

ROADWAY PAVEMENT MANAGEMENT PROGRAM & FUNDING

December 19th, 2017



Background

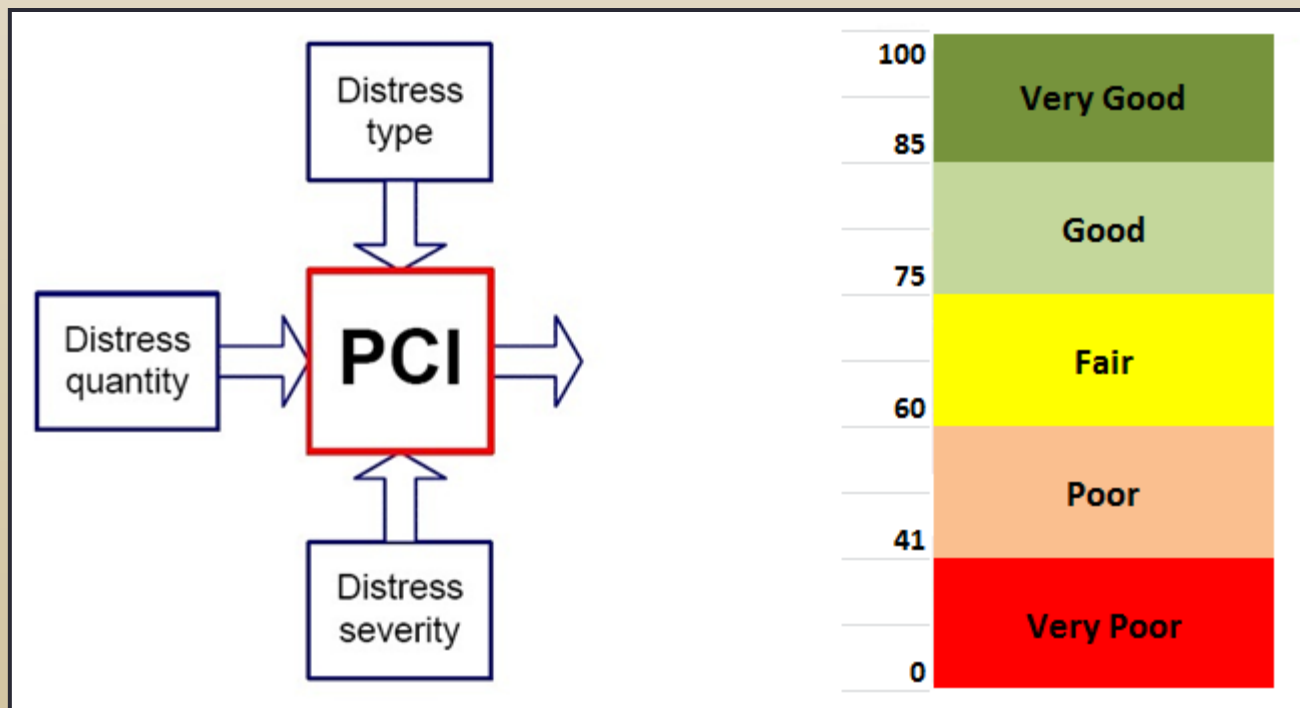
- City maintains approximately 67 miles of arterial roads and 228 miles of local roads (residential/industrial roads)
- Typical design 'life' of a roadway surface is 20 years.
 - Regular maintenance (e.g. slurry seal & overlay) can continuously extend the pavement 'life', thereby reducing the need for significant rehabilitation.
- Public Works prepares and updates a Pavement Management Program (PMP) every two years.

Pavement Management Program

- The PMP objective is to:
 - Determine existing pavement conditions
 - Develop pavement rehabilitation strategies
 - Determine schedule for maintenance or rehabilitation
 - Forecast future pavement rehabilitation projects
 - Type of repair, locations and scope
 - Forecast budget needs
- PMP includes inspections of the arterial roads every two years and the local roads every six years.
- The program determines the existing roadway condition and assigns a Pavement Conditions Index (PCI) rating from 0-100 for each roadway segment.

Pavement Condition Index

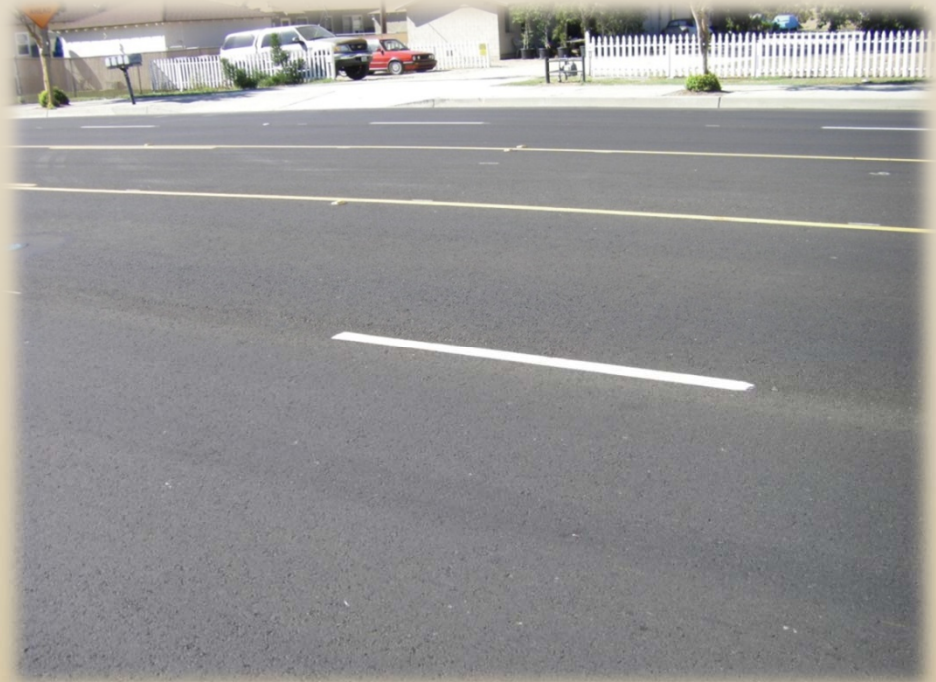
- The PCI is a function of overall condition of the pavement. Condition problems include potholes, cracking, failures, rutting, etc.
- Fewer problems = higher PCI rating



