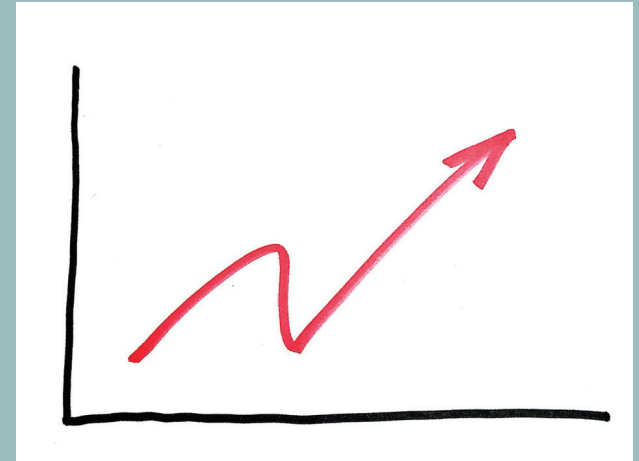


# OUTCOME-DRIVEN PERFORMANCE MANAGEMENT



Sui Tan, PE  
Metropolitan Transportation  
Commission



# SAN FRANCISCO METROPOLITAN REGION

POPULATION = 7.5 MILLION

9 COUNTIES

100 CITIES

43,500 LANE-MILES OF LOCAL STREETS & ROADS

6,850 LANE-MILES OF STATE HIGHWAY (CALTRANS)

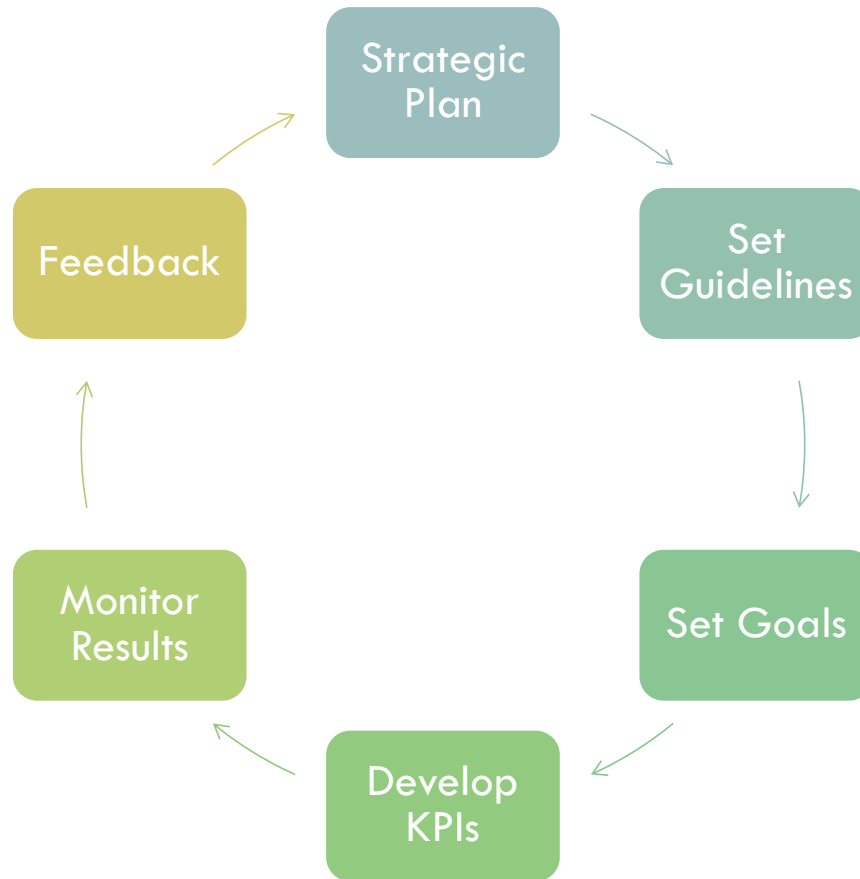
25 TRANSIT AGENCIES

7 TOLL BRIDGES

One MPO -

Metropolitan Transportation  
Commission

# WHAT IS PERFORMANCE MANAGEMENT?



# WHY IS IT IMPORTANT?

- Federal Requirements
  - ✓ MAP-21 & FAST Act
  - ✓ Set Performance Targets for Non-State NHS
- Yes, but what's in it for me?

