City of Davis
Pavement Management Update

City Council Meeting

January 14, 2020

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What is a Pavement Management Program?

- City's overall program that plans maintenance and repair of pavement surfaces of streets and pathways

- Answers 4 main questions
  1. What streets and paths does the City own/maintain?
  2. What condition are they in?
  3. What repairs are needed & when?
  4. How much funding we have and how much is needed to maintain or improve the street network?

Pavement Management Program Components

- Street and Pathway Survey
  - Arterials and collectors: Every 3 years
  - Local streets and bike paths: Every 6 years
- Software (StreetSaver)- A cost-effective decision-making tool
  - Input streets and bike paths segments
  - Input pavement condition from survey
  - Input pavement treatments
  - Input financial assumptions (funding available, treatment costs, inflation)
  - Run scenarios based on financial goals and pavement condition goals
  - Output potential projects and draft scope

- Staff criteria –engineering judgement, coordination, other data
- Design and construction of pavement projects

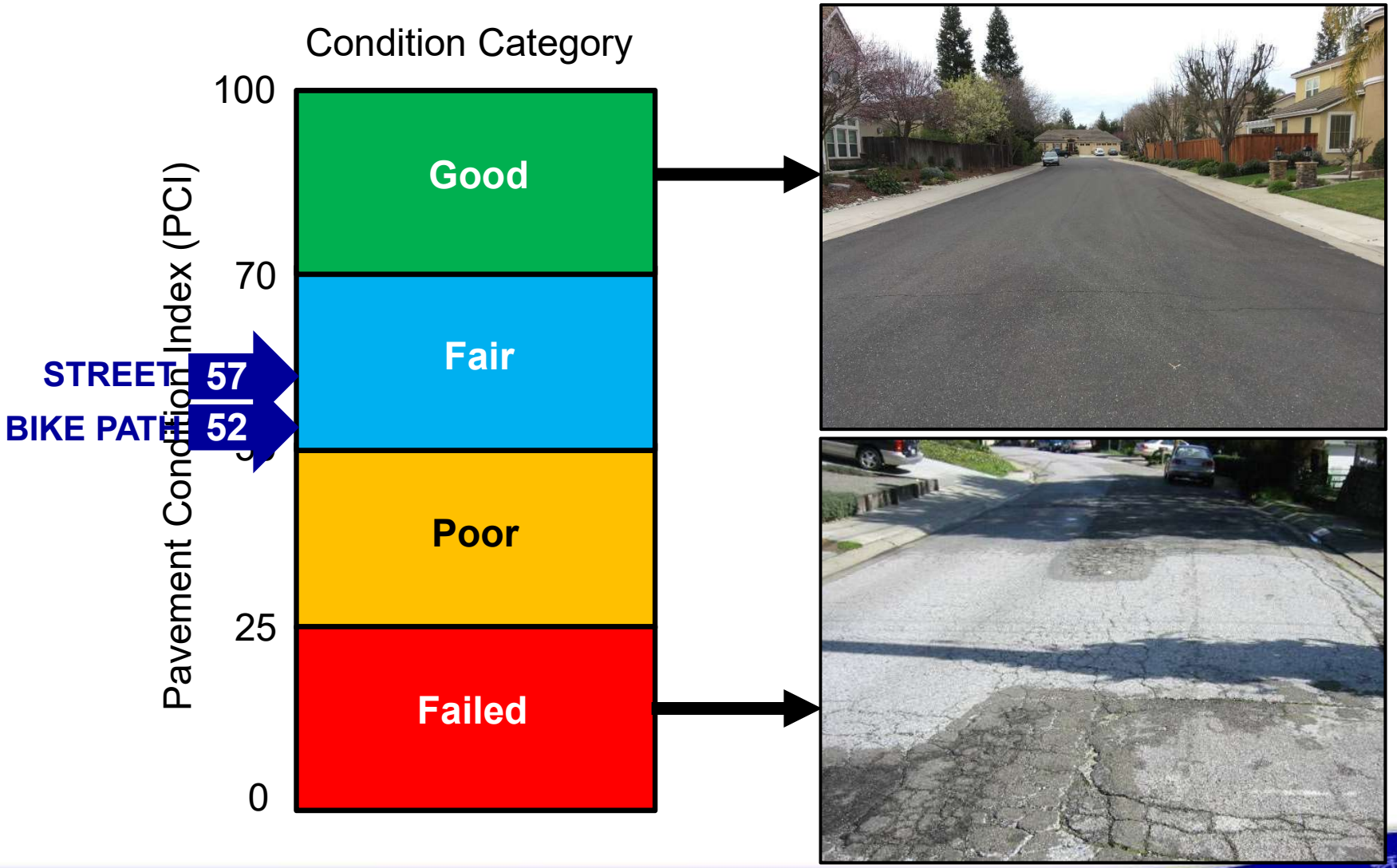
Streets & Bike Paths Maintained

Functional Class	No. Of Sections	Centerline Miles	Lane Miles	% of the Entire Network (by Pavement Area)
Arterials	147	33.1	81.8	25.2%
Collectors	152	34.3	73.1	23.6%
Residentials	757	97.3	195.0	50.9%
Others - Alleys	14	1.1	1.6	0.3%
Total	**1070**	**165.8**	**351.5**	**100%**
Gravel	7	0.6	0.7	-

Bike Path	No. Of Sections	Centerline Miles	% of the Bike Path Network (by Pavement
Total	289	51.7	100.0%

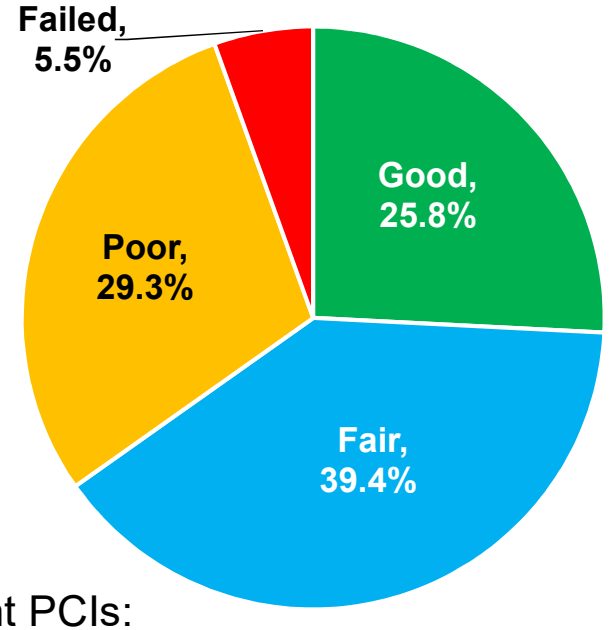
Asset value = $375 million

How is Pavement Condition Measured?

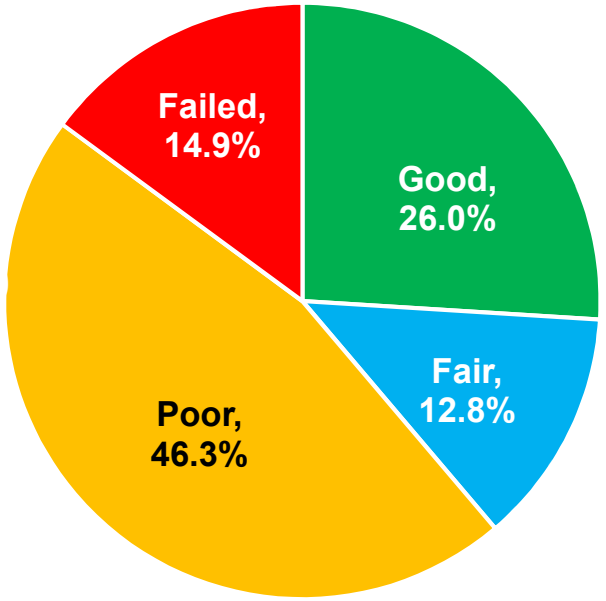


Current Pavement Conditions

Streets PCI = 57



Bike Paths PCI = 52



Current PCIs:

Arterials PCI = 64

Collectors PCI = 55

Residentials PCI = 55

Bike Paths PCI = 52

Target PCIs:

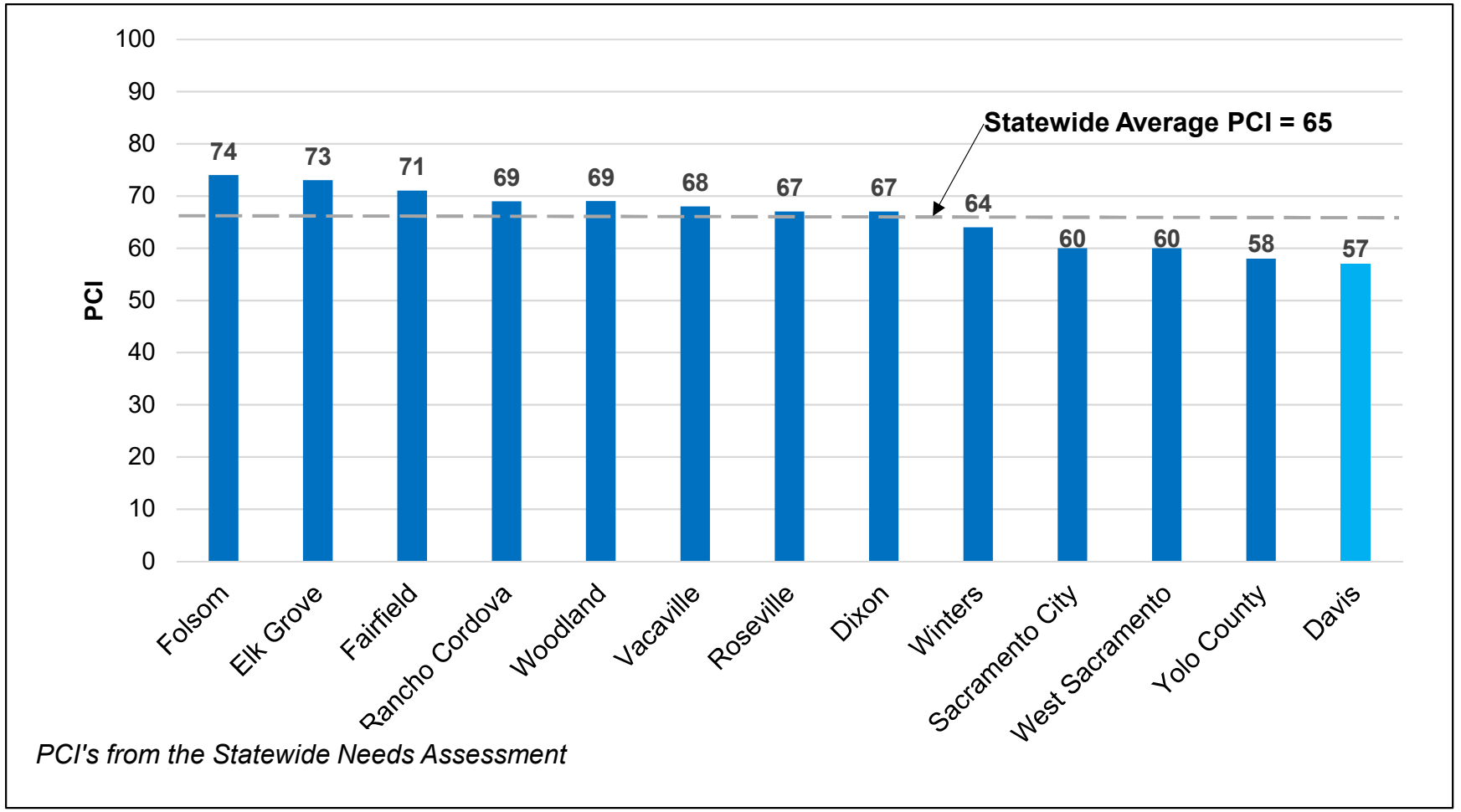
Arterials – 68

Collectors – 65

Residentials – 60

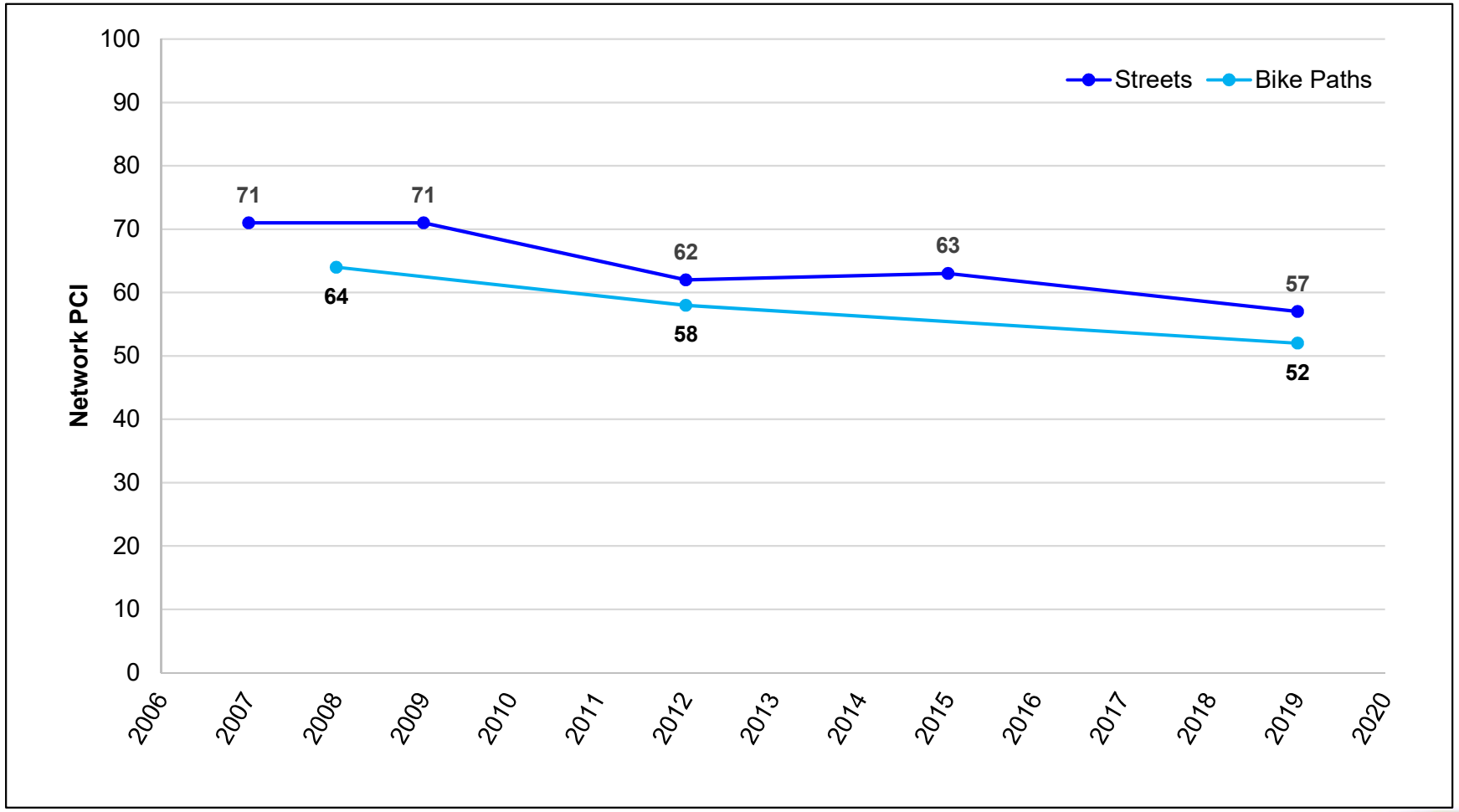
Bike Paths - 68

Comparing Davis With Neighbors

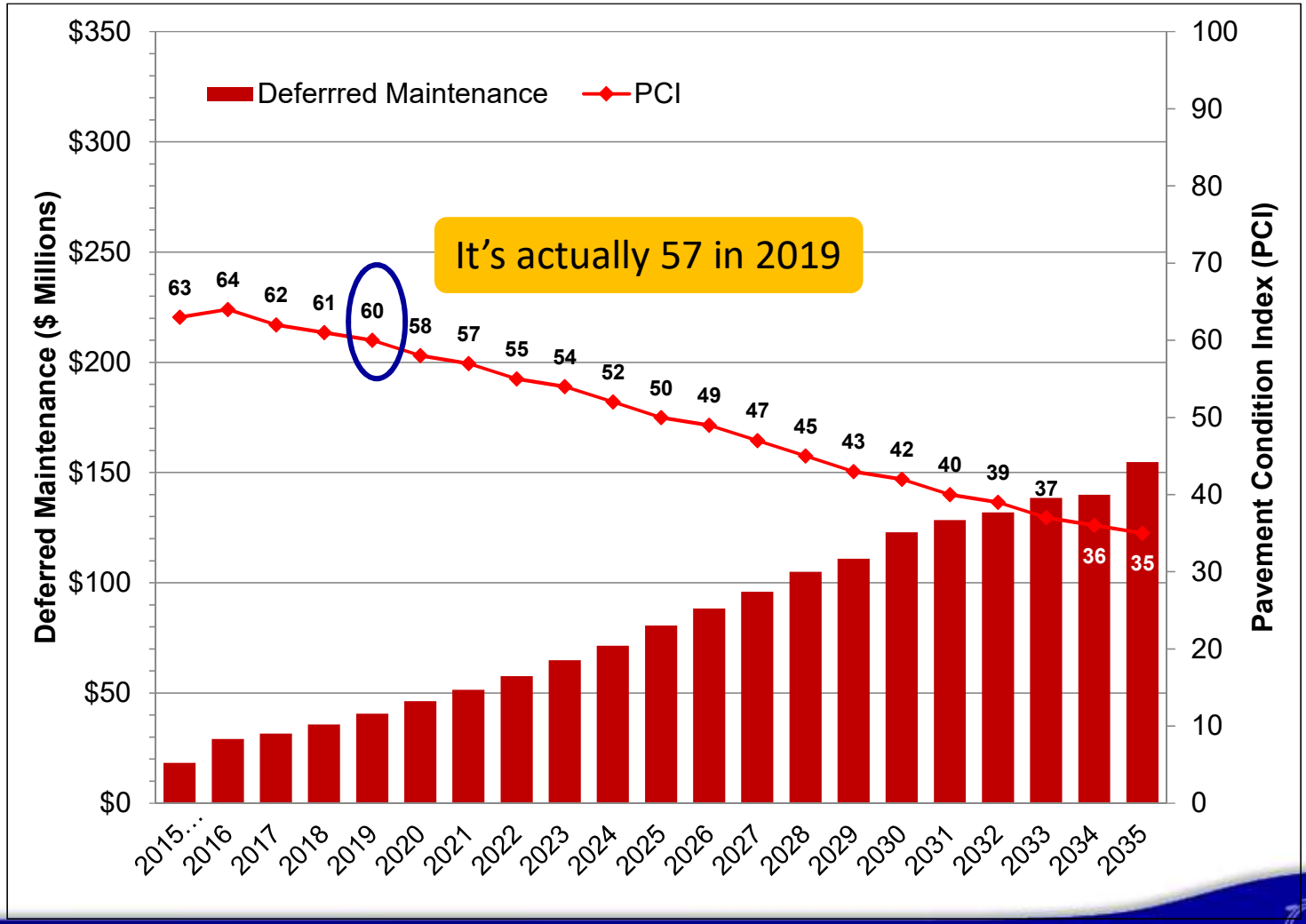


PCI's from the Statewide Needs Assessment

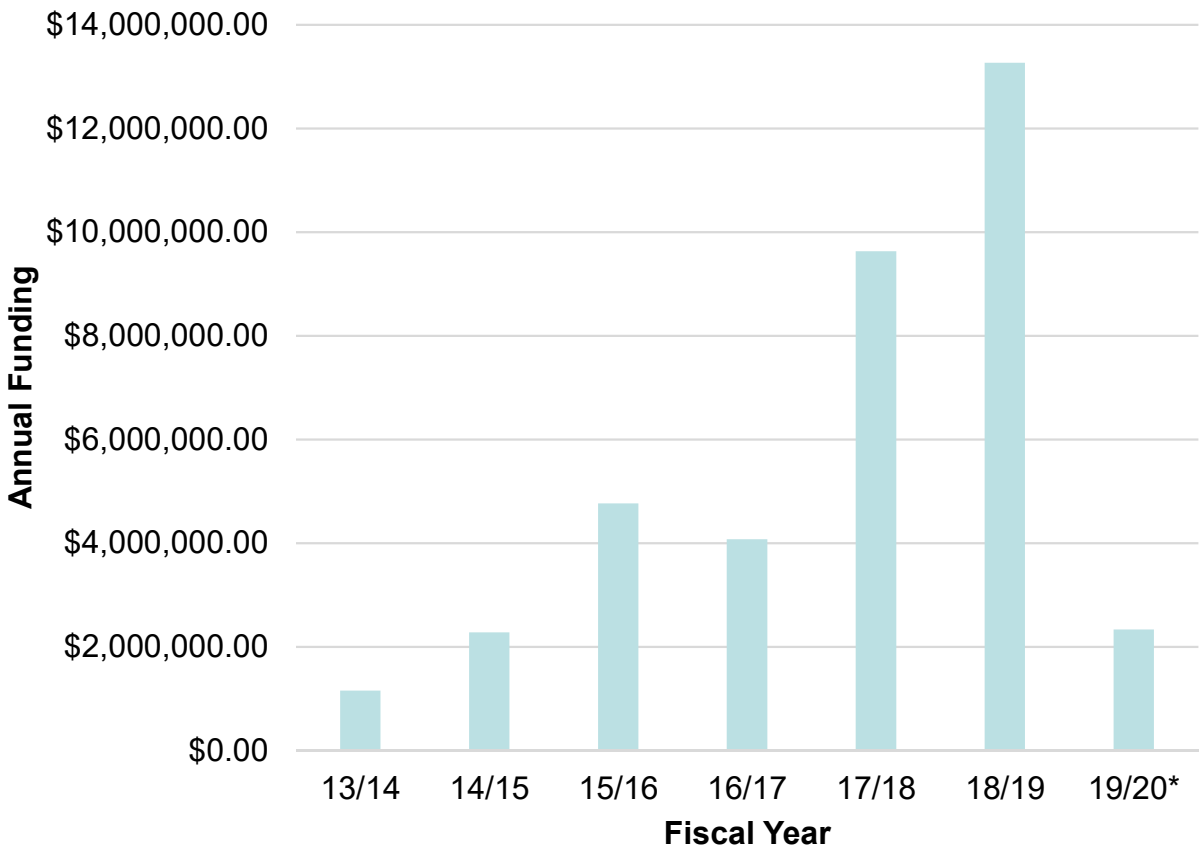
Historical Performance



