



Pavement Management Program

Department of Public Works

City Council Port, Transportation and Infrastructure Committee Meeting

July 14, 2021

Pavement Management Plan

- Cities are required by Federal, State, and Regional Planning Agencies to develop and adopt a Pavement Management Plan (PMP)
- To maintain funding eligibility, arterial/collector streets must be re-inspected every two (2) years, along with an update to the PMP
- The PMP plans for the maintenance and repair of the City's street network to optimize pavement conditions



Inspection and Equipment

- **Latest technology:**

- Laser Crack Measurement System 2(LCMS2)
- Falling Weight Deflectometer (FWD)

- **Inspection:** Digital scanning of the roadway surface and deflection testing on the roadway structure

- **Objective Data:** Used to develop a Pavement Condition Index (PCI) score ranging from 0-100 for each street segment



Pavement Condition Index (PCI)

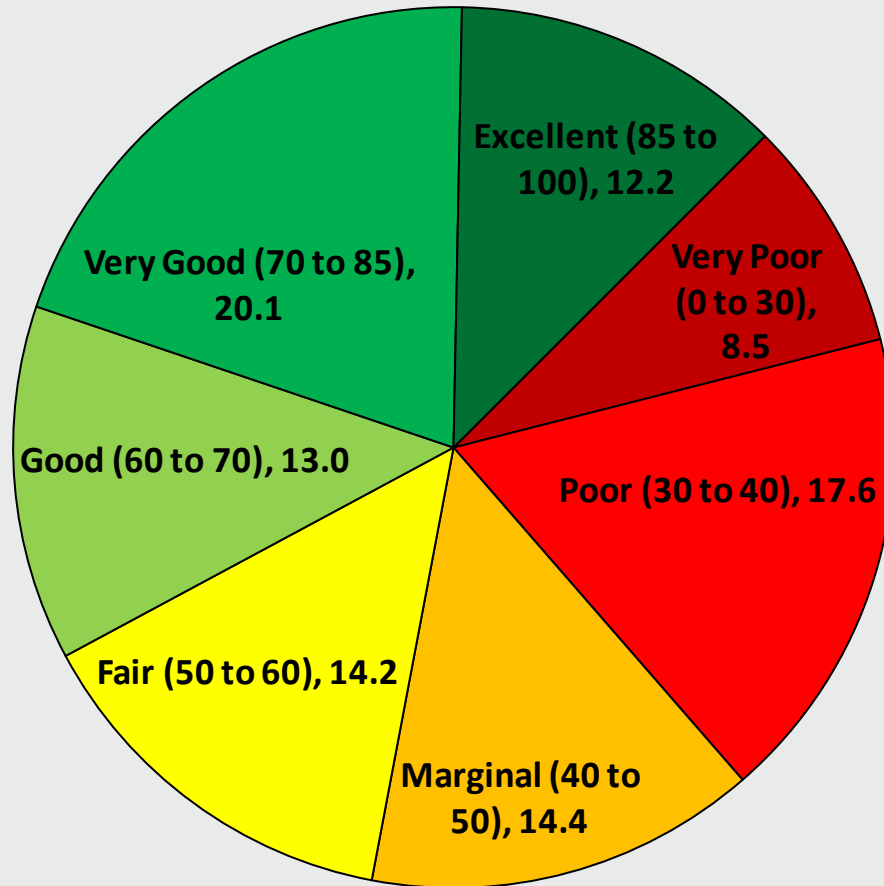
PCI Range	Rating	Relative Avg. Cost per Sq. Foot*	Repair Approach	Streets in This Condition
85-100	Excellent	\$0-2 per sq. foot	Like new condition. Little to no maintenance required. Routine maintenance as-needed.	12.2%
70-85	Very Good	\$2-3 per sq. foot	Routine maintenance such as patching and crack sealing with surface treatments such as seal coats or slurries.	20.1%
60-70	Good	\$3-10 per sq. foot	Heavier surface treatments and thin overlays. Localized panel replacements.	13.0%
40-60	Fair to Marginal	\$10-17 per sq. foot	Optimum timing for thin to moderate overlay. Early lower costs to repair with greater returns.	28.6%
30-40	Poor	\$17-25 per sq. foot	Partial structural failure. Sections will require very thick overlays, surface replacement, base reconstruction, and possible subgrade stabilization.	17.6%
0-30	Very Poor	\$25-30 per sq. foot	Structural failure. Requires reconstruction which is the most expensive and impactful repair method.	8.5%