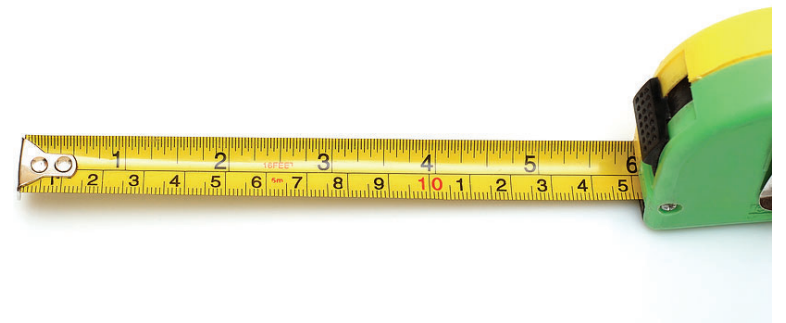
Funding



# From Small Business to Fortune 500 : How is Success being measured?



**SUCCESS**





Profit Margin  
= 80%

Year to Year  
Sales = 200%

Food Spoilage  
= 2%

# GUIDING PRINCIPLES

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

# TYPES OF PERFORMANCE INDICATOR

## Leading Indicator

Activities you must undertake to achieve the desired outcome

## Lagging Indicator

“output” oriented, easy to measure but hard to improve

### My Daily Food Plan SAMPLE

Based on the information you provided, this is your daily recommended amount for each food group.

GRAINS 9 ounces	VEGETABLES 3 1/2 cups	FRUITS 2 cups	DAIRY 3 cups	PROTEIN FOODS 6 1/2 ounces
<b>Make half your grains whole</b> Aim for at least <b>4 1/2 ounces</b> of whole grains a day	<b>Vary your veggies</b> Aim for these amounts <b>each week:</b> Dark green veggies = 2 1/2 cups Red & orange veggies = 7 cups Beans & peas = 2 1/2 cups Starchy veggies = 7 cups Other veggies = 5 1/2 cups	<b>Focus on fruits</b> Eat a variety of fruit. Choose whole or cut-up fruits more often than fruit juice.	<b>Get your calcium-rich foods</b> Drink fat-free or low-fat (1%) milk, for the same amount of calcium and other nutrients as whole milk, but less fat and Calories. Select fat-free or low-fat yogurt and cheese, or try calcium-fortified soy products.	<b>Go lean with protein foods</b> Twice a week, make seafood the protein on your plate. Vary your protein routine—choose beans, peas, nuts, and seeds more often. Keep meat and poultry portions small and lean.
<b>Find your balance between food and physical activity</b> Be physically active for at least <b>150 minutes</b> each week.		<b>Know your limits on fats, sugars, and sodium</b> Your allowance for oils is <b>8 teaspoons</b> a day. Limit Calories from solid fats and added sugars to <b>360 Calories</b> a day. Reduce sodium intake to less than <b>2300 mg</b> a day.		

Your results are based on a 2600 Calorie pattern. Name: \_\_\_\_\_

This Calorie level is only an estimate of your needs. Monitor your body weight to see if you need to adjust your Calorie intake.