PCI Ratings

PCI 86-100 – Very Good

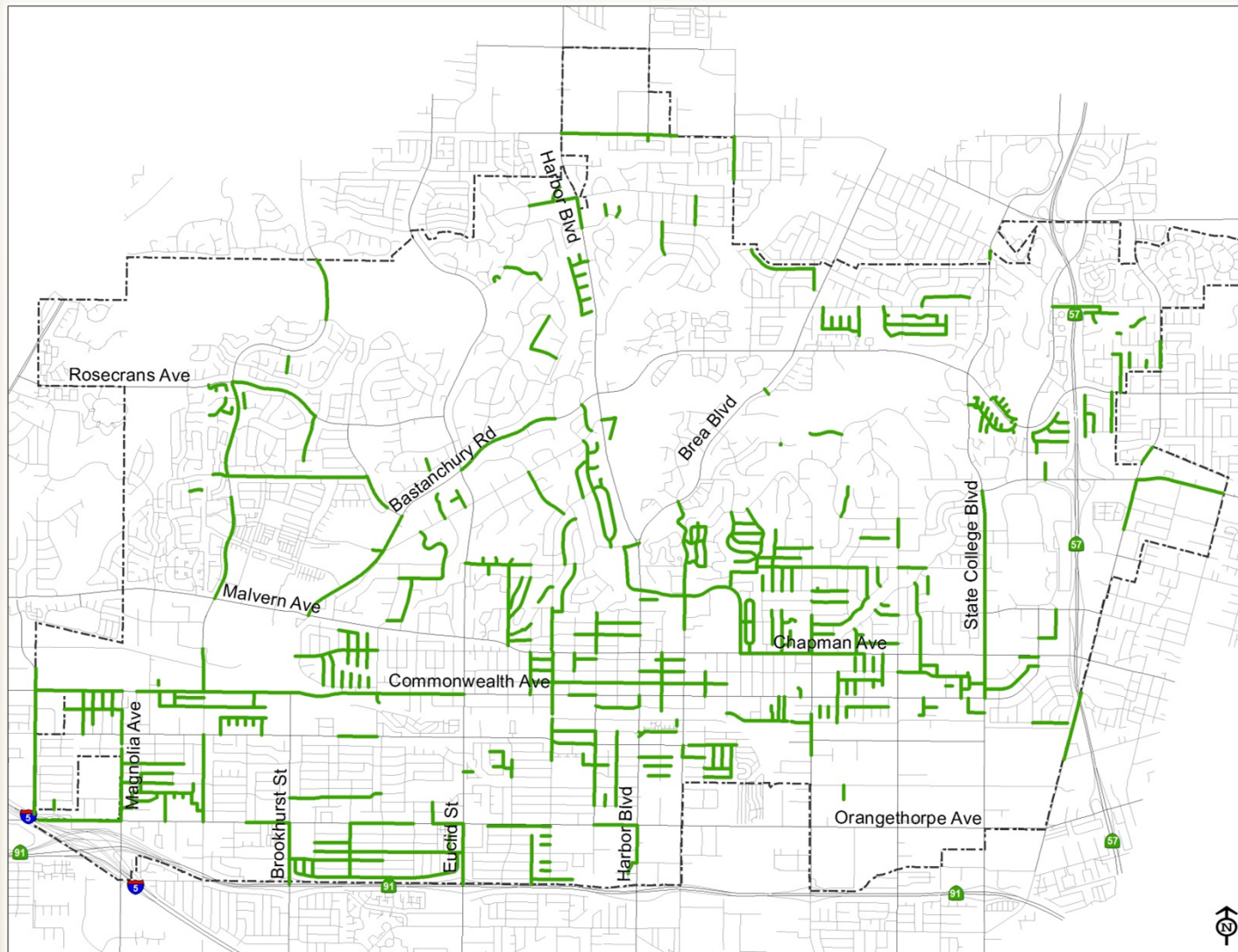
- Typical rehabilitation – Slurry Seal application after 10 years
- 27% of arterial roads (18 miles)
- 23% of local roads (52 miles)



*State College Boulevard
(north of Commonwealth Avenue)*

PCI = 100

Streets with PCI Rating 86-100 (V. Good)



PCI Ratings

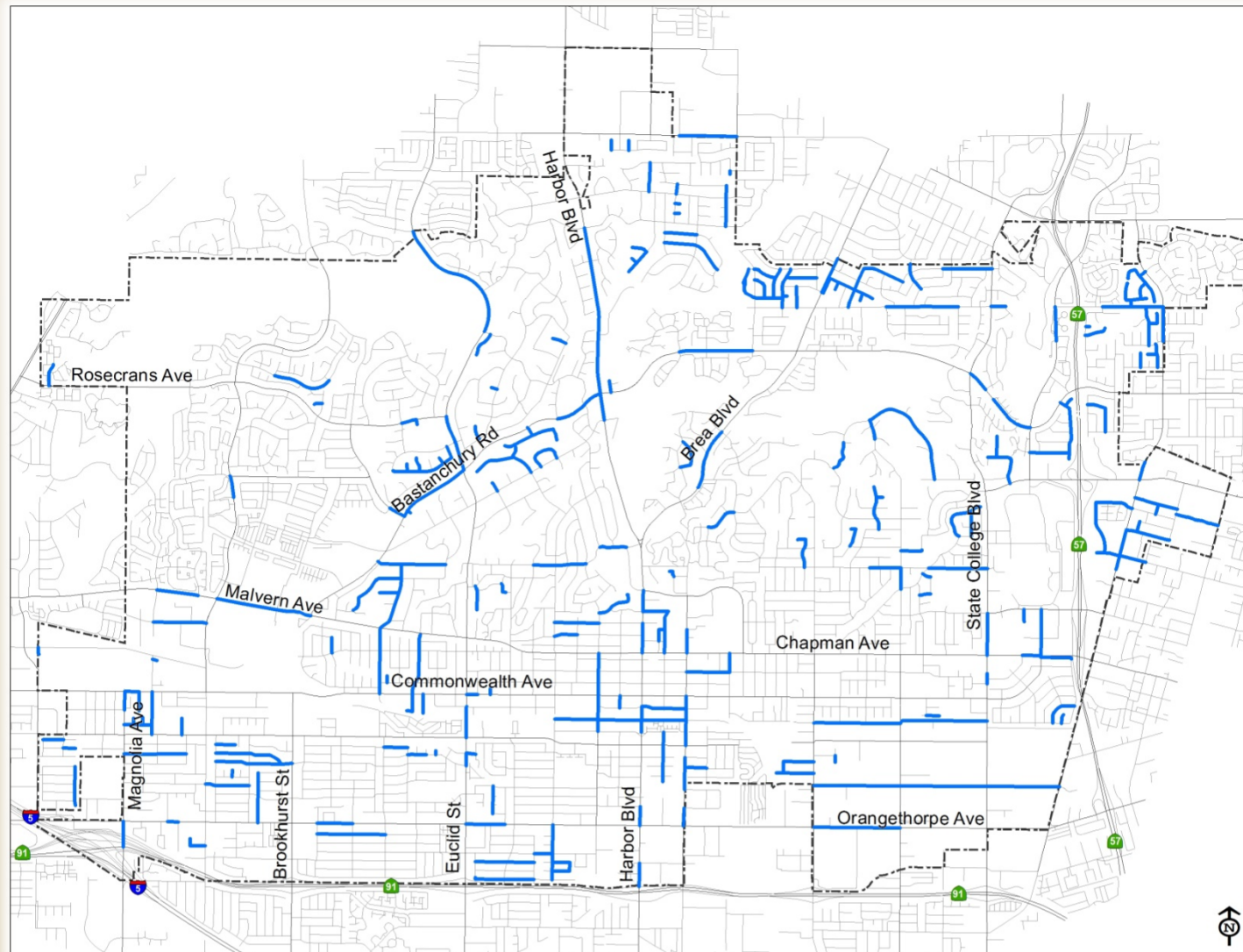
PCI 75-85 - Good

- Typical rehabilitation - Crack Seal and Slurry Seal
- 14% of arterial roads (9 miles)
- 13% of local roads (30 miles)