* Avg. cost is provided as references for asphalt concrete roadway only, actual costs vary greatly depending on actual field conditions and associated concrete improvements required to be improved.

Current Pavement Conditions

City of Long Beach, CA

Network Overview of Pavement Condition (PCI Range, %)



Est. Total Network Mileage = 1010.1 Miles

Overall Network PCI = 58

Overall Backlog = 26%

PCI: Poor (0-30) - Example



- 9% of the City's Network
- Base and/or structural failures with rutting and excessive cracking
- Past point of overlay-based rehabilitation
- Full-reconstruction is the most expensive and most impactful of all rehabilitation methods

PCI: Poor (30-40) - Example



- 18% of the City's Network
- Portion of base and/or structural failures with rutting and excessive cracking
- Very little structural integrity left
- Requires partial to Full-reconstruction

PCI: Marginal to Fair (40-60) - Example



- 28% of the City's Network
- Progressive cracking, few base failures, and localize distresses
- **Optimum** timing for thin to moderate overlay treatments
- Many benefits to selecting these streets: early lower costs to repair with greater returns

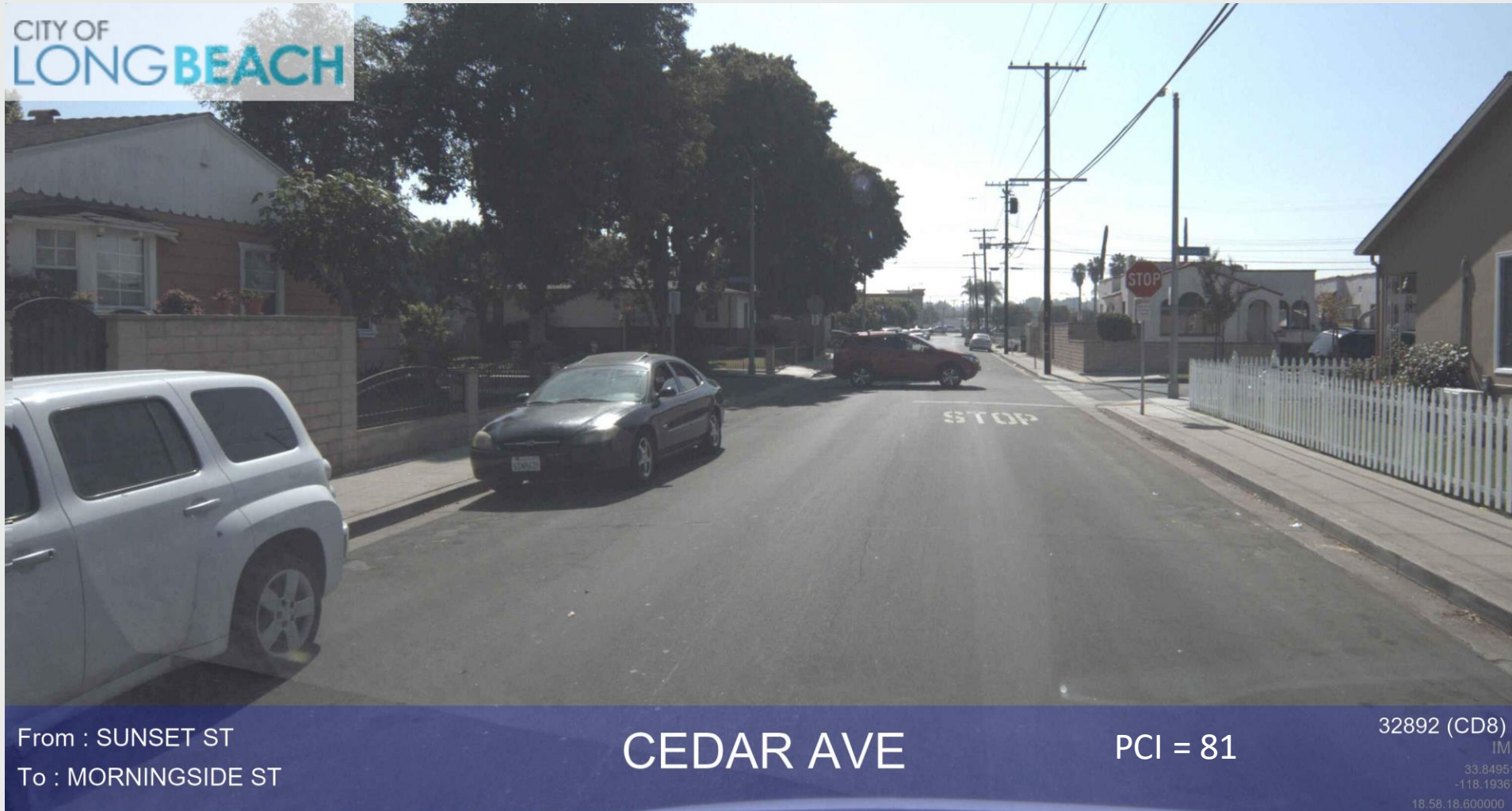
PCI: Good (60-70) - Example

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- 13% of the City's Network
- Few distresses with no rutting or base failures
- Maintenance typically includes thin overlay or slurry seal
- With patch repairs, can be eligible for slurry seal treatment
- Last chance for slurry seal for roads with limited load associated distresses