VS





# PERFORMANCE INDICATORS

**Leading Indicator**

**Lagging Indicator**

**PCI**

**IRI**

Detect low severity  
cracks early

Will only detect  
cracks when they are  
sizable

# PERFORMANCE INDICATORS

**Qualitative**

**Quantitative**

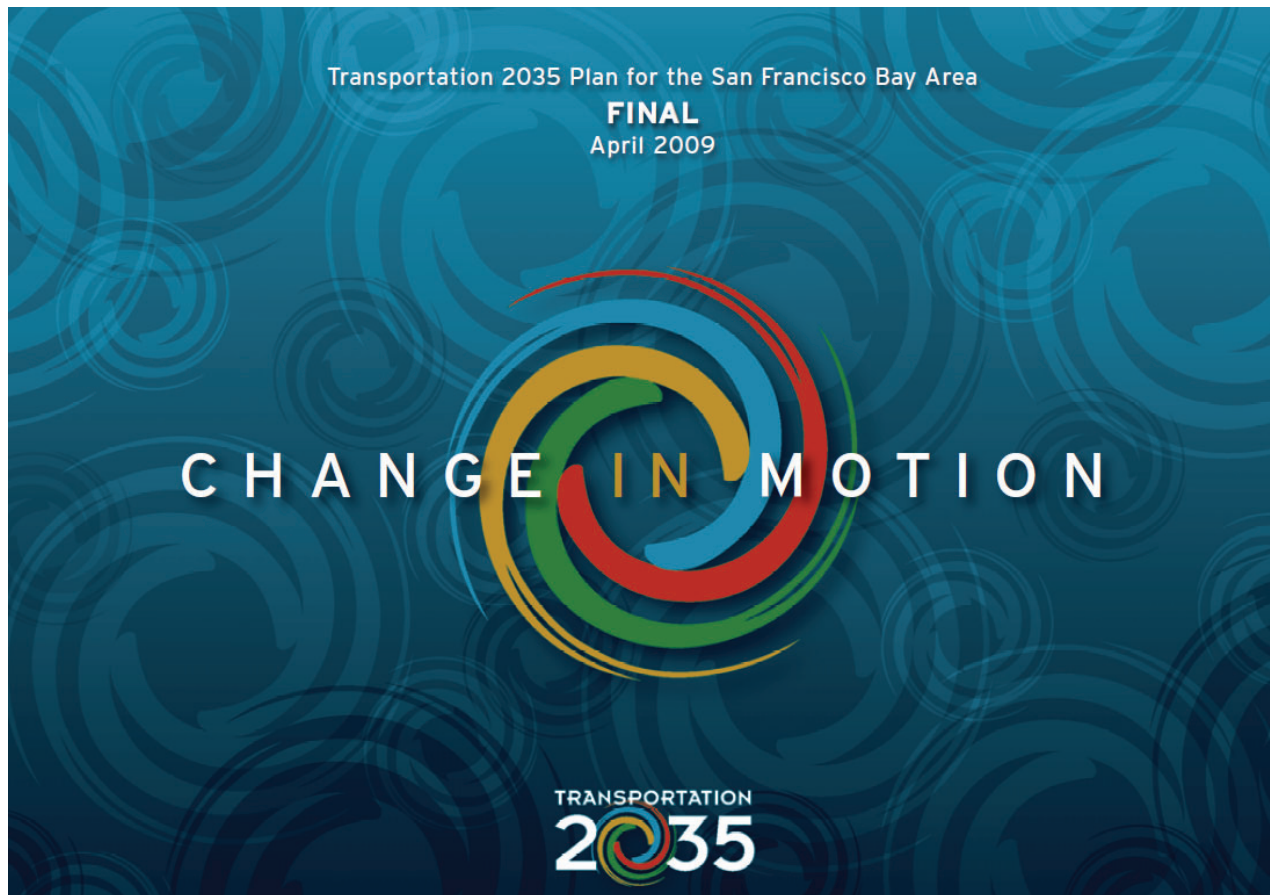
**What is the outcome?**

**Provides insights and understanding of an issue**

**What is the amount?**

**Can be computed and measured**

# REGIONAL TRANSPORTATION PLAN (RTP)



# LOCAL STREETS & ROADS NEEDS ASSESSMENT:

- Answer how much we need to invest as a region for
  - ✓ Pavement
  - ✓ Non-Pavement
  - ✓ Local Bridges
- Facilitate Regional Transportation Plan (RTP) discussion and funding policies
- Exclusive use of a common PMS by All Bay Area jurisdictions
  - StreetSaver

# 30-YEAR NEEDS ASSESSMENT

(\$ in millions)

