your KPIs based on your goals and objectives.”

Guiding Principles

- **Measurable**
- **As objective as possible**
- **Can be fairly applied**
- **Utilize data widely available**
- **Meaningful (e.g. promotes pavement preservation)**

Performance Measure

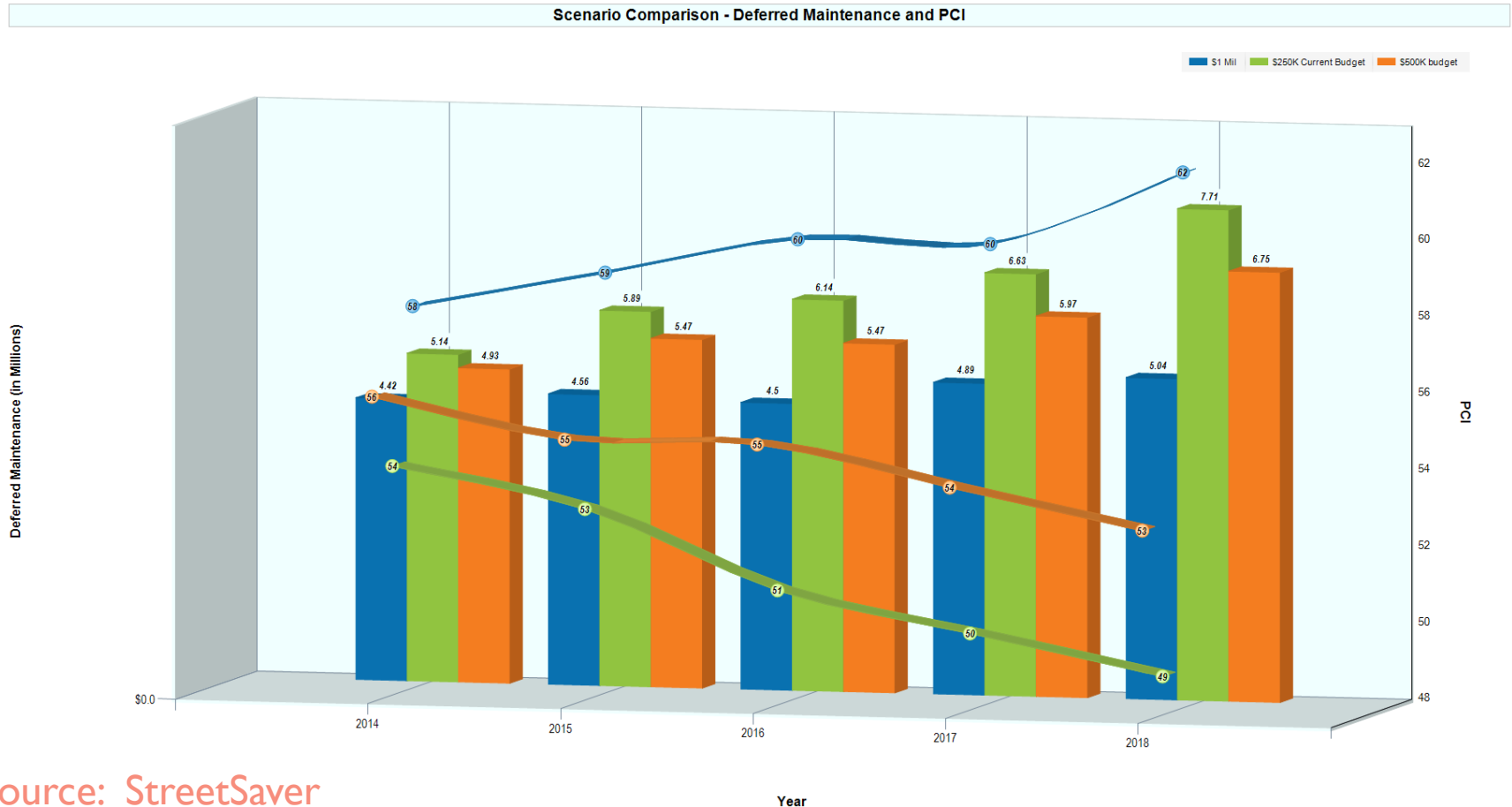
Pavement Condition Index (PCI)