PCI: Very Good (70-85) - Example



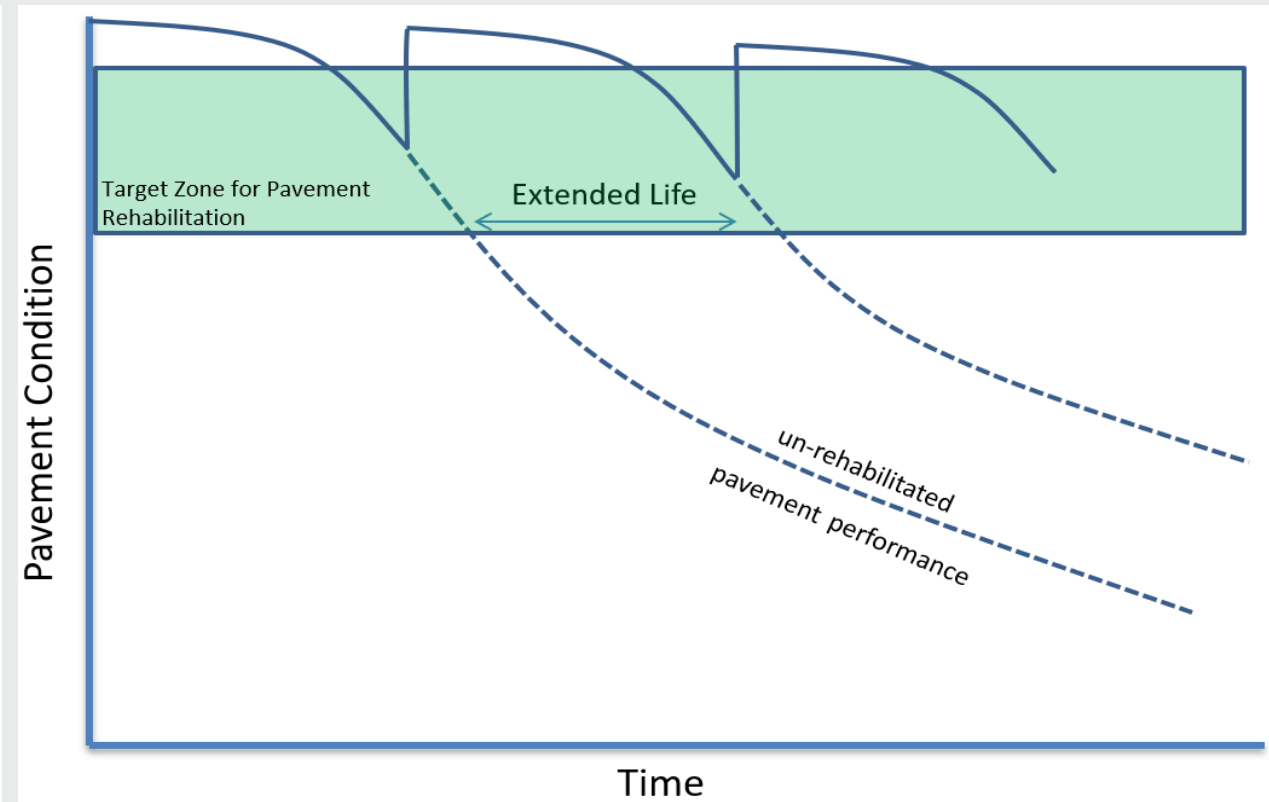
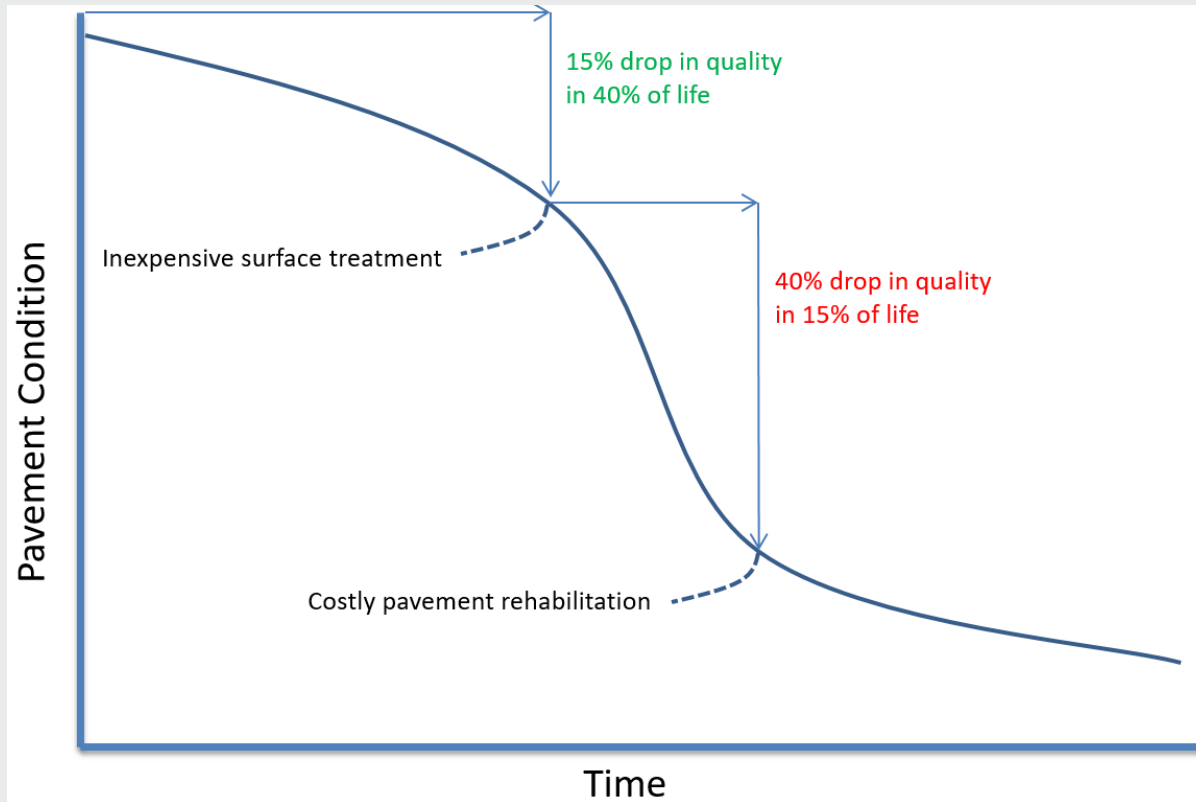
- 20% of the City's Network
- Very few distresses with no rutting or base failures
- Maintenance typically includes crack sealing and slurry seal
- **Optimum** time for slurry seal treatment extends pavement life at lowest cost