County	Avail. Revenues	Pavement Needs	Non-Pavement Needs	Total Capital Needs	Total Remaining Capital Needs
Alameda	\$ 2,148	\$ 3,715	\$ 4,082	\$ 7,798	\$ 5,650
Contra Costa	\$ 2,915	\$ 3,111	\$ 2,674	\$ 5,786	\$ 2,871
Marin	\$ 655	\$ 865	\$ 641	\$ 1,506	\$ 852
Napa	\$ 219	\$ 1,087	\$ 429	\$ 1,516	\$ 1,297
San Francisco	\$ 2,299	\$ 2,416	\$ 2,363	\$ 4,778	\$ 2,480
San Mateo	\$ 1,440	\$ 1,929	\$ 1,984	\$ 3,913	\$ 2,473
Santa Clara	\$ 3,374	\$ 5,776	\$ 5,118	\$10,894	\$ 7,520
Solano	\$ 488	\$ 1,906	\$ 1,289	\$ 3,195	\$ 2,707
Sonoma	\$ 994	\$ 3,699	\$ 1,319	\$ 5,018	\$ 4,023
<b>REGION</b>	<b>\$14,500</b>	<b>\$24,500</b>	<b>\$20,000</b>	<b>\$44,500</b>	<b>\$30,000</b>

# REGIONAL INVESTMENT POLICY

## Performance-based planning approach

### Keep Our System in a State of Good Repair

Our transit and roadway systems are an integral part of the Bay Area's transportation network and represent a huge investment of public resources. This plan not only reaffirms the region's long-standing "fix it first" maintenance policy but also expands our commitment to maintaining and operating our existing local roadway and transit systems. The Transportation 2035 Plan directs \$7 billion in discretionary funds to maintain local roadways at current pavement conditions, and \$6.4 billion to close funding shortfalls for the highest-rated transit assets.

“...long-standing  
“fix it first”  
maintenance  
policy...”

## Transportation 2035 Performance Objectives

### Three Es

#### Economy

Reduce per-capita delay by 20 percent from today by 2035

#### Improve Maintenance

• Maintain pavement condition index (PCI) of 75 or greater for local streets and roads

• Distressed pavement condition lane miles not to exceed 10 percent of total state highway system

• Achieve an average age for all transit asset types that is no more than 50 percent of their useful life

• Increase the average number of miles between service calls for transit service in the region to 8,000 miles

#### Reduce Collisions/Fatalities

• Reduce fatalities from motor vehicle collisions by 15 percent from today by 2035

• Reduce bicycle and pedestrian *fatalities* attributed to motor vehicle collisions by 25 percent (each) from 2000 by 2035

• Reduce bicycle and pedestrian *injuries* attributed to motor vehicle collisions by 25 percent (each) from 2000 by 2035

#### Improve Regional Transportation Emergency Preparedness

• Conduct regional transportation exercise that tests emergency response and coordination capabilities for special needs populations

• Improve the seismic safety of high-priority transportation facilities

• Increase the number of transportation agency employees trained in security/emergency awareness protocols

#### Reduce Vulnerability to Transportation Security Threats

• Increase the number of transportation agency employees trained in security/emergency awareness protocols

• Enhance or install critical infrastructure detection equipment on high-priority transportation facilities

#### Environment

Reduce daily per-capita vehicle miles traveled (VMT) by 10 percent from today by 2035

#### Reduce Emissions

• Reduce emissions of fine particulates (PM<sub>2.5</sub>) by 10 percent from today by 2035

• Reduce emissions of coarse particulates (PM<sub>10</sub>) by 45 percent from today by 2035

• Reduce carbon dioxide (CO<sub>2</sub>) emissions to 40 percent below 1990 levels by 2035