*Highland Avenue
(north of Commonwealth Avenue)
PCI = 80*

Streets with PCI Rating 75-85 (Good)



PCI Ratings

PCI 60-74 - Fair

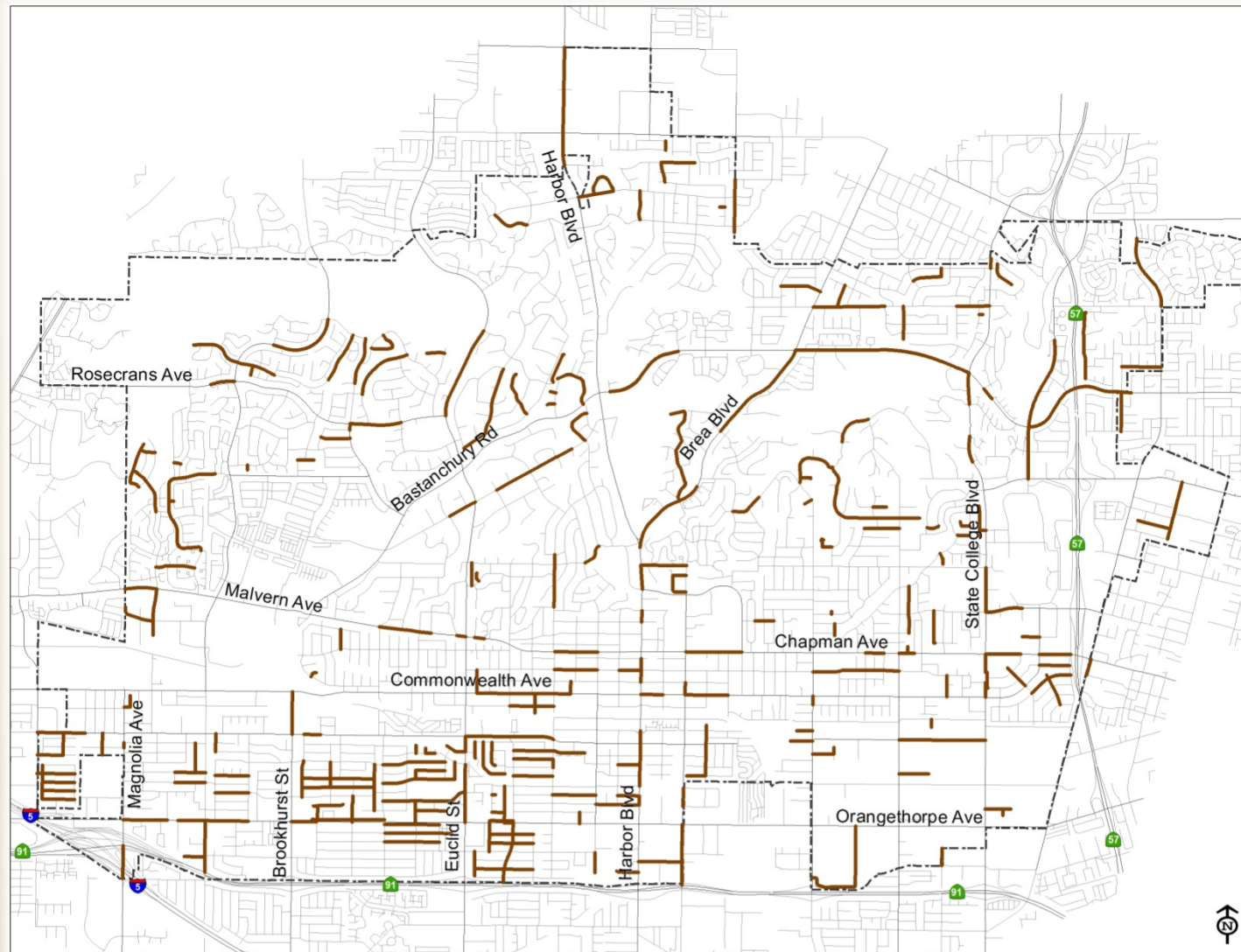
- Typical rehabilitation - Thin Overlay/Spot Repairs
- 22% of arterial roads (15 miles)
- 15% of local roads (34 miles)



*Chapman Avenue
(east of State College Boulevard)*

PCI = 70

Streets with PCI Rating 60-74 (Fair)