PCI: Excellent (85-100) - Example



- 12% of the City's Network
- Like new condition with few minor distresses
- Offers a smooth ride and good drainage
- Should last 5 to 10 years before first slurry seal treatment

Pavement Deterioration and Life Cycle Costs



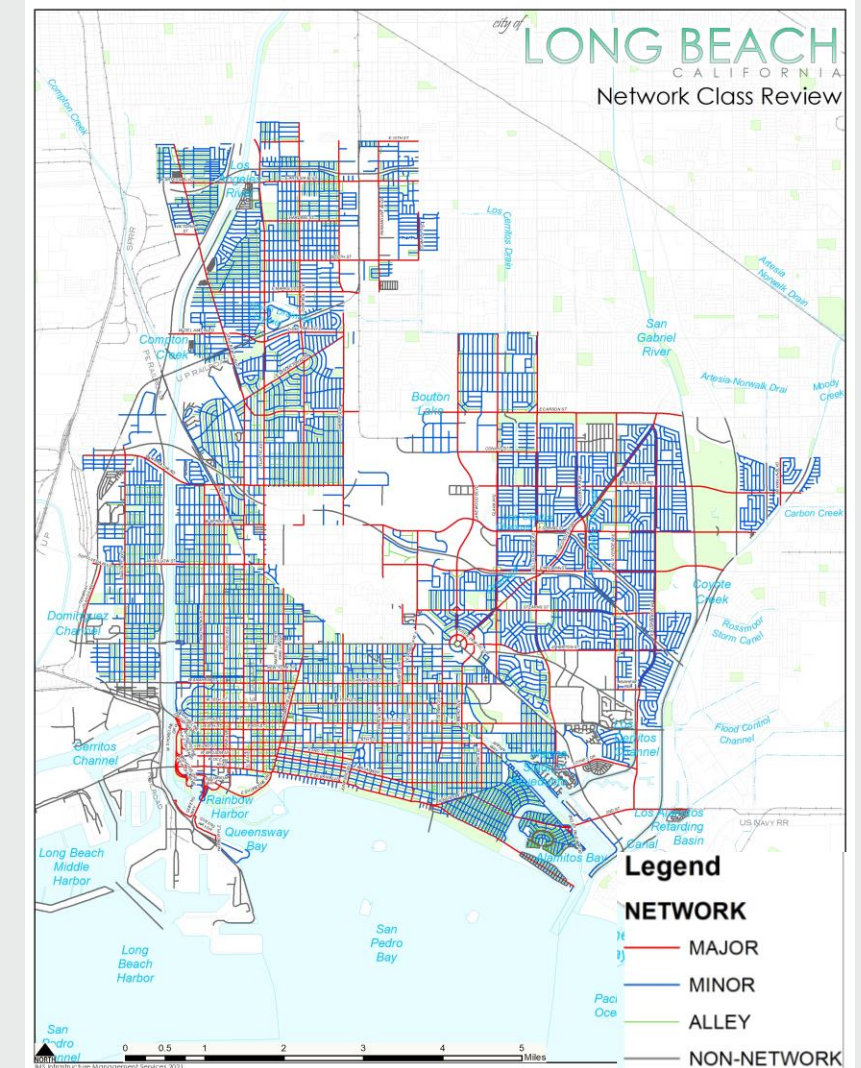
Maintaining streets in the **“Good to Very Good”** and **“Fair to Marginal”** categories provides the greatest value and extends pavement life at the lowest cost.