Source: StreetSaver

Performance Measure

PCI vs Deferred Maintenance

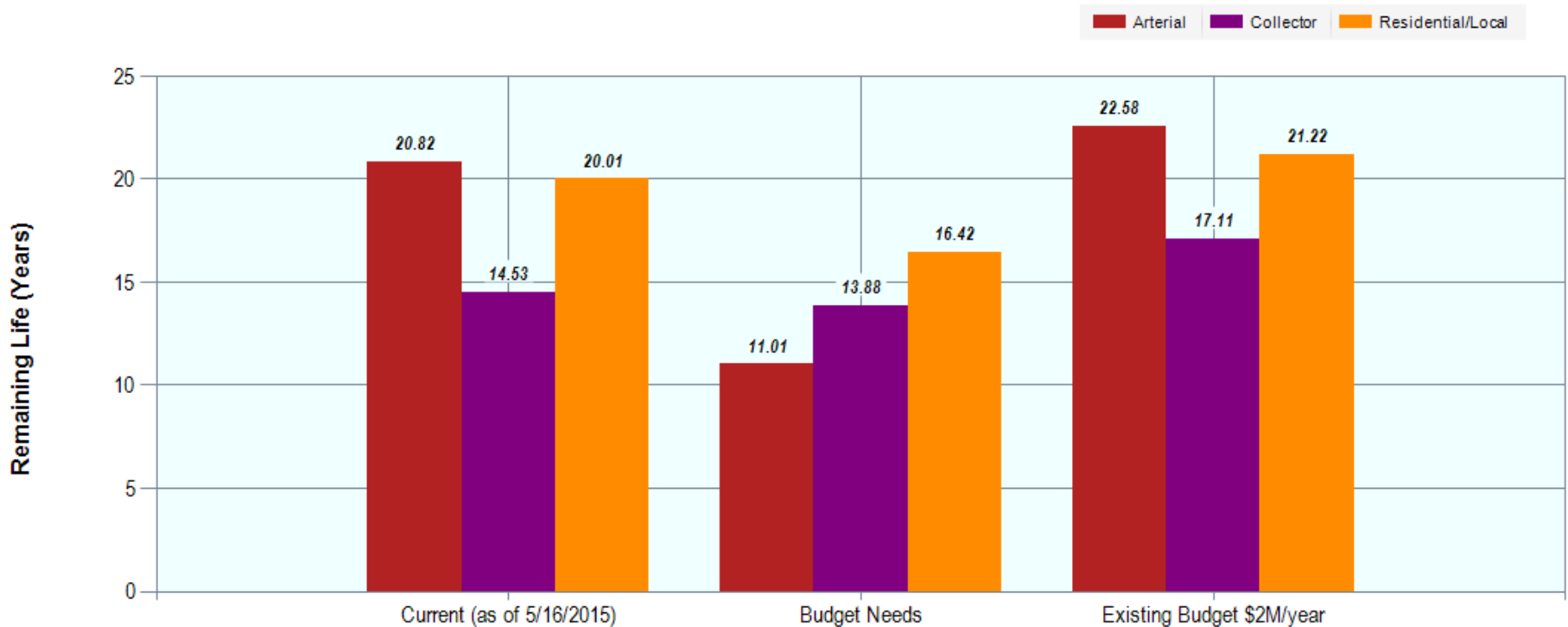


Source: StreetSaver

Performance Measure

Remaining Service Life (RSL)