2015 Report - Projected PCI

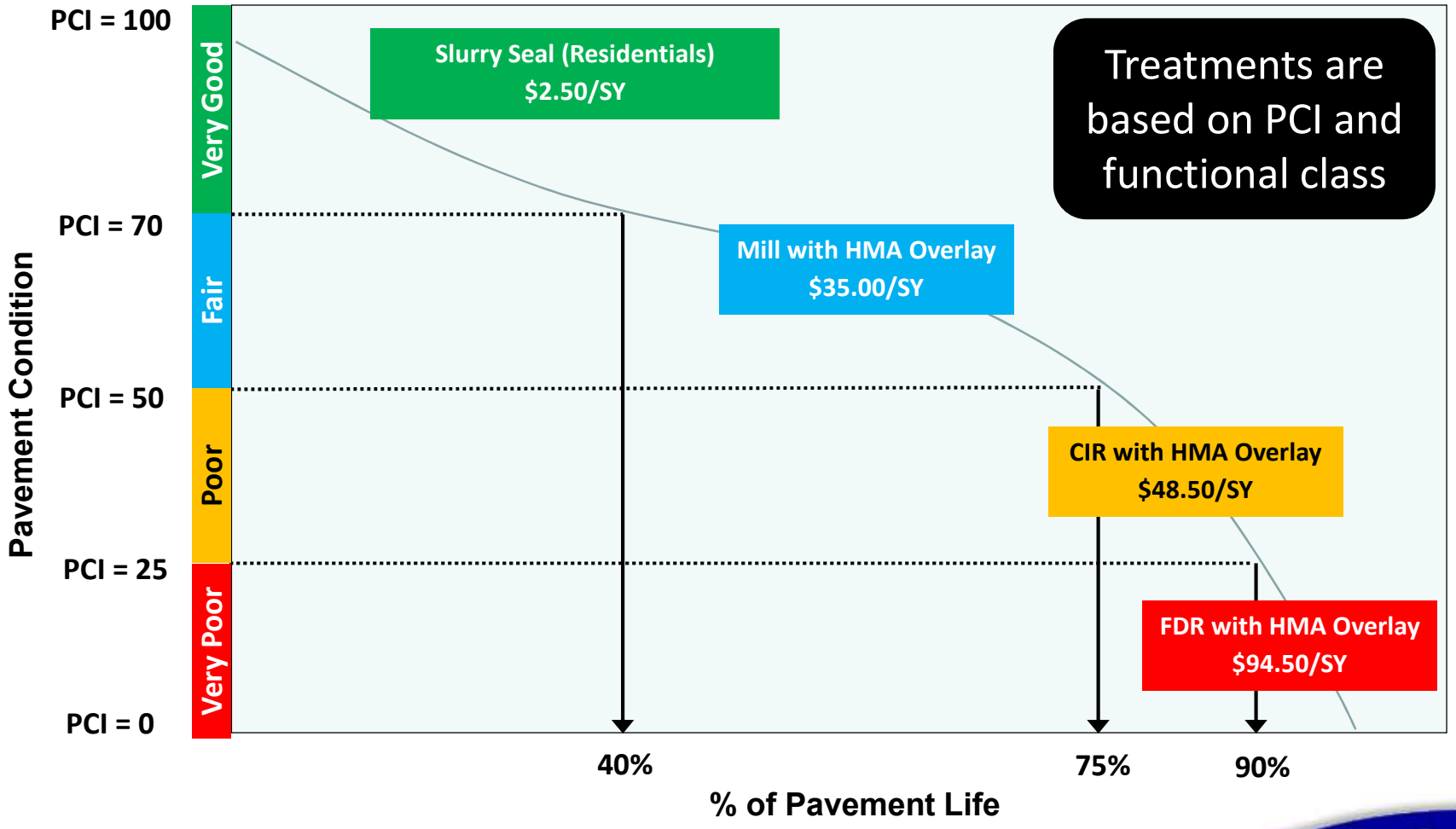


Total Local Funds Spent on Pavement Projects
FY 2013/14 - 2019/20

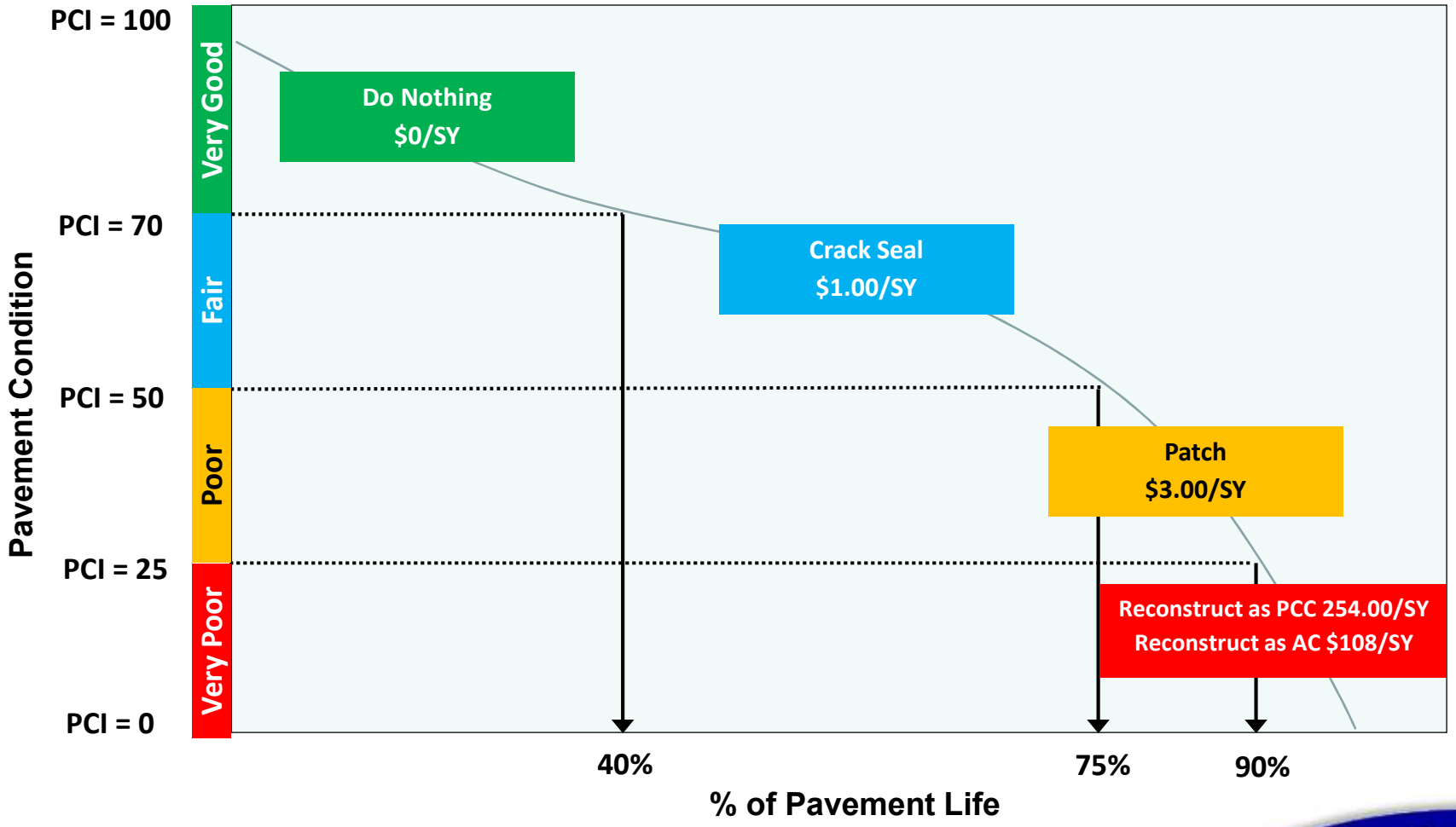


*** Funds spent to date in FY 2019/20**

Typical Decision Tree – Identifies Repairs Needed



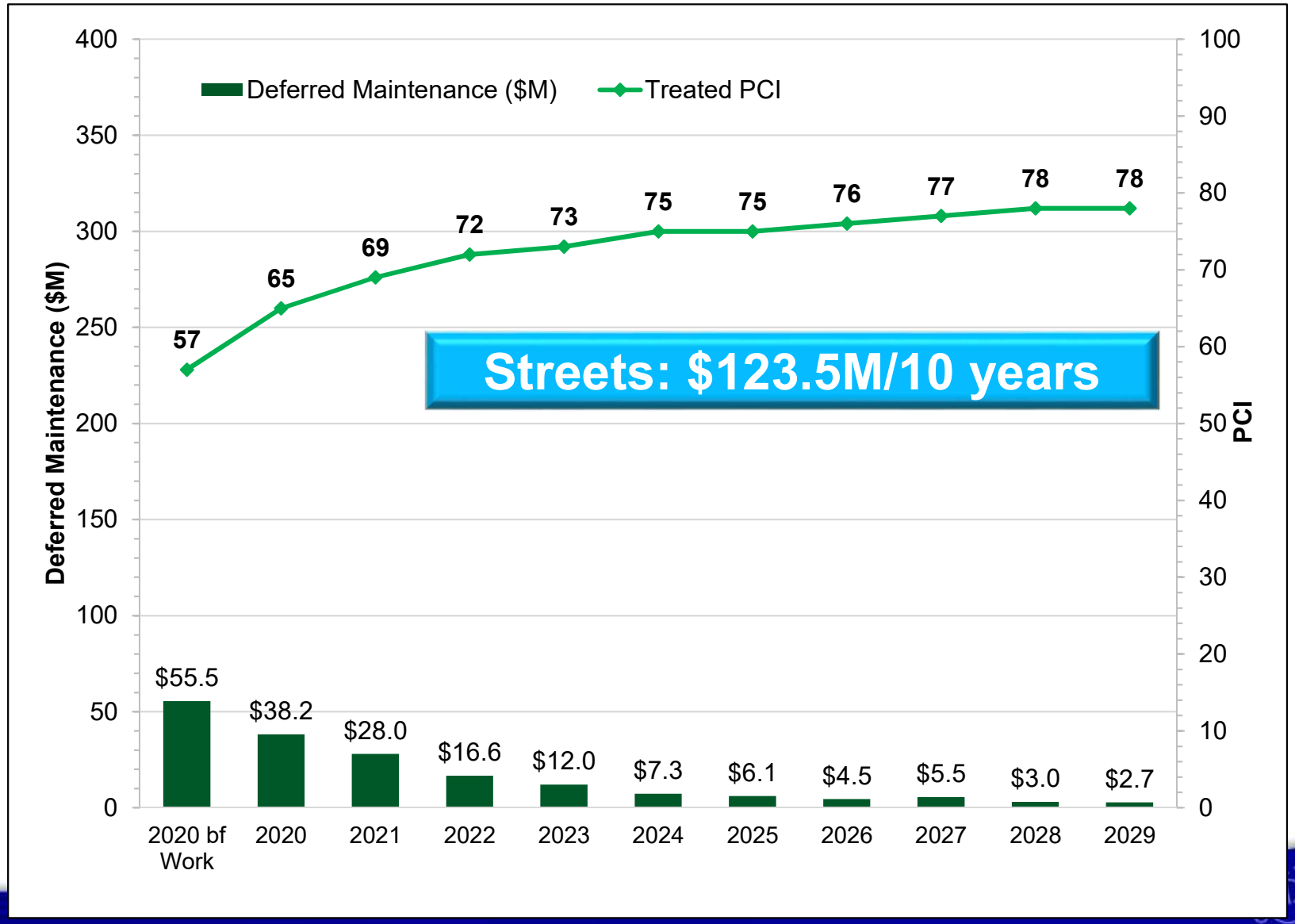
Decision Tree for Bike Paths