#### Equity

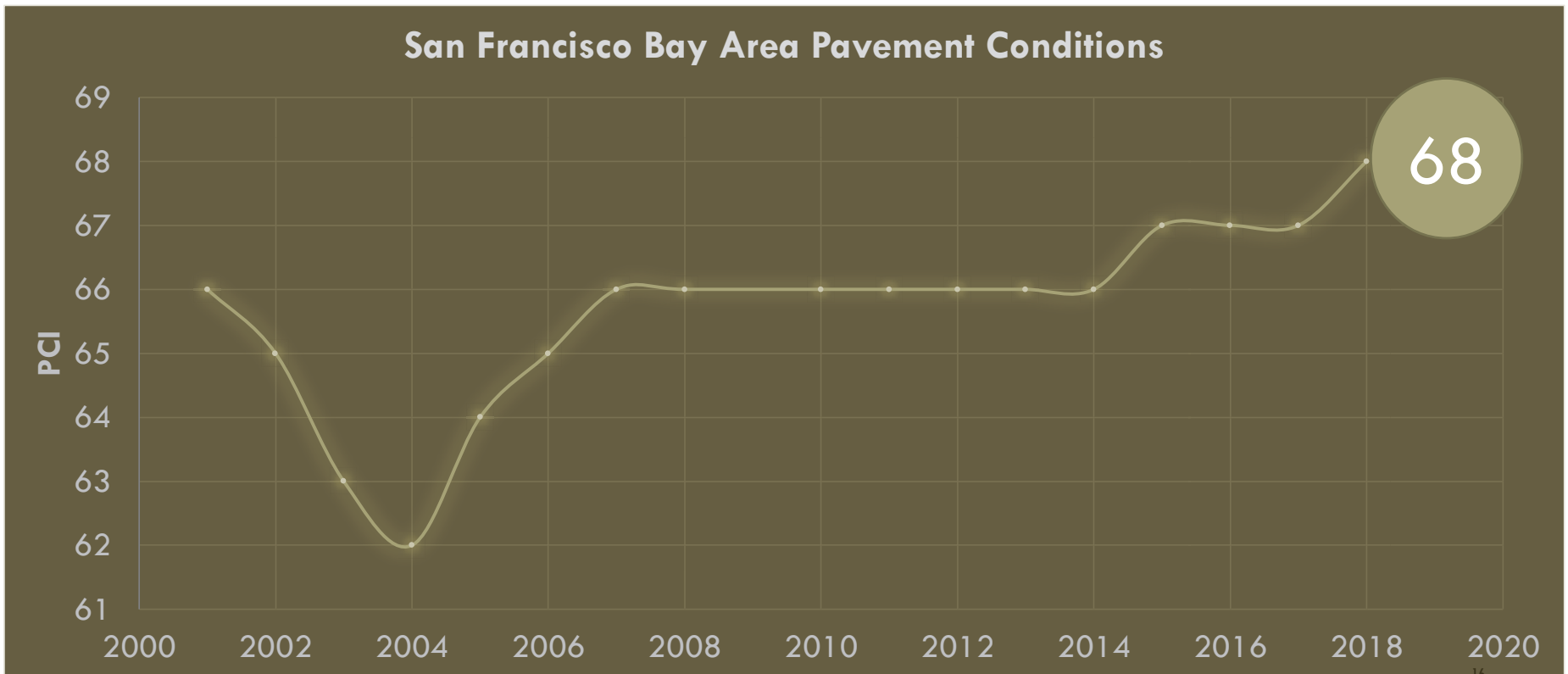
Decrease by 10 percent the combined share of low-income and lower-middle-income residents' household income consumed by transportation and housing