PCI Ratings

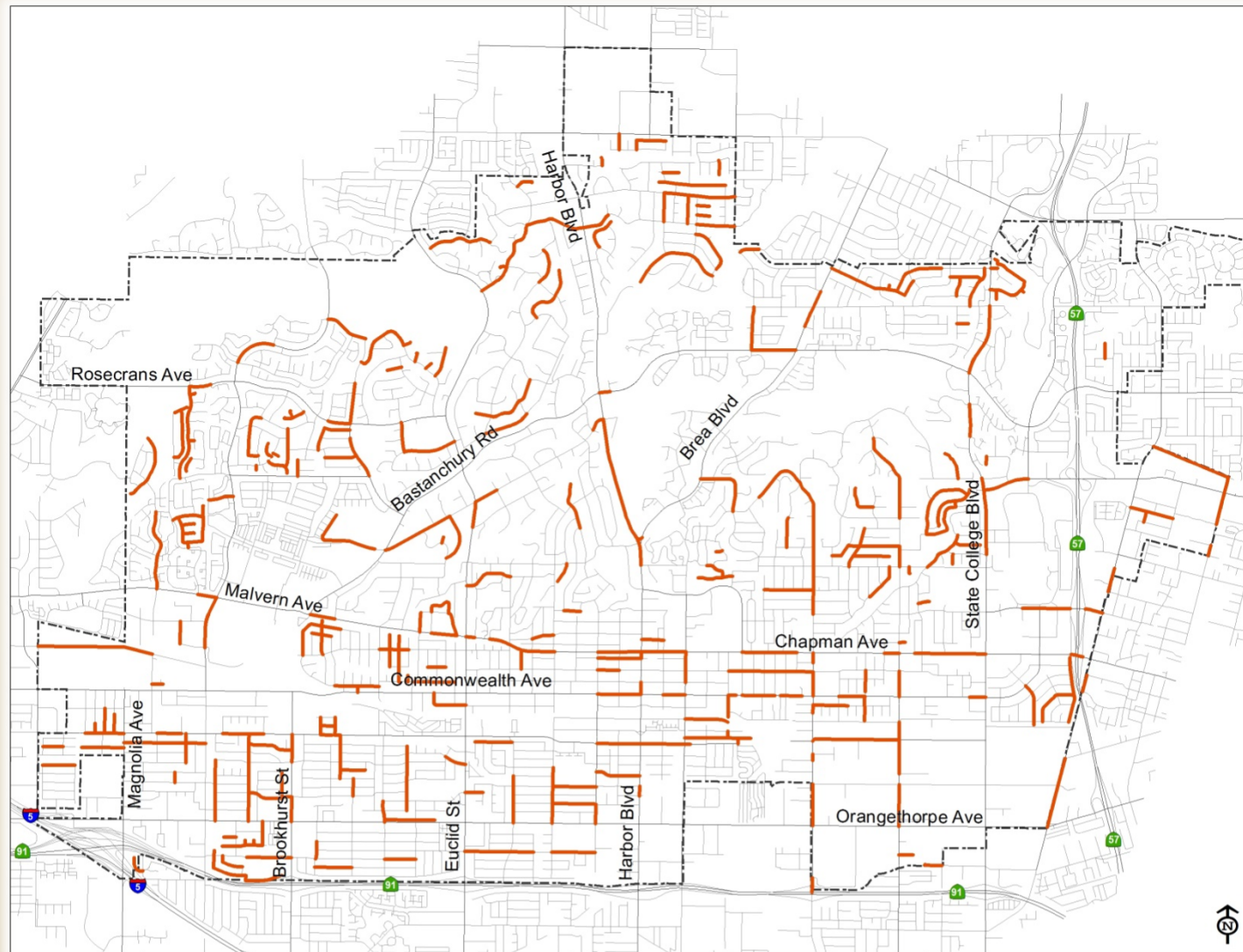
PCI 41-59 - Poor

- Typical rehabilitation = Thick Overlay
- 19% of arterial roads (13 miles)
- 16% of local roads (37 miles)



*Acacia Avenue
(north of Commonwealth Avenue)
PCI = 49*

Streets with PCI Rating 41-59 (Poor)



PCI Ratings

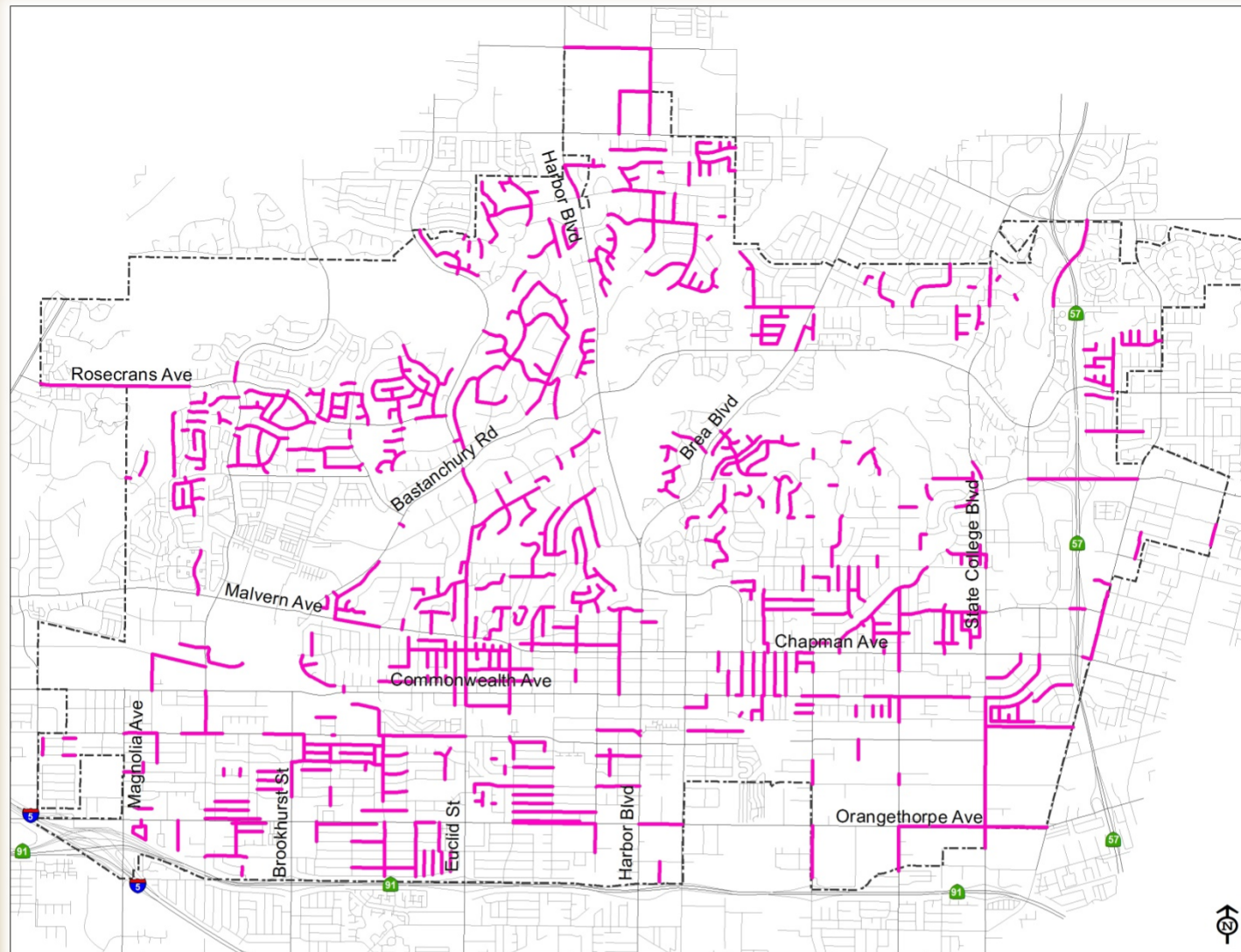
PCI 0-40 – Very Poor

- Typical rehabilitation = Full Reconstruction / Remove & Replace
- 18% of arterial roads (12 miles)
- 33% of local roads (75 miles)