Funding Scenarios

1. Fix Everything (Unconstrained Budget)
2. Existing Funding ($5.1M)
3. Maintain Current PCI
4. Improve to Target PCIs
   - Arterials – 68
   - Collectors – 65
   - Residentials – 60
   - Bike Paths - 68

Scenario 1: Fix Everything



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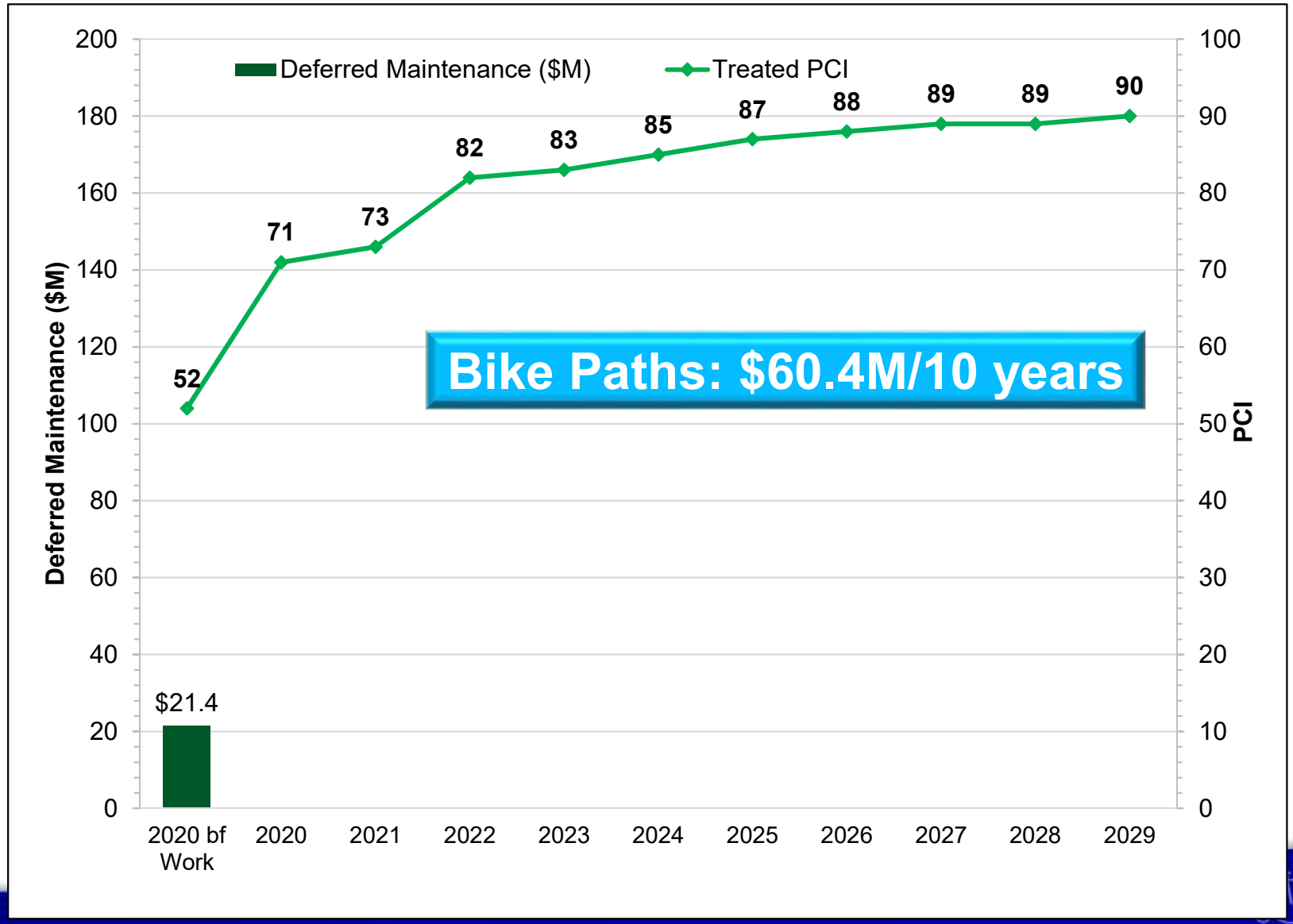