## Long Range Regional Transportation Plan 2035

### For Local Streets & Roads:

State of Good Repair (SGR)  
Performance Target:  
PCI = 75

# BAY AREA LOCAL STREET AND ROAD CONDITIONS





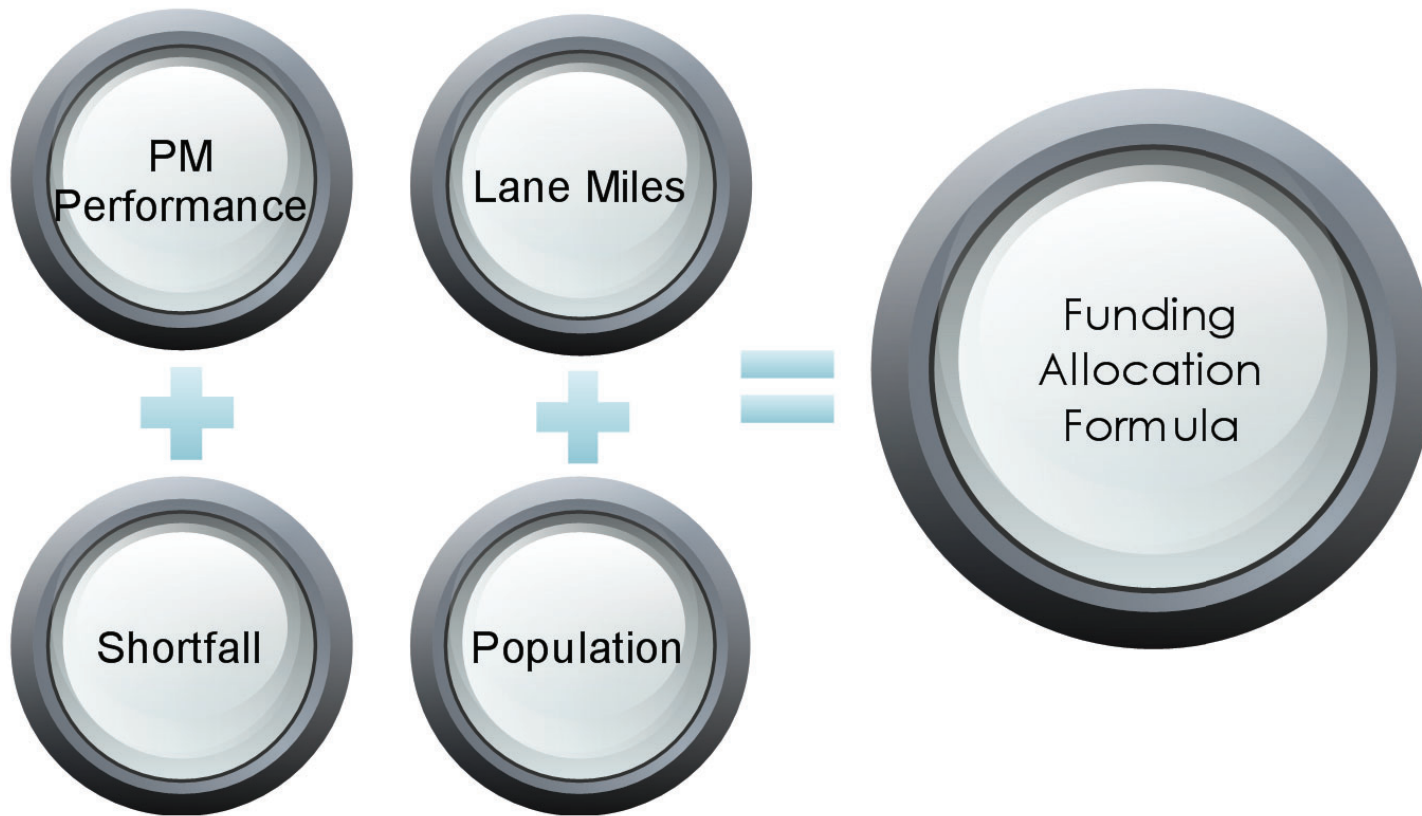
# OUTCOME-DRIVEN PERFORMANCE MEASURE

- Easy to compute formula
- No advantage or disadvantage due to age of network, current PCI or annual budget size
- Data extracted from PMS databases
- Promotes pavement preservation principles
- Replaces “Maintenance of Effort”



Shifts from “Worst First” to pavement preservation

# PERFORMANCE-BASED FUNDING ALLOCATION



# KPI: PAVEMENT PRESERVATION INDEX

What is the effort toward pavement preservation?

$$\text{PPI} = \text{Actual PM \%} / \text{Recommended PM \%}$$

County	Jurisdiction	Network PCI	\$PM/ Lane Mile	Actual PM%	Recom'd PM%	Pavement Preservation Index
	<b>Regional Benchmark</b>	<b>68</b>	<b>\$1,336</b>	<b>17%</b>	<b>16%</b>	<b>1.06</b>
Alameda	ALAMEDA	66	\$1,271	13%	15%	0.88
	ALAMEDA COUNTY	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: ASSET SUSTAINABILITY INDEX

Is the pavement asset sustainable?

$$ASI = \text{Actual M\&R} / \text{Annualized 10-Year Needs}$$

County	Jurisdiction	Network PCI	Actual M&R /Lane Mile	Needs /Lane Mile	Asset Sustainability Index
	<b>Regional Benchmark</b>	<b>68</b>	<b>\$10,400</b>	<b>\$27,000</b>	<b>39%</b>
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%

# KPI: BACKLOG OVER ASSET VALUE

How much effort is needed to reach the state of good repair?