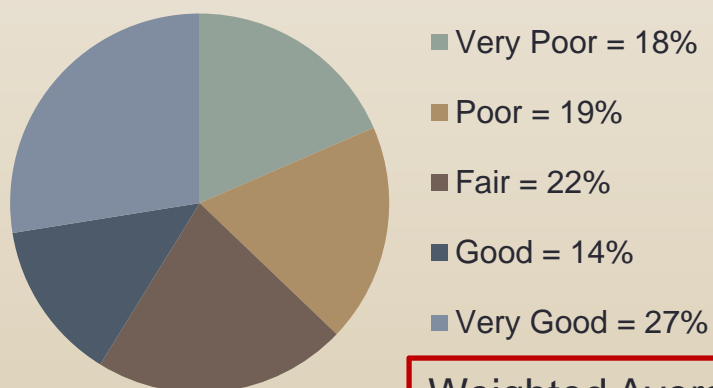
*Victoria Drive
(west of Dorothy Lane)
PCI = 13*

Streets with PCI Rating 0-40 (Very Poor)



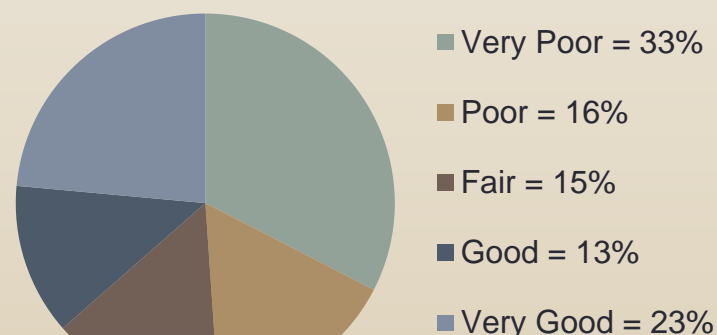
PCI Rating Summary*

PCI - Arterial Roads



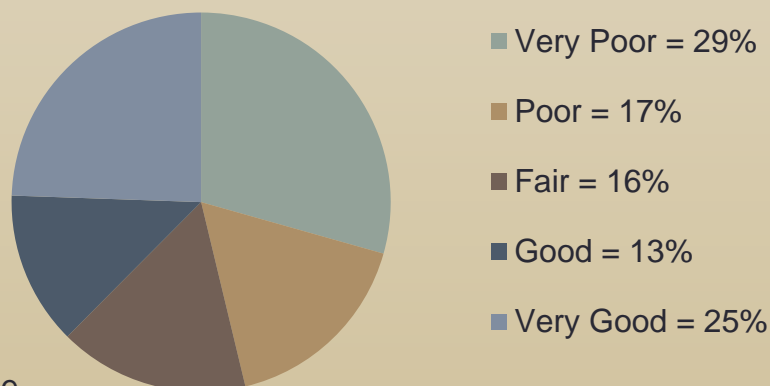
Weighted Average
PCI = 65.6 (Fair)

PCI - Local Roads



Weighted Average
PCI = 59.2 (Poor)

PCI - All Roads (Weighted)



Overall Weighted
City Average
PCI = 61.6 (Fair)