Remaining Life Changes under Budget Scenarios as of 2020

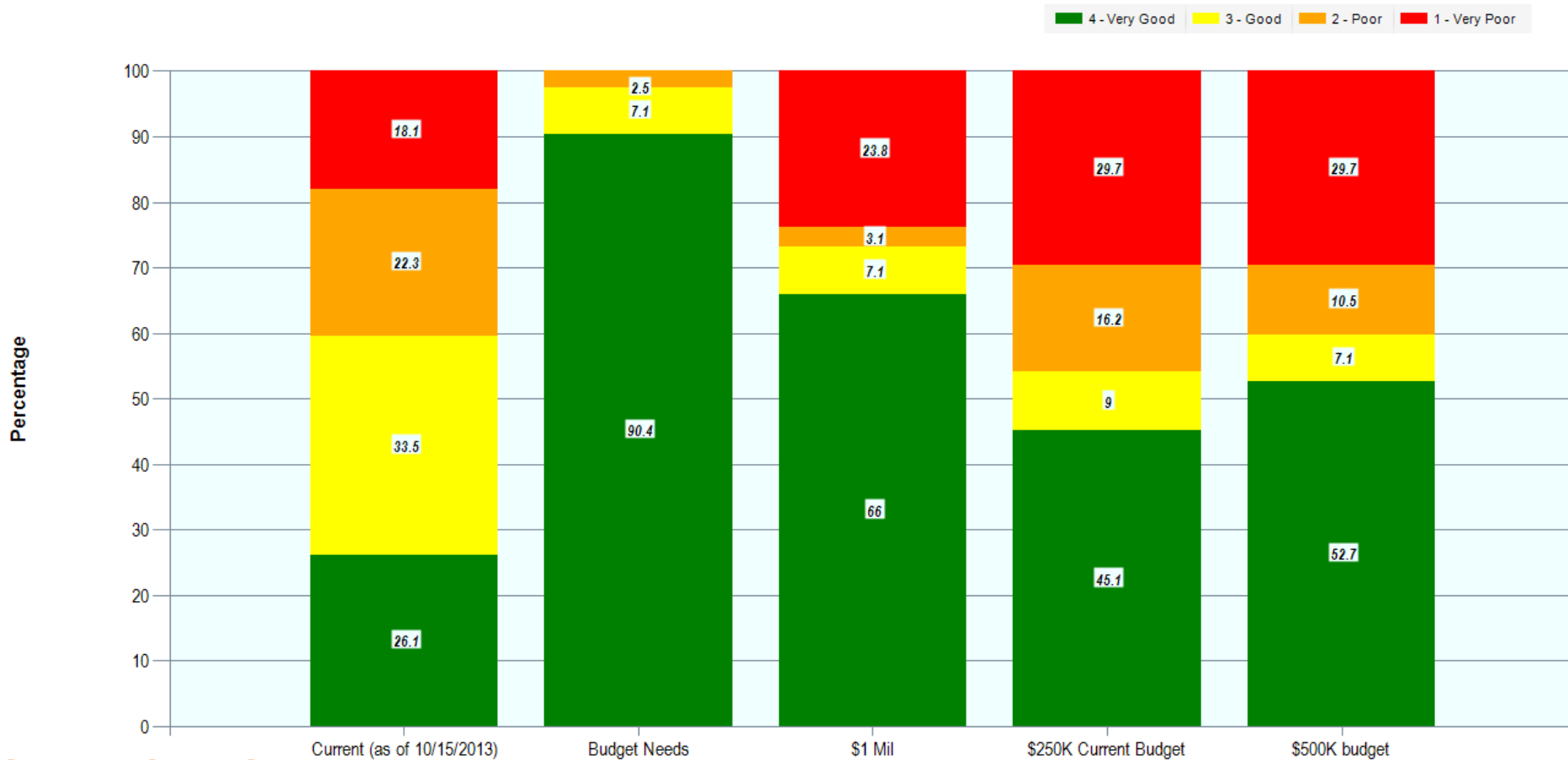


Source: StreetSaver

Performance Measure

Min % Poor / Max % Good

Pavement Condition Changes under Budget Scenarios as of 2018



Source: StreetSaver

KPI:

% Poor or Failed; % of Very Good or Better
Network PCI, 3-yr Moving Avg PCI

Current Level of Service												
County	Jurisdiction	Total Lane Miles	Total CL Miles	% Poor or Failed	% Very Good or Better	2012 PCI				3-yr Moving Average		
						Art	Coll	Res	NET	2010	2011	2012
	Regional Benchmarks (weighted)	42,788	20,634	24%	31%	73	66	63	66	66	66	66
ALA	ALAMEDA	303.9	137.8	22%	29%	70	72	62	66	66	67	68
	ALAMEDA CO.	990.3	471.8	9%	16%	71	73	71	71	72	73	71
	ALBANY	59.1	29.4	36%	20%	64	60	54	58	60	58	57
	BERKELEY	452.8	216.2	38%	28%	70	50	58	58	60	59	59
	DUBLIN	254.0	116.0	0%	84%	88	85	88	87	82	84	86
	EMERYVILLE	47.1	19.8	5%	51%	77	75	70	75	77	78	78
	FREMONT	1064.9	496.9	30%	31%	73	61	57	63	64	63	63

KPI:

$$\text{Pavement Preservation Index (PPI)} = \frac{\text{Actual PM \%}}{\text{Recommended PM\%}}$$

County	Jurisdiction	Network PCI	\$PM/% Actual Lane Mile	% PM	% PM Needs	Pavement Preservation Index
	Regional Benchmarks	66	\$ 1,336	17%	16%	1.06
Alameda	ALAMEDA	66	\$ 1,271	13%	15%	0.88
	ALAMEDA CO.	71	\$ 671	18%	28%	0.67
	ALBANY	58	\$ 1,247	10%	13%	0.78
	BERKELEY	58	\$ 263	2%	11%	0.20
	DUBLIN	87	\$ 3,124	50%	79%	0.62
	EMERYVILLE	75	\$ 48	100%	35%	2.87
	FREMONT	63	\$ 5,140	43%	16%	2.76

KPI:

Sustainability Index =

$$\frac{\text{Actual M\&R}}{\text{Annualized 10-Year Needs}}$$

County	Jurisdiction	Network PCI	Actual M&R /Lane Mile	Needs/Lane Mile	Sustainability Index
	Regional Benchmarks	66	\$10,400	\$27,000	39%
Alameda	ALAMEDA	66	\$9,800	\$26,900	36%
	ALAMEDA COUNTY	71	\$3,600	\$16,200	22%
	ALBANY	58	\$12,700	\$29,800	43%
	BERKELEY	58	\$11,600	\$32,400	36%
	DUBLIN	87	\$6,300	\$5,600	113%
	EMERYVILLE	75	\$0	\$16,100	0%
	FREMONT	63	\$11,900	\$29,100	41%
	HAYWARD	69	\$14,000	\$22,600	62%
	LIVERMORE	76	\$5,800	\$15,000	39%

KPI:

Backlog over Asset Value = $\frac{\text{Current Backlog}}{\text{Network Asset}}$

County	Jurisdiction	Network PCI	Current Backlog (millions)	Network Asset Value (millions)	Backlog/Asset Value
	Regional Benchmarks	66	\$5,645	\$38,814	15%
Alameda	ALAMEDA	66	\$32	\$229	14%
	ALAMEDA COUNTY	71	\$55	\$647	8%
	ALBANY	58	\$9	\$41	22%
	BERKELEY	58	\$77	\$298	26%
	DUBLIN	87	\$4	\$180	2%
	EMERYVILLE	75	\$3	\$37	7%
	FREMONT	63	\$131	\$805	16%
	HAYWARD	69	\$59	\$473	12%
	LIVERMORE	76	\$40	\$516	8%

Action

Look Beyond PCI
or IRI...

Questions?

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