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

County	Jurisdiction	Network PCI	Current Backlog (millions)	Network Asset Value (millions)	Backlog/Asset Value
	<b>Regional Benchmark</b>	<b>68</b>	<b>\$5,645</b>	<b>\$38,814</b>	<b>15%</b>
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%

# KPI: % GOOD, % POOR CONDITION, NETWORK PCI

How is the street network performing?

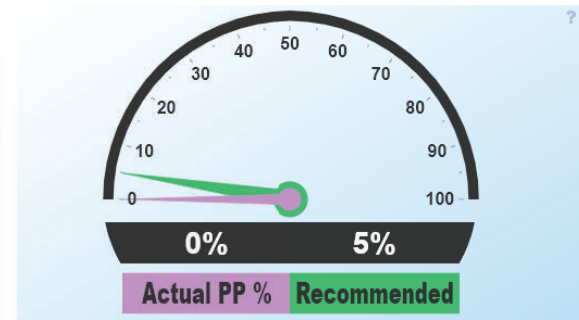
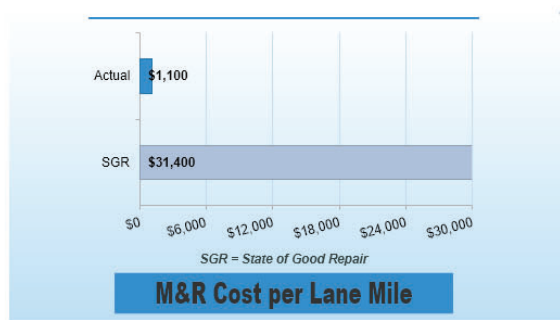
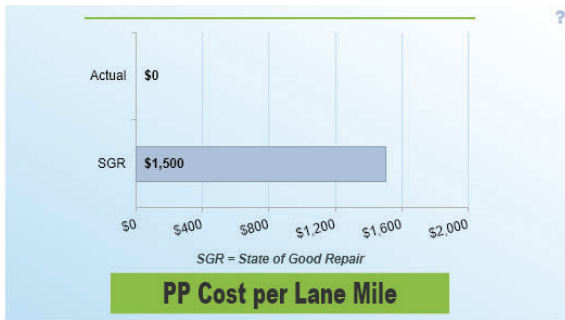
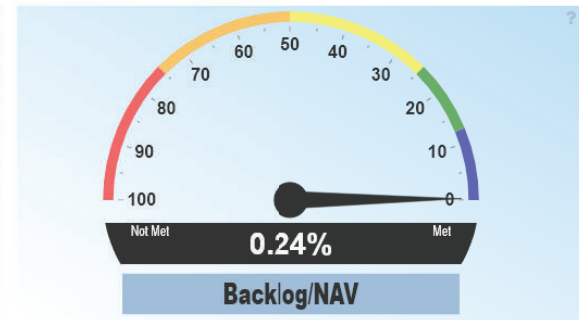
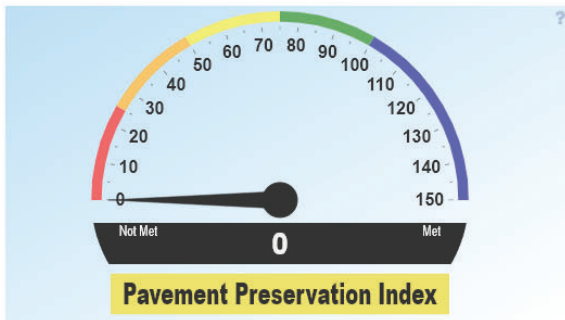
Current Level of Service by County and Jurisdiction													
	Total Lane Miles	Total Centerline Miles	% Poor or Failed	% Excellent or Very Good	2018 Annual PCI Score				Change		3 YR Moving Average		
					Arterial	Collector	Residential	Network	2017 Network PCI	Change, 2017 to 2018	2016	2017	2018
<b>Alameda</b>	<b>8,191</b>	<b>3,645</b>	<b>23%</b>	<b>39%</b>	<b>75</b>	<b>67</b>	<b>64</b>	<b>68</b>	<b>67</b>	<b>1</b>	<b>68</b>	<b>68</b>	<b>68</b>
Alameda	276.5	124.9	19%	42%	73	73	68	70	71	-1	71	72	71
Alameda County	991.2	473.0	11%	28%	73	73	66	70	71	-1	71	71	71
Albany	58.4	29.5	43%	23%	53	58	56	54	57	-3	59	59	57
Berkeley	451.0	215.3	42%	30%	67	64	56	59	55	4	58	57	57
Dublin	326.5	149.2	2%	75%	83	81	87	85	85	0	85	85	86
Emeryville	46.2	19.7	5%	16%	73	70	69	71	73	-2	79	77	74
Fremont	1,080.8	502.0	11%	40%	79	74	68	73	73	0	71	72	73
Hayward	655.1	282.1	23%	58%	75	69	69	71	71	0	68	70	71
Livermore	711.2	340.6	4%	61%	81	78	80	79	80	-1	76	78	78
Newark	255.5	106.0	8%	52%	78	73	76	76	76	0	76	76	76
Oakland	2,022.5	830.9	47%	22%	73	51	45	55	52	3	56	54	54
Piedmont	77.8	38.7	32%	25%	79	69	53	61	63	-2	62	61	61
Pleasanton	515.8	213.6	4%	58%	75	77	85	79	80	-1	78	79	79
San Leandro	393.8	181.7	43%	23%	71	64	47	56	59	-3	56	57	58
Union City	329.2	137.7	5%	51%	72	75	80	78	79	-1	82	81	80
<b>Bay Area</b>	<b>43,493</b>	<b>20,178</b>	<b>22%</b>	<b>37%</b>	<b>74</b>	<b>69</b>	<b>64</b>	<b>68</b>	<b>67</b>	<b>1</b>	<b>67</b>	<b>67</b>	<b>67</b>