Scenario 2: Existing Budget for PMP Program

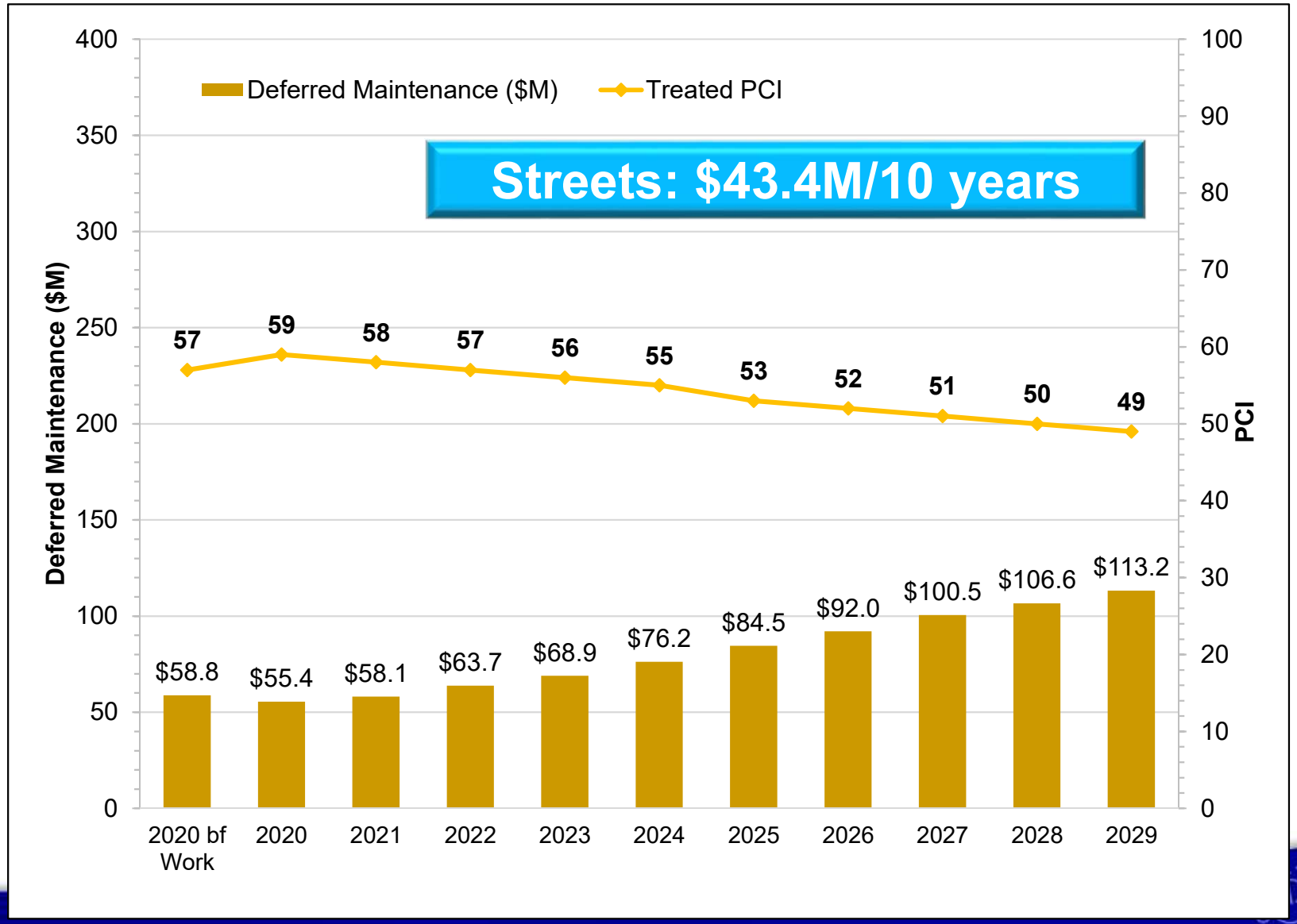
Local Funding = $3.9 Million/Year

+ SB 1 Funding = $1.2 Million/Year

Total = $5.1 Million/Year

85% for Streets = $4.335 Million/Year	15% for Bike Paths = $765,000/Year

Scenario 2: Existing Budget



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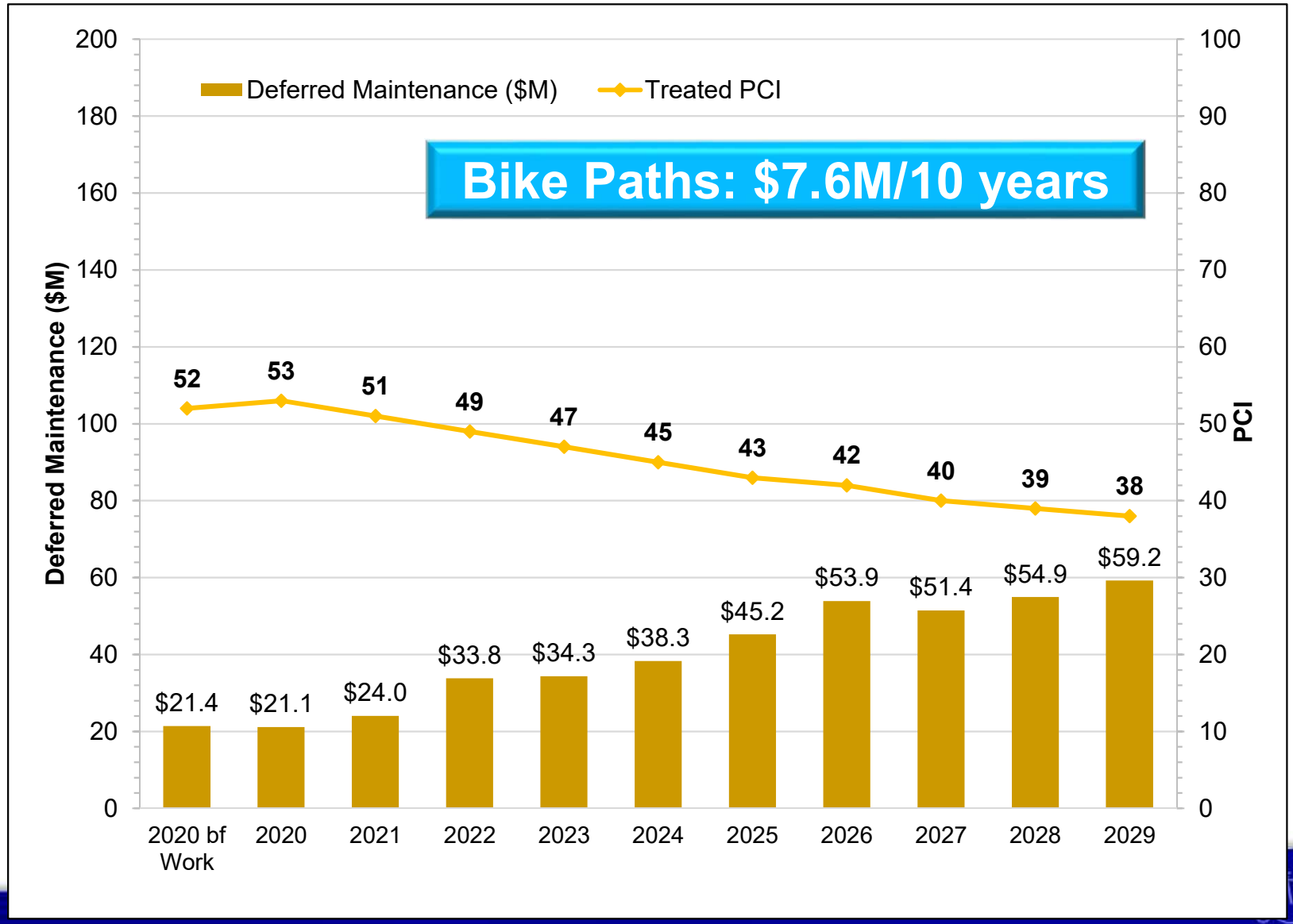
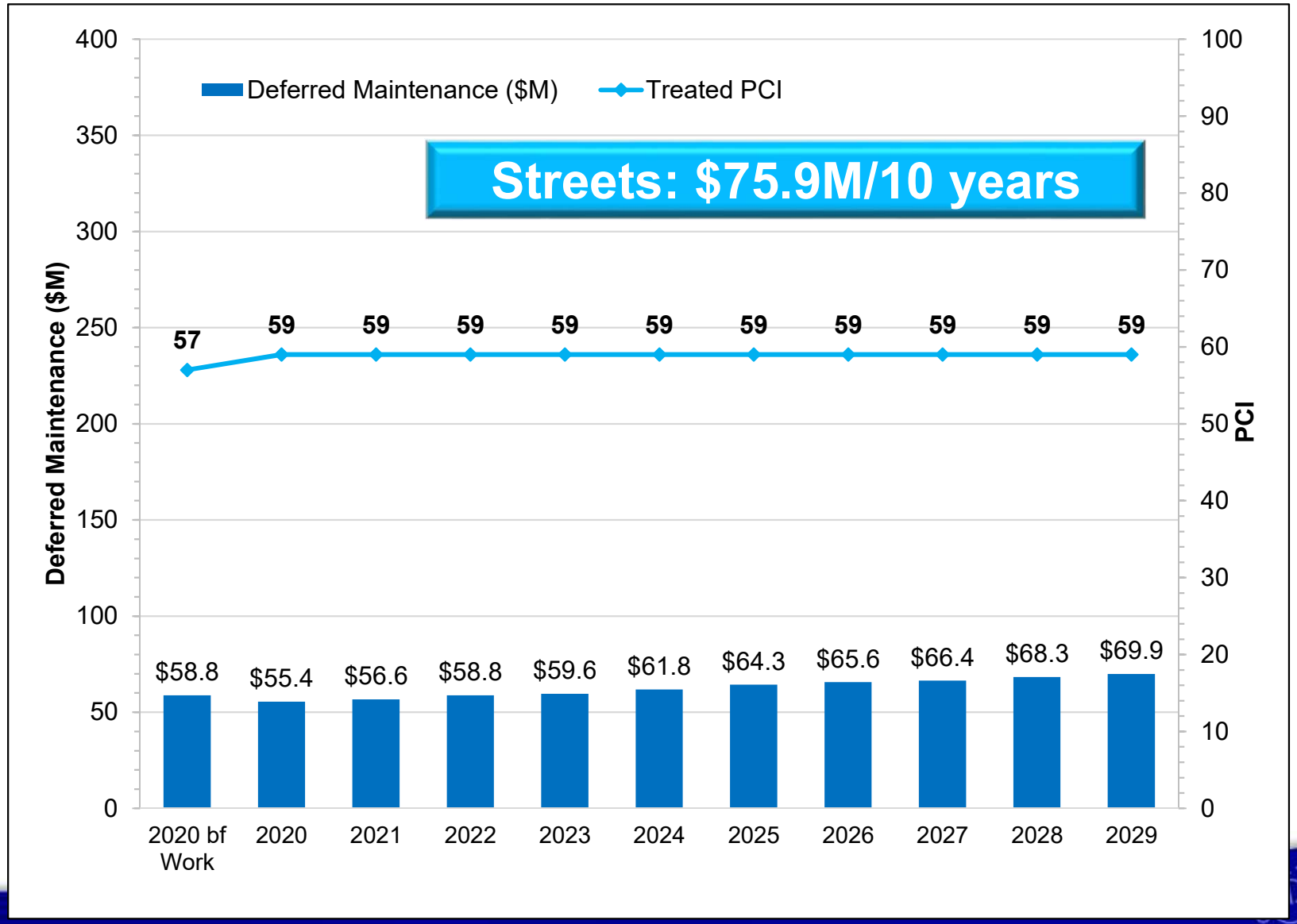