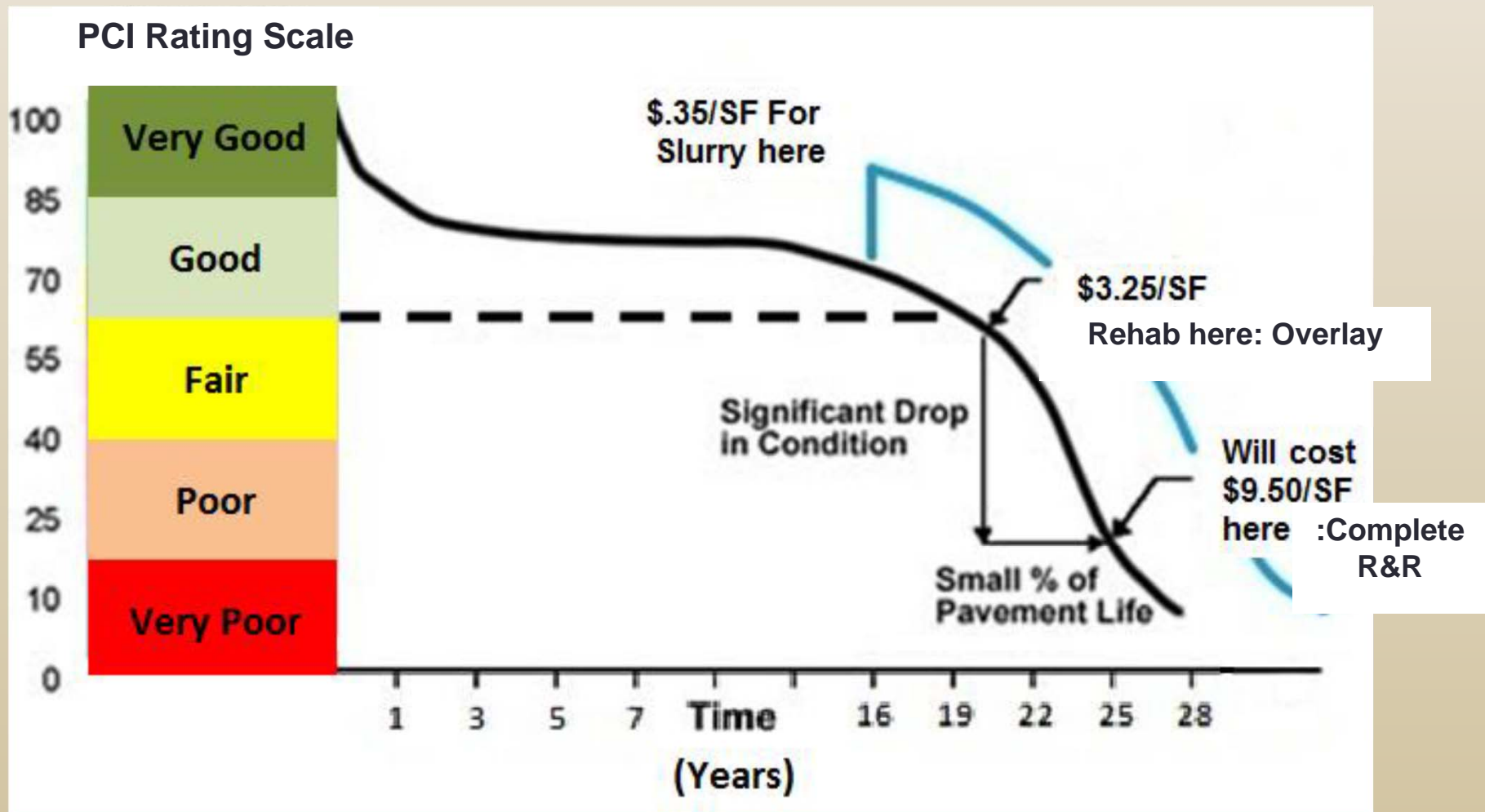
* All data based on 2016 PMP Update

Factors That Effect Pavement Life

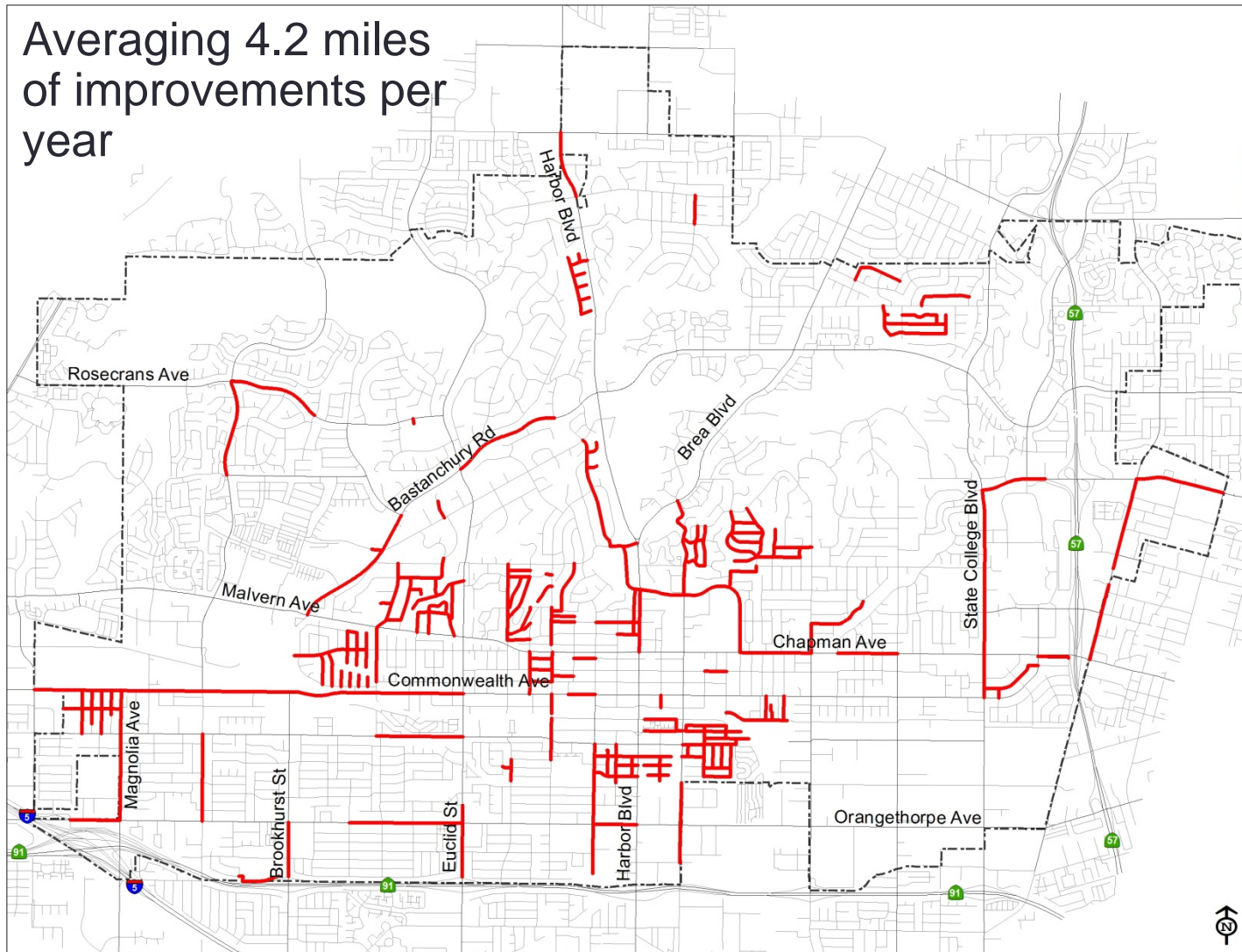
- *Delay of Preventive Maintenance*
- *Traffic Volume and Loading*
- *Age of Pavement*
- *Type of Pavement (PCC vs AC)*
- *Soil and Base Material Under Pavement*
- *Storm Water Infiltration into Subgrade*
- *Utility Trench Cuts*