# KPI IN STREETSAVER

## Key Performance Indicators

Refresh KPI Data

Show Executive Dashboard



- These KPIs are calculated based on a 10-year Needs analysis.
- Pavement preservation is defined by treatment applied in Condition Categories I and II.
- State of Good Repair (SGR) is defined as achieving the optimal PCI where there is no deferred maintenance.

# Your Tax Dollars At Work

## Performance

- Promote sound pavement preservation
- Outcome driven – “worst first” to preventive maintenance

## Accountability

- Taxpayers know where the money is spent
- Establish “maintenance of effort” for local agencies

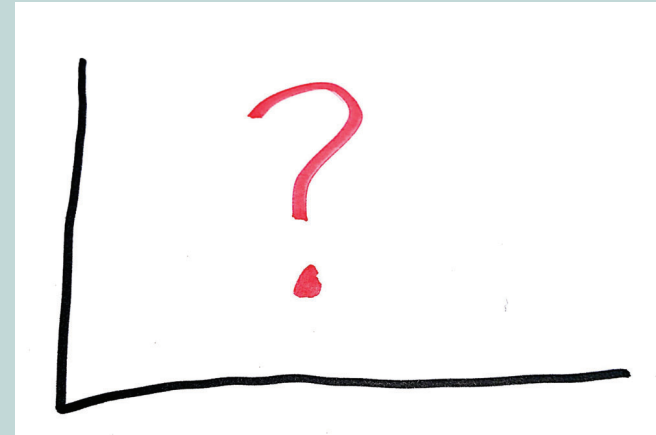
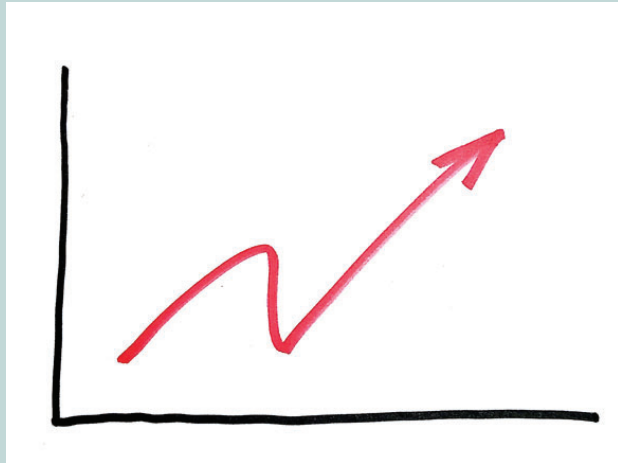
## Transparency

- Reports for internal & external customers





Look  
Beyond PCI  
and IRI...



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