Scenario 3: Maintain Current PCI



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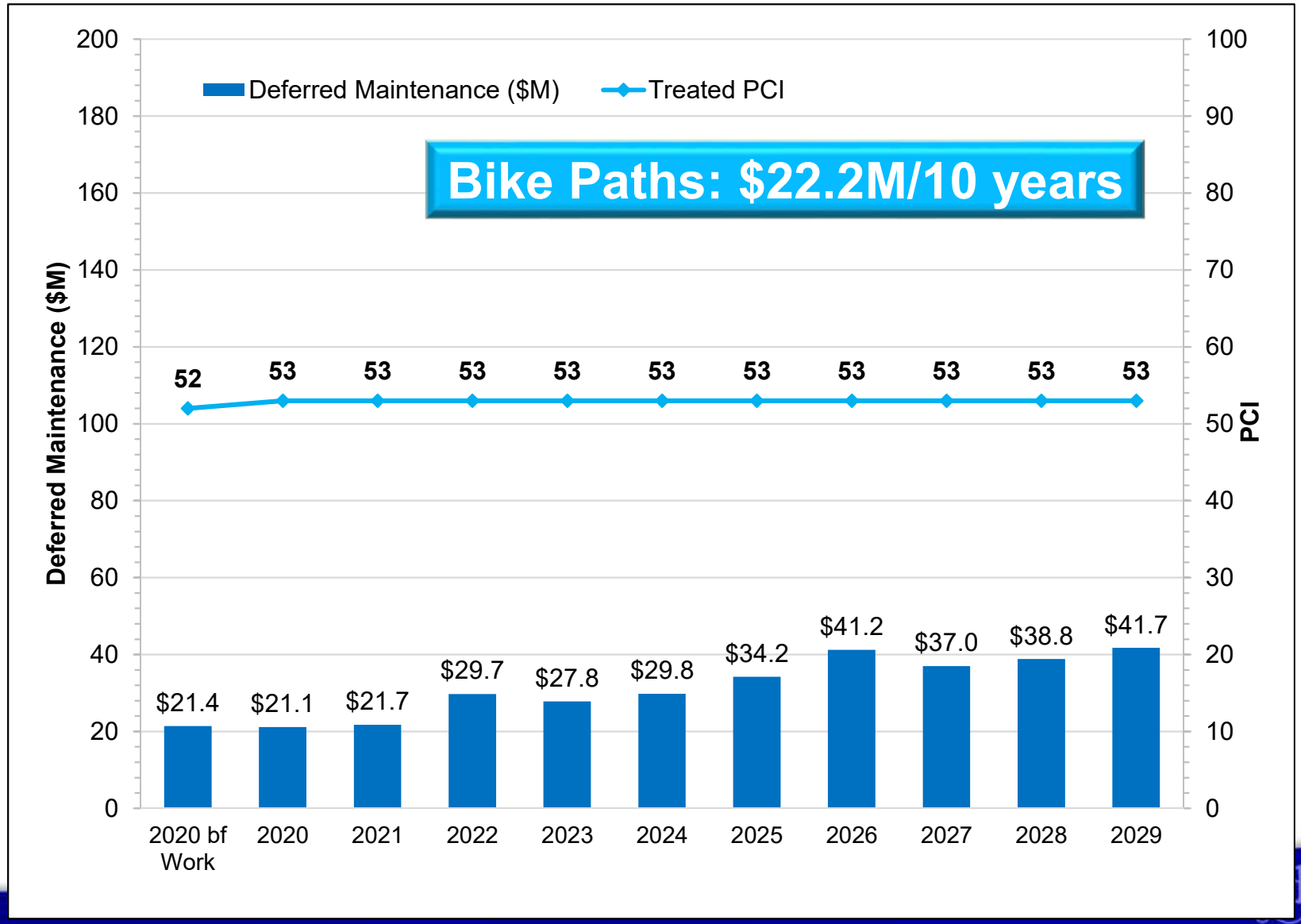
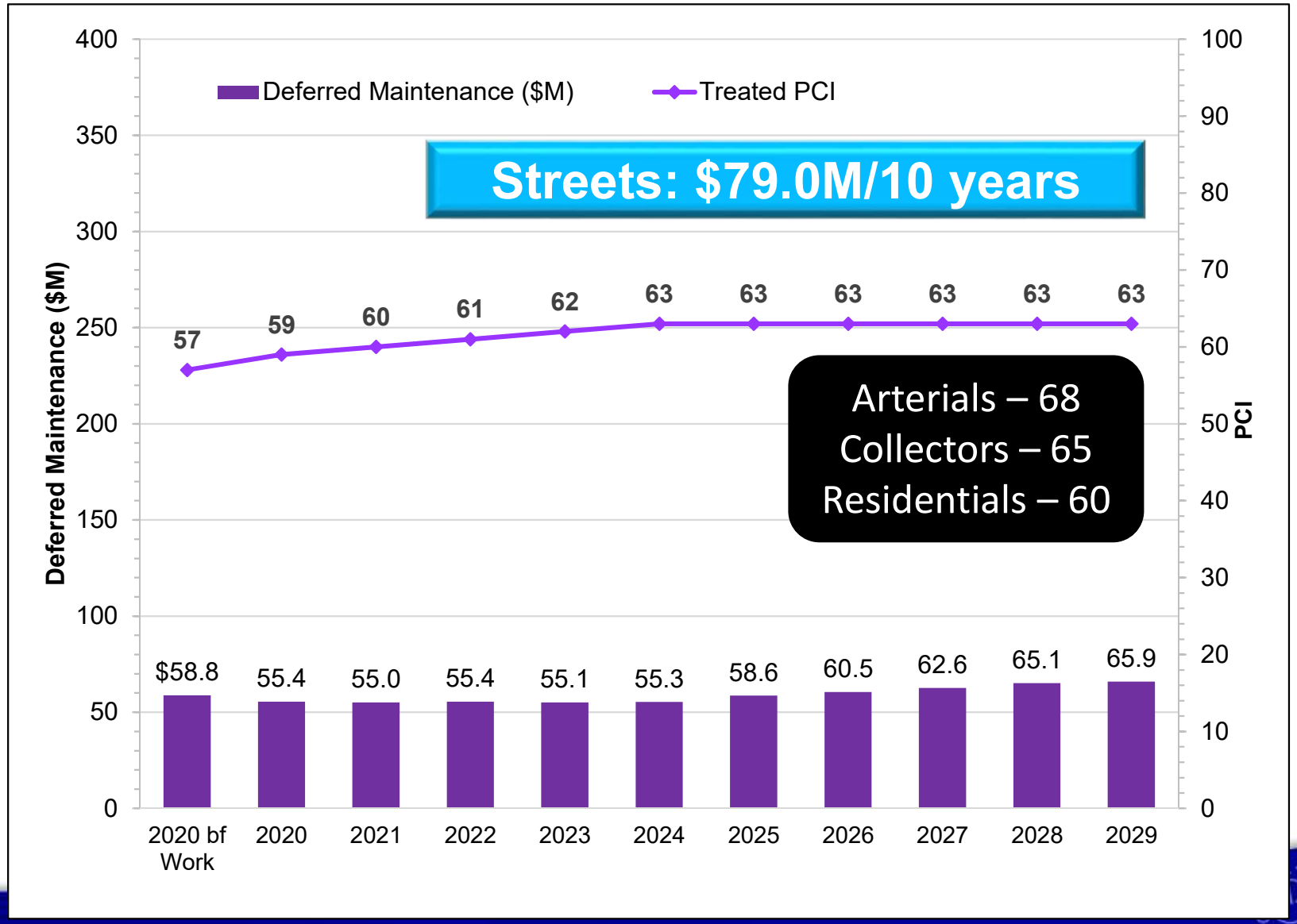