Pavement Life Cycle Costs

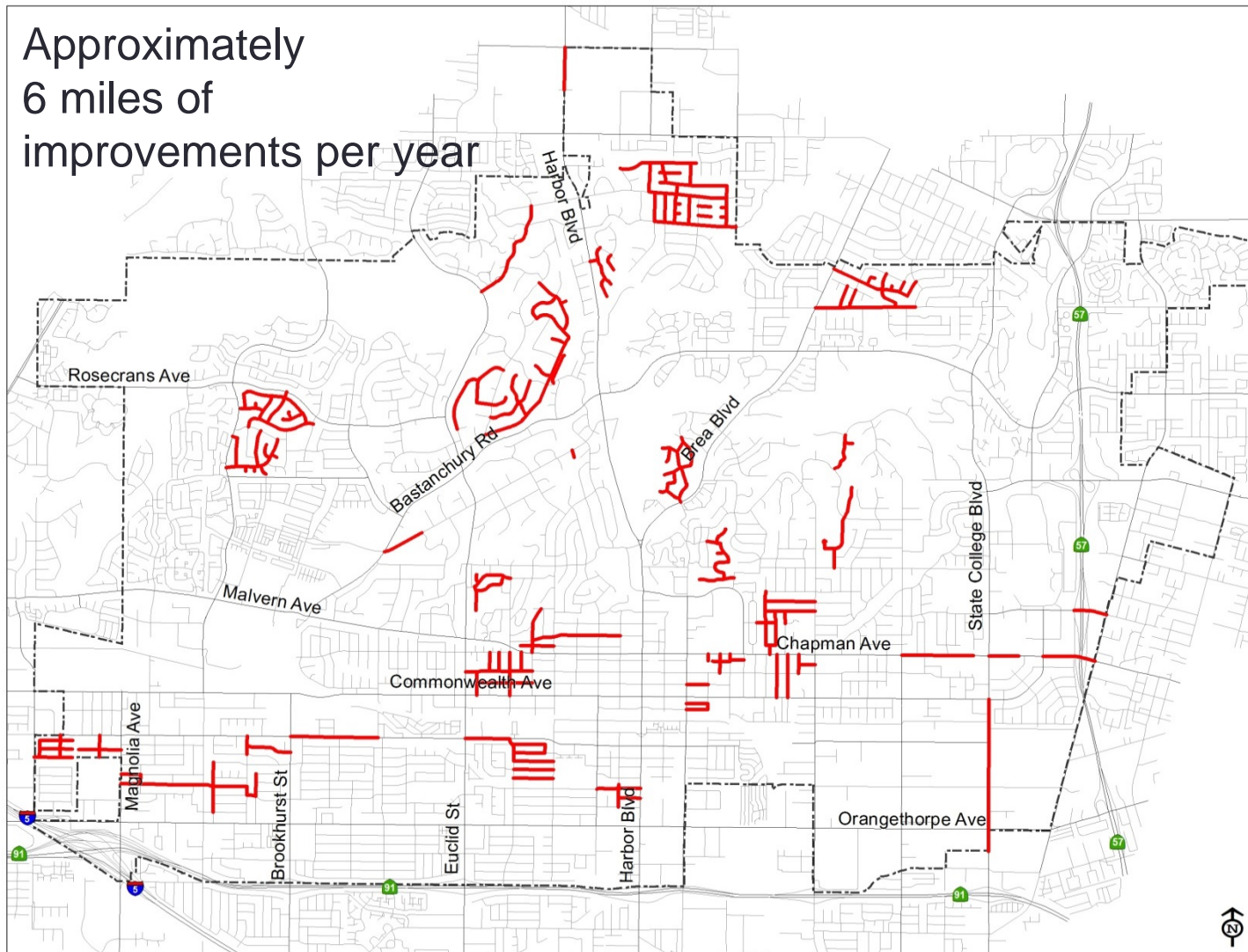


Street Improvements – Last 10 years



Proposed Street Improvements - Next 5 Years

(without SB1 Funding or Property Sale(s))



Current Funding

Fiscal Year	Residential Slurry Seal	Local Overlay/Recon	Arterial Overlay/Recon	Total
2016-17	0	\$2,100,000	\$561,000	\$2,661,000
2017-18	\$500,000	\$1,800,000	\$2,580,000*	\$4,880,000**
2018-19	\$500,000	\$1,900,000	0	\$2,400,000
2019-20	\$500,000	\$1,500,000	0	\$2,000,000
2020-21	\$500,000	\$1,700,000	\$1,400,000	\$3,600,000
2021-22	\$500,000	\$1,100,000	\$1,750,000	\$3,350,000
				\$18,891,000

Current funding levels will result in an overall City PCI rating of mid/high 50's (poor) by 2022.

Does not include potential SB1 funds

Does not provide funding for alley maintenance needs

* \$1,380,000 carry over from 16/17 for State College south of railroad

** Does not include additional \$2.6 million expected from property sale(s)

Funding to Maintain Existing PCI

Fiscal Year	Residential Slurry Seal	Local Overlay/Recon	Arterial Overlay/Recon	Total	PCI Rating	Total Available With SB1
2016-17	\$975,200	\$2,074,800	\$2,939,000	\$5,989,000	62.8	\$2,661,000*
2017-18	\$985,300	\$2,096,200	\$2,932,100	\$6,013,600	61.9	\$5,684,895
2018-19	\$969,400	\$2,038,600	\$2,921,600	\$5,929,600	62.2	\$4,800,000
2019-20	\$972,400	\$2,026,900	\$2,921,400	\$5,920,700	62.4	\$4,400,000
2020-21	\$979,800	\$2,091,200	\$2,941,000	\$6,012,000	62.6	\$6,000,000
2021-22	\$978,700	\$2,025,900	\$2,936,700	\$5,941,300	61.7	\$5,750,000
2022-23	\$980,100	\$2,022,100	\$2,939,500	\$5,941,700	61.8	\$5,750,000
				\$41,747,900		\$35,045,895

Funding levels will maintain the existing Overall City PCI rating at 61.8 (low fair).

Source: 2016 Citywide PMP Report, May 25, 2016

* No SB1 funding during FY 16-17

Funding to Increase PCI

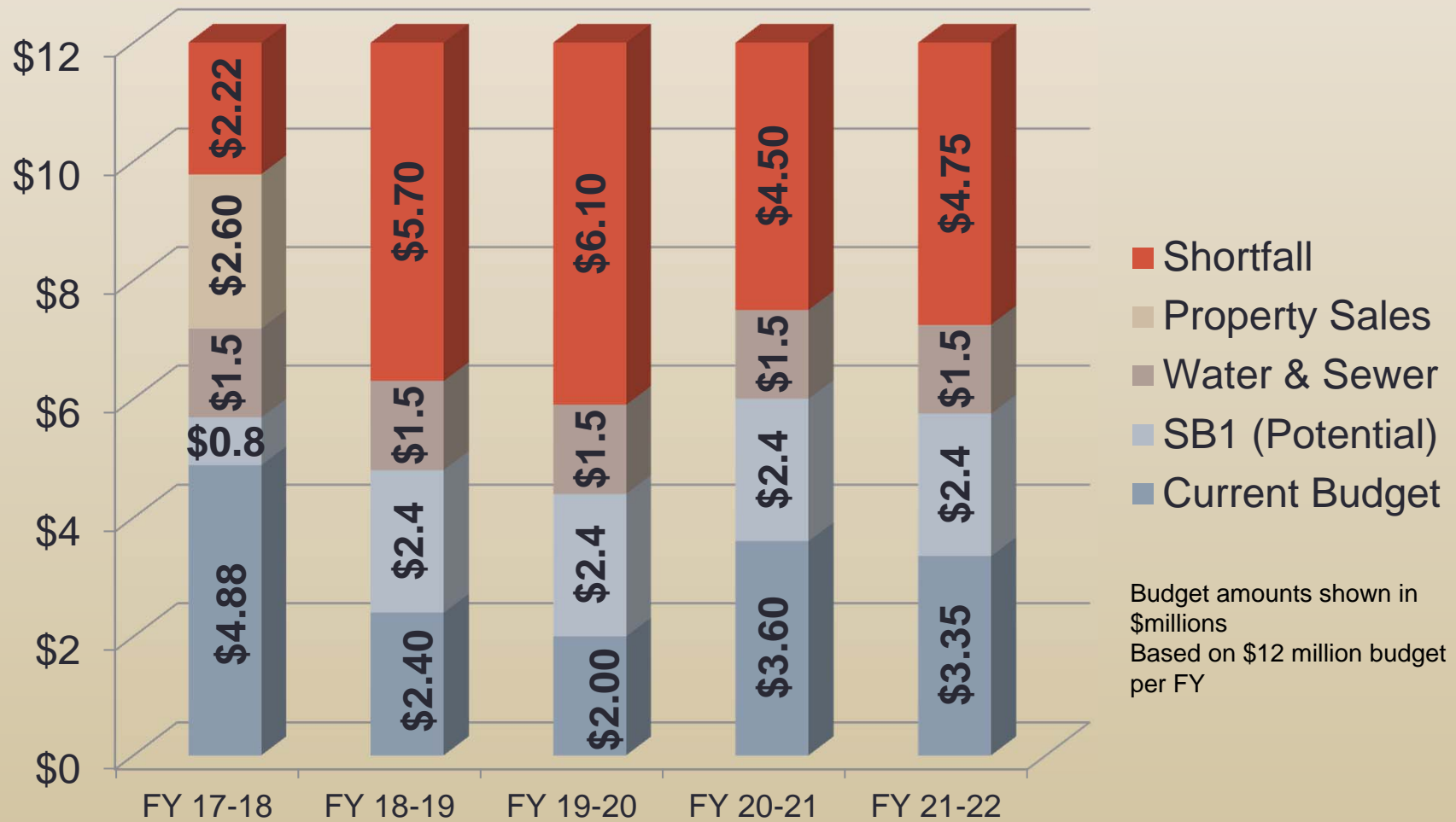
Fiscal Year	Residential Slurry Seal	Local Overlay/Recon	Arterial Overlay/Recon	Total	PCI Rating	Shortfall (with SB1 Funding)
2016-17	\$975,200	\$4,906,600	\$4,597,700	\$10,479,500	64.0	\$7,818,500
2017-18	\$985,300	\$5,015,400	\$4,589,100	\$10,589,800	65.8	\$4,904,905
2018-19	\$969,400	\$4,975,100	\$4,581,700	\$10,526,200	68.3	\$5,726,200
2019-20	\$972,400	\$4,988,600	\$4,591,600	\$10,552,600	68.5	\$6,152,600
2020-21	\$979,800	\$4,991,900	\$4,592,300	\$10,564,000	70.2	\$4,564,000
2021-22	\$978,700	\$4,725,400	\$4,874,000	\$10,578,100	70.5	\$4,828,100
2022-23	\$980,100	\$4,615,800	\$4,861,500	\$10,457,400	72.4	\$4,707,400
				\$73,474,600		\$38,701,705