Scenario 4: Improve to Target PCIs



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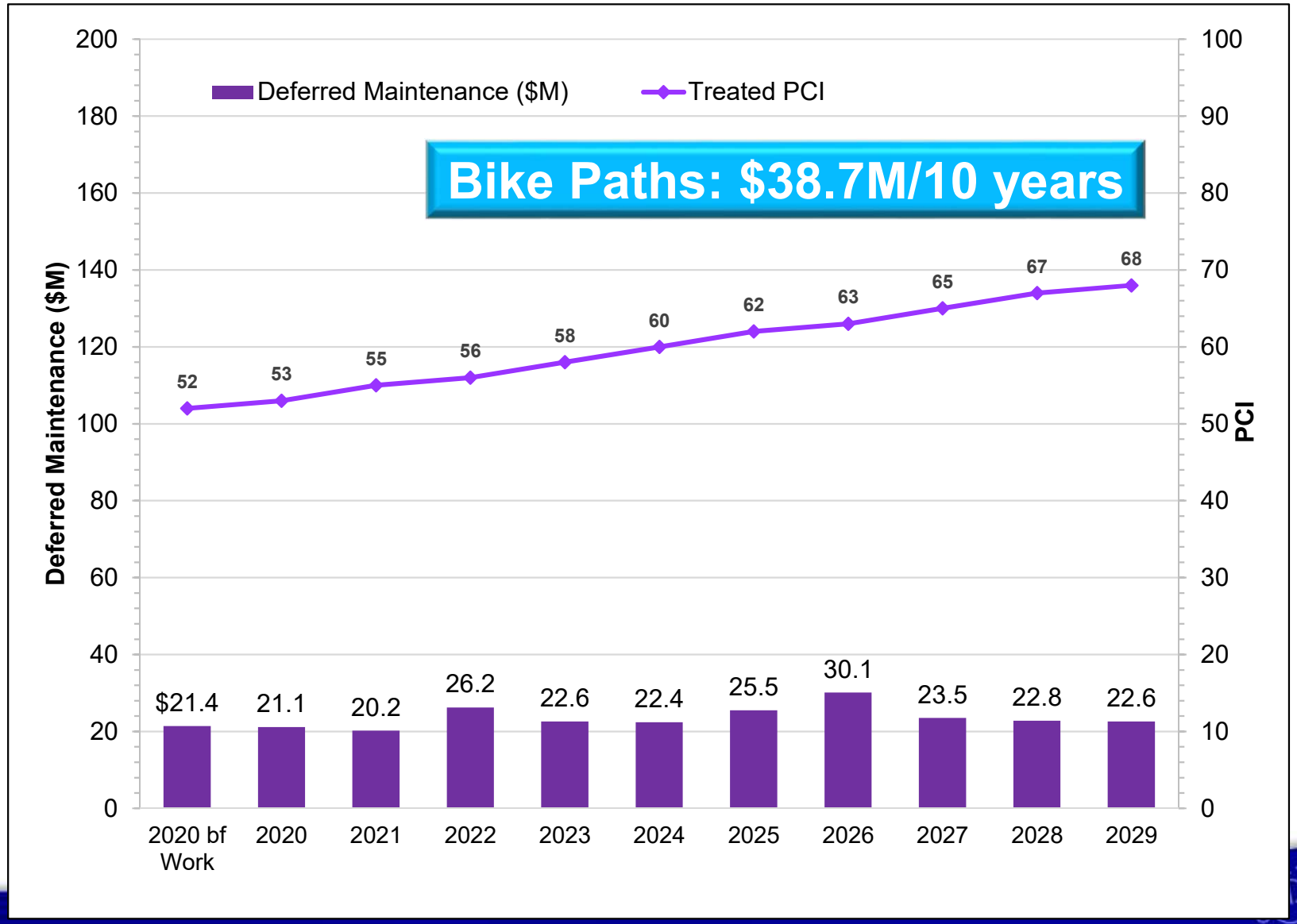
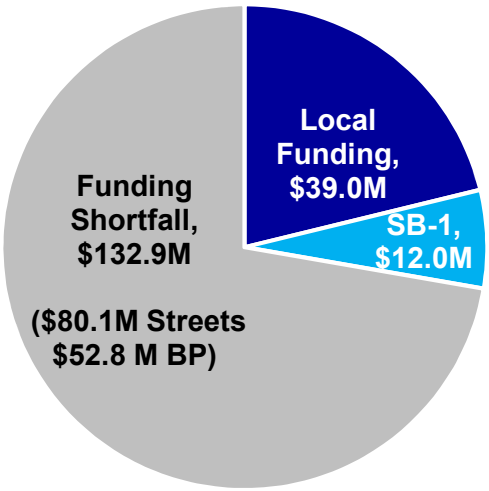


10-Year Funding Shortfall

S1: Fix Everything

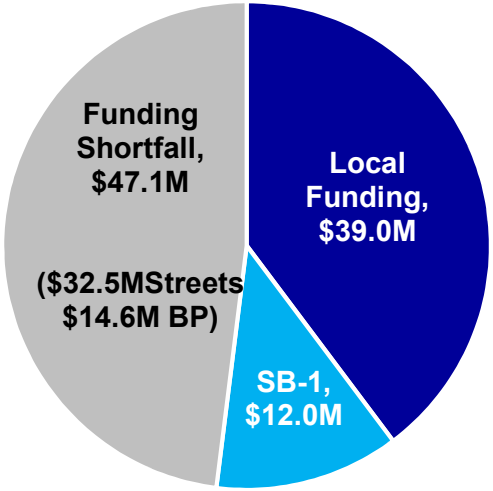


S2: Maintain Budget

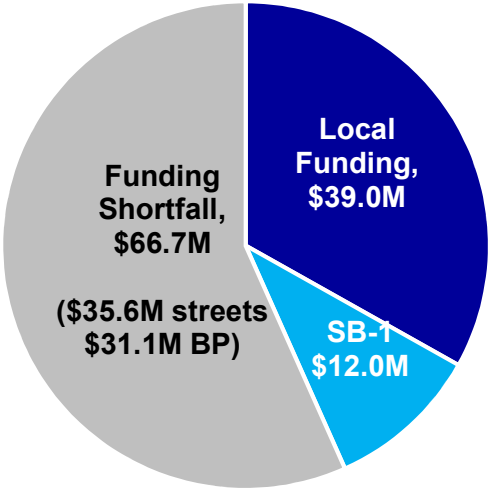
Funding Shortfall = 0

Maintaining current Budget

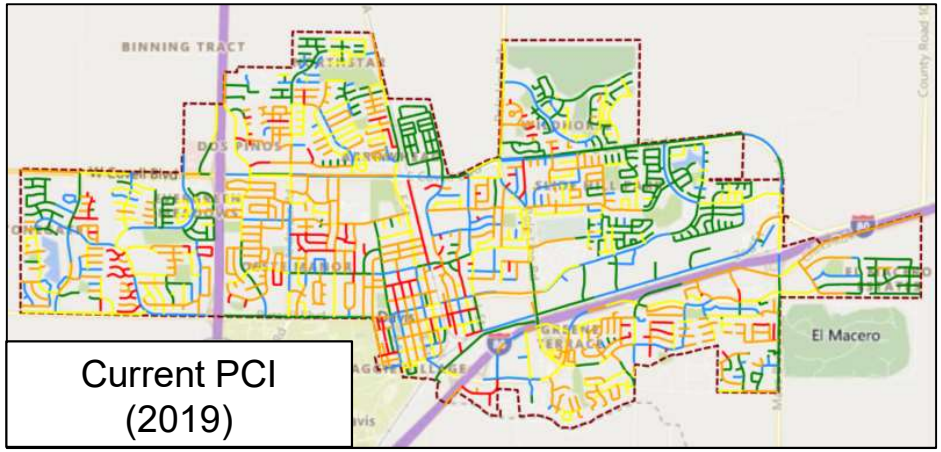
S3: Maintain PCIs



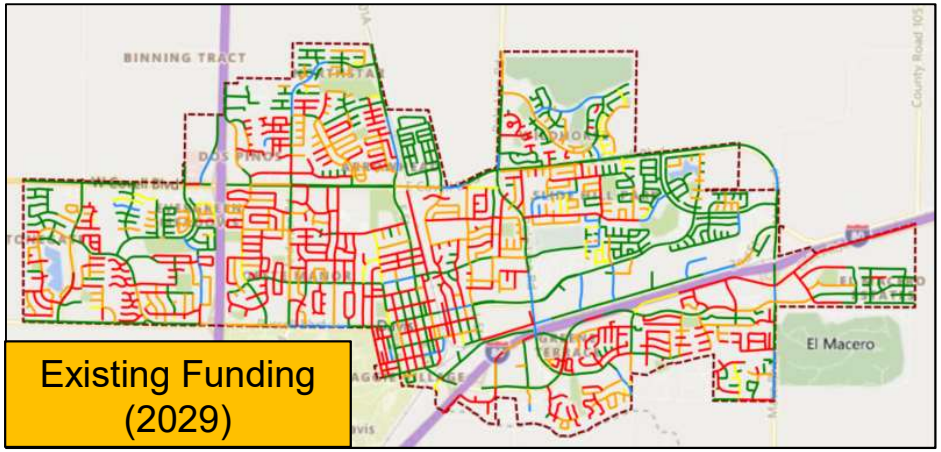
S4: Improve to Target PCIs



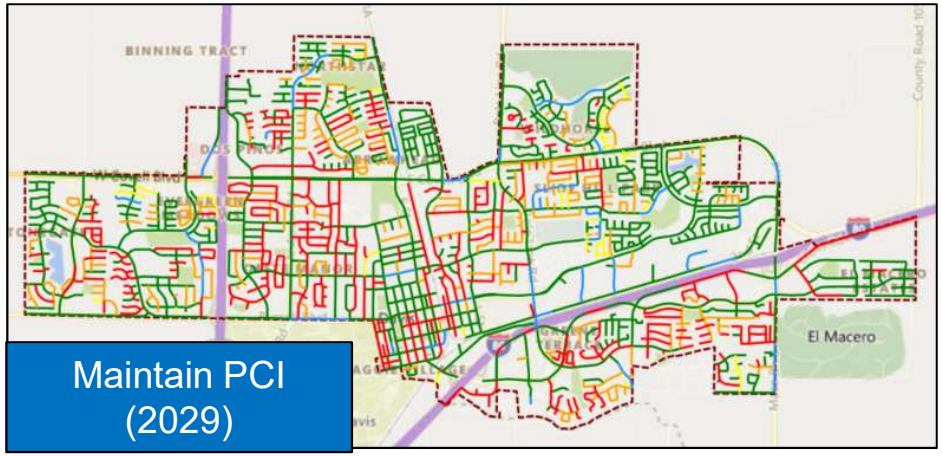
Street Network Condition



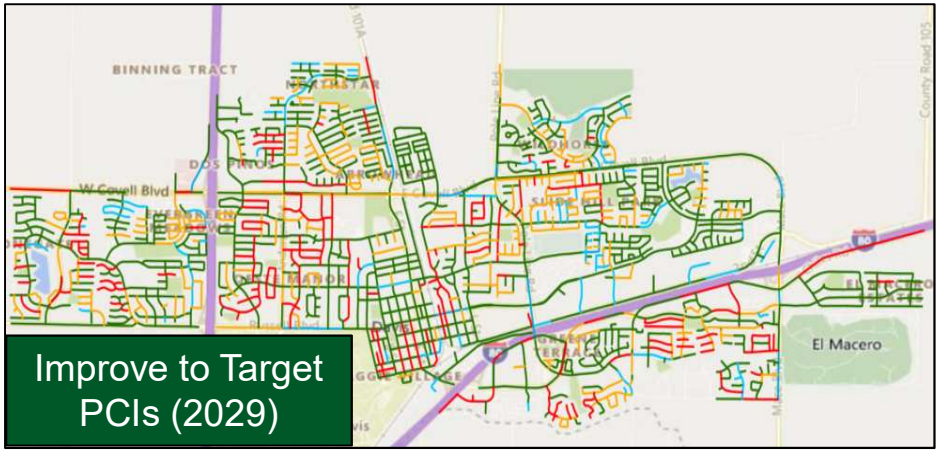
Current PCI (2019)



Existing Funding (2029)

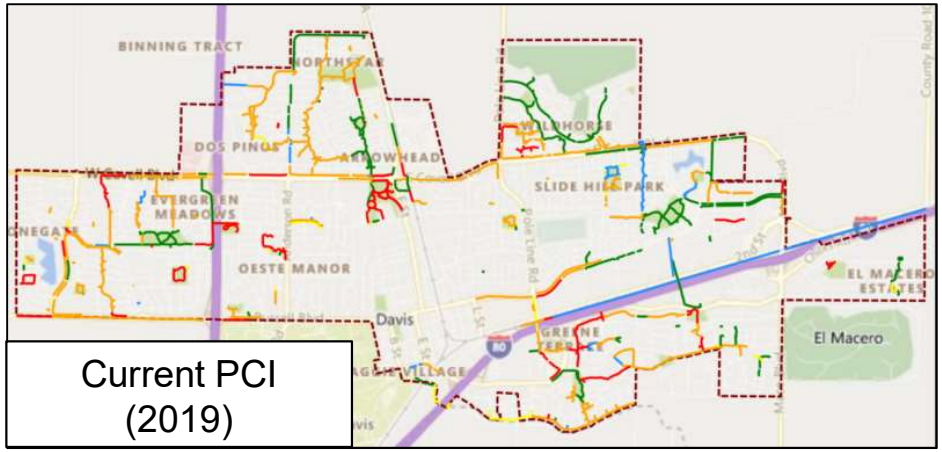


Maintain PCI (2029)

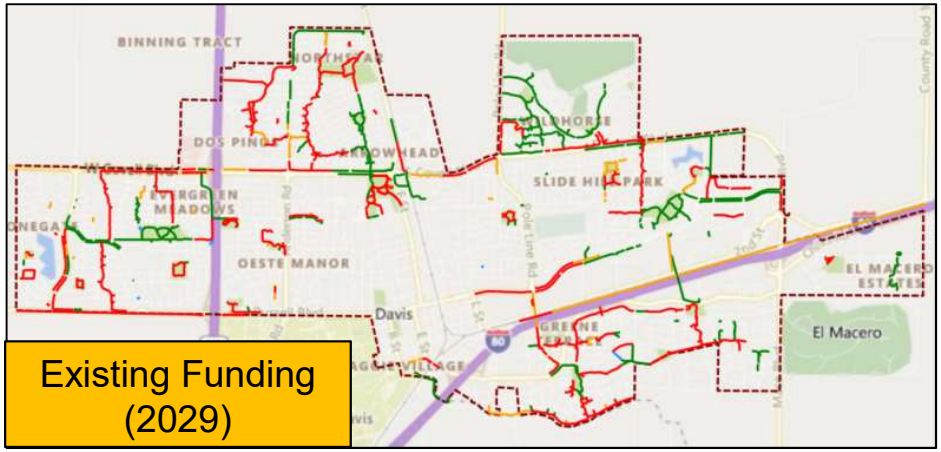


Improve to Target PCIs (2029)

Bike Path Network Condition



Current PCI (2019)



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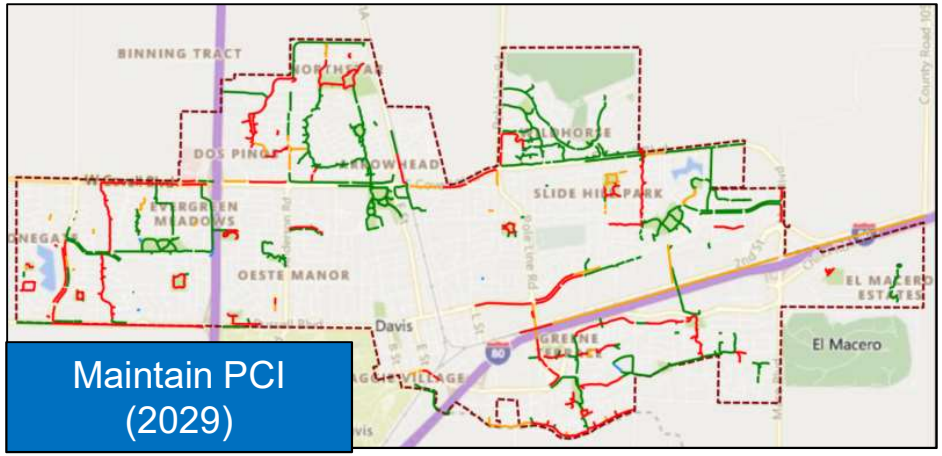

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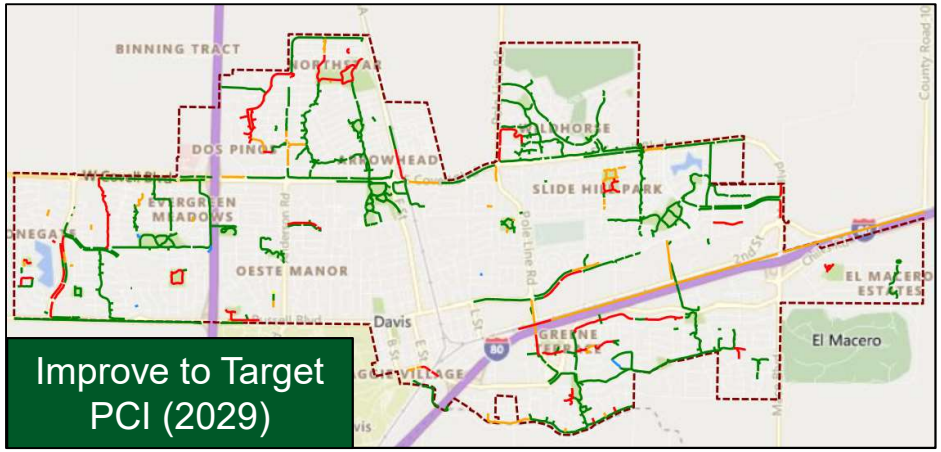

Improve to Target PCI (2029)

Additional Selection Criteria

- Data including safety and maintenance considerations and citizen reported problems
- Engineering judgment
- Coordination with stakeholders
- Creation of a formula using the additional information

Street Criteria

- Coordination with infrastructure and development projects
- Safety considerations: Presence of bike lanes; major/safe pathways to schools; proximity to fire stations, police stations, hospitals
- Maintenance history: work order history, service requests
- High Use/Level of Service: presence of public transportation routes or bus stations and traffic count data
- Grouping of projects for efficiency purposes

Street Formula

(0.3*Safety1 Total) + (0.35*Maintenance Total) + (0.35*High Use Total) = Total score

Street Section	PCI	Functional Class	Length of segment (LF)	Safety 1 (30%)			Safety 2 (as needed)			Maintenance (35%)		High Use (35%)		TOTAL
				Major/safe pathway to school (40)	Presence of bike lane (20)	Emergency response routes/ proximity to hospital/PD/ fire (40)	Recent accidents/injuries related to pavement condition (20)	ADA issues (40)	Condition of curb/gutter/sidewalks (40)	Complaints and Requests (10 points each, 100 max) (30%)	Work orders since 2016 (100) max work orders 10 or more (70%)	Bus/transit routes (60)	Traffic counts (max ADT) for arterials about 26000 (40 points total)	Out of 100
Denali Drive – Shasta to west of Bryce Lane	72	A	1365	40	20	0	?	30	20	0	0	0	(1428/26000)*100 = 5.5% *40 = 2.2	(0.3*60)+(0.35*((.30*0)+(.7*0)))+ (0.35*2.2)= 18.77
F Street – 4th to 7th Streets	73	A	1486	40	20	40	?	30	20	0	50 (5 work orders)	60	(6487/26000)*100=25%* 40=10	(0.3*100)+(0.35*((.30*0)+(.7*50))) + (0.35*70)= 66.75
FStreet- Covell Pond south end to North City Limit	51	A	1825	0	20	0				0	20	60	(3135/26000)*100=12%* 40=4.8	(.3*20)+(0.35*((.30*0)+(.7*20))) +(.35*64.8)=33.58
Fifth Street - 150' E/o F St to RR Tracks	52	A	125	0	20	0				0	10	60	(14680/26000)*100=22.6	(.3*20)+(0.35*((.30*0)+(.7*10)))+ (.35*82.6)=37.36

Bike Path Criteria

- Coordination with infrastructure and development projects
- Pavement Condition Index Classification
- Safety considerations: Major/safe pathways to schools
- Maintenance history: work order history, service requests
- Grouping of projects for efficiency purposes

Bike Path Formula

(0.5*(100-PCI)) + (0.25*Safety) + (0.25*Maintenance Total) = Total score

BIKE PATHS										
Bike Path Section	Length of segment (LF)	Width (FT)	Area (SF)	Surface Type	PCI (50%)	Safety 1 (25%)	Maintenance (25%)		TOTAL	Notes: accidents, injuries, tree roots and proximity to path, width constraints, utilities
					Out of 100	Major/safe pathway to school (out of 100)	Complaints and Requests (10 points each, 100 max)	Work orders since 2016 (100) max work orders 10 or more	Out of 100	
Anderson Rd - Covell Park #12 -H GB to Barcelona Ave	153	10	1530	AC	60	100	0	0	(0.5*(100-60)) + (0.25*100) + (0.25*(0+0))= 45	
Burr Street - Burr Street to Westwood Park	154	15	2310	PCC	66	100	0	0	(0.5*(100-66)) + (0.25*100) +(0.25*(0+0))= 42	

Conclusions

- City has a substantial investment in the street and bike path network ($375 Million)
- Overall the network is in “Fair” condition
  - Street PCI = 57
  - Bike Path PCI = 52
- Existing budget ($5.1M/year) is insufficient
  - PCI will deteriorate to 49 (Streets), 38 (Bike Paths)
  - Deferred Maintenance will increase to $172.4 Million
  - By 2029, 29.6% of streets, 49.7% of bike paths will be in “Failed” condition
- Explore additional funding opportunities and cost savings measures

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