Additional \$1.5 million needed to keep up with water and sewer projects.

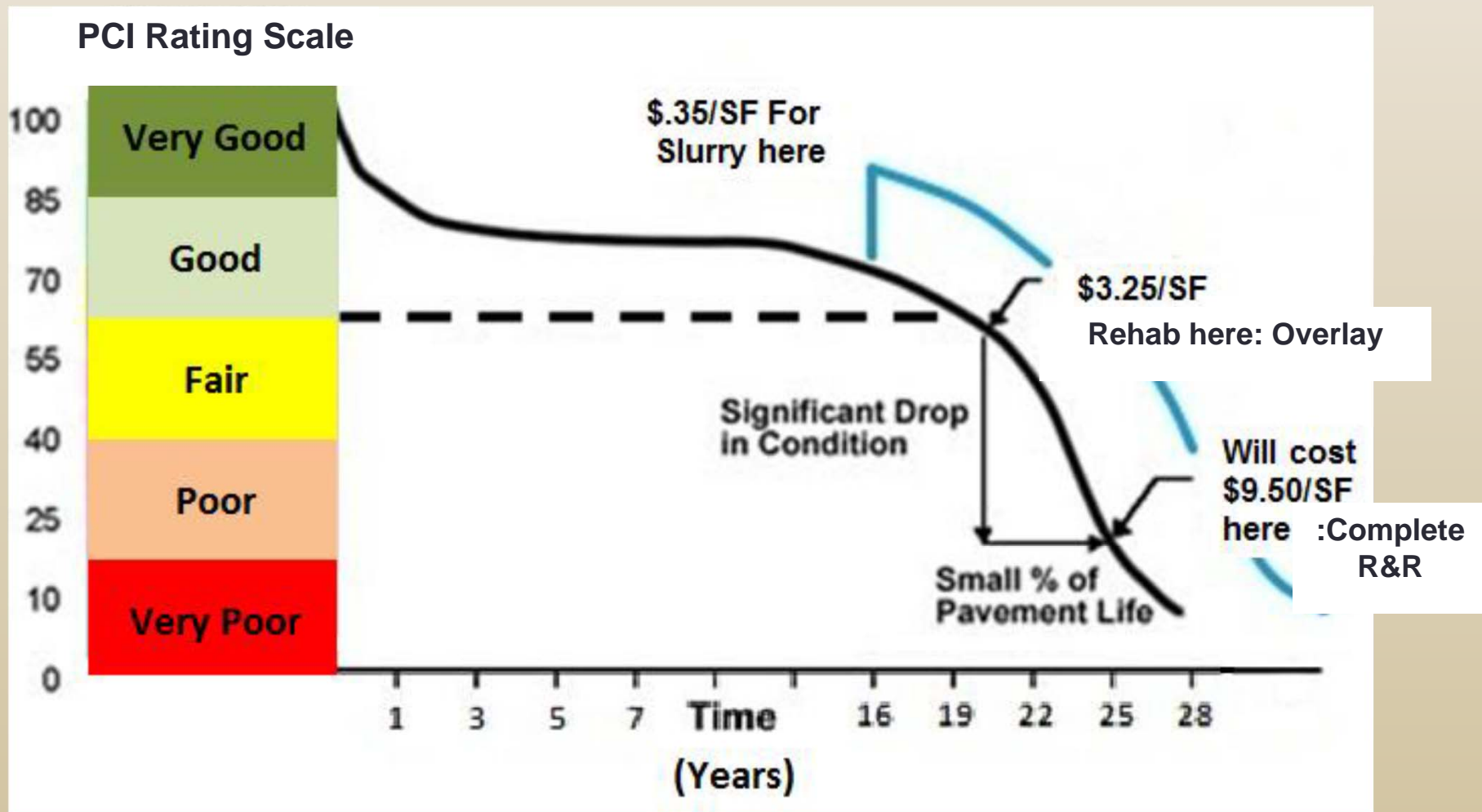
Funding levels will increase the existing Overall City PCI rating to 72.4 (high fair).

Source: 2016 Citywide PMP Report, May 25, 2016

Funding Breakdown



Pavement Life Cycle Costs



Pavement Life Cycle Costs (50-Year Comparison)

Total Remove & Replace (R&R)	Preservation/Rehab - Slurry Seal & Overlay
<ul style="list-style-type: none"> • 0 - 25 Yrs = \$9.50/sf • 0 - 50 Yrs = \$19/sf $(\\$9.50_{1st\ Yr} + \\$9.50_{25th\ Yr})$ • At 50 Yrs = <u>\$3.2M/mile</u> (32' wide local road) 	<ul style="list-style-type: none"> • 0 - 10 Yrs = \$9.50/sf • 0 - 50 Yrs = \$16.70/sf $(\\$9.50_{1st\ Yr} + \\$0.35_{10th\ Yr} + \\$3.25_{20th\ Yr} + \\$0.35_{30th\ Yr} + \\$3.25_{40th\ Yr})$ • At 50 Yrs = <u>\$2.8M/mile</u> (32' wide local road)
Preservation/Rehab less by \$400K/mile vs. R&R	

- City maintains 228 miles of local roads:
 - \$91M saving in 50 years (Preservation/Rehab vs R&R)
- Benefit per cost is much greater when invested in Rehab (PCIs 70-40) and/or Preservation (PCI 85-70) vs R&R Reconstruction (PCIs 40-0)

Questions?