Long Beach Street Network Replacement Value

Network	Length (Centerline miles)	Replacement Value (in millions)
Major	171	\$988
Minor	624	\$1,712
Alleys	215	\$223
TOTAL =	1,010	\$2,922

*2018 Replacement Value \$2,259 Millions

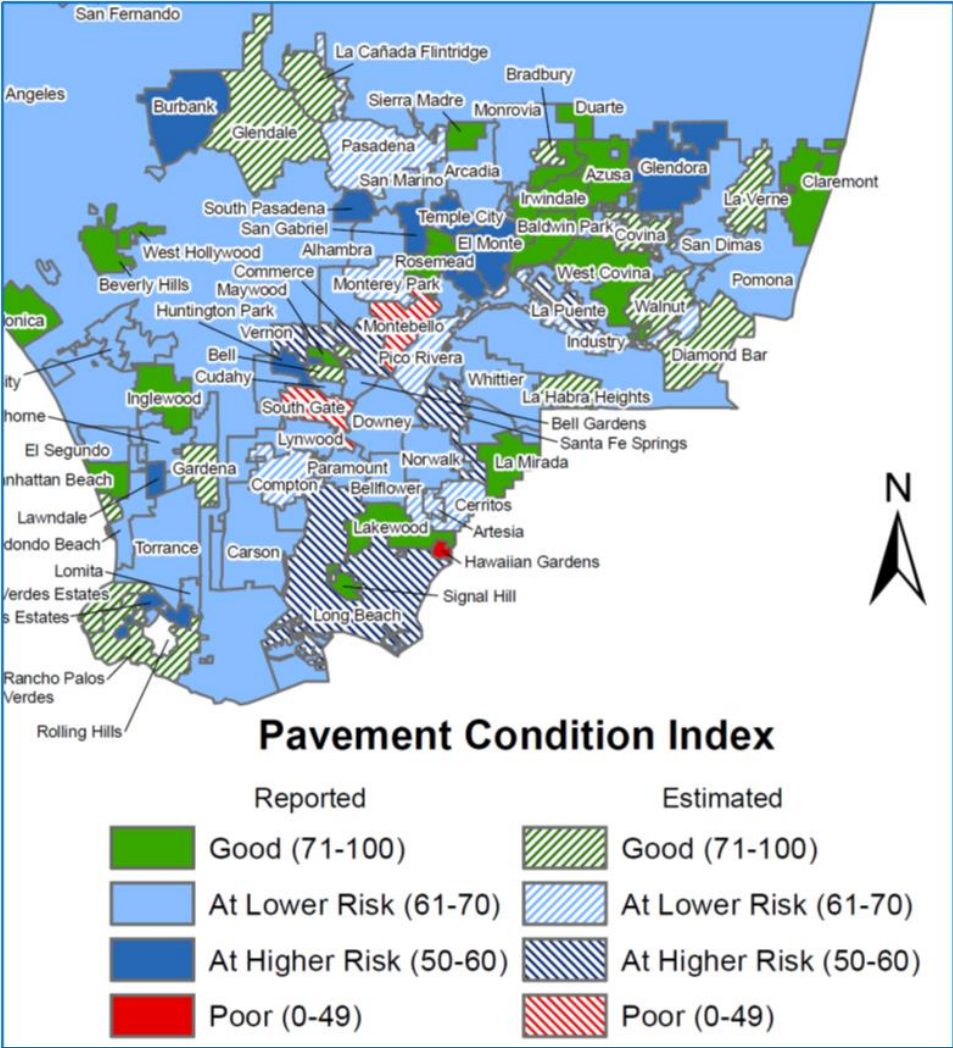
**Cost of Construction Continues to Increase



Current and Past Network PCI

	2018	2020
LB Network Average	58	58
Major	63	64
Minor	56	55
Alley	55	49
Backlog (%)	21	26

	2018
Statewide Avg. PCI	65
LA County (Including Cities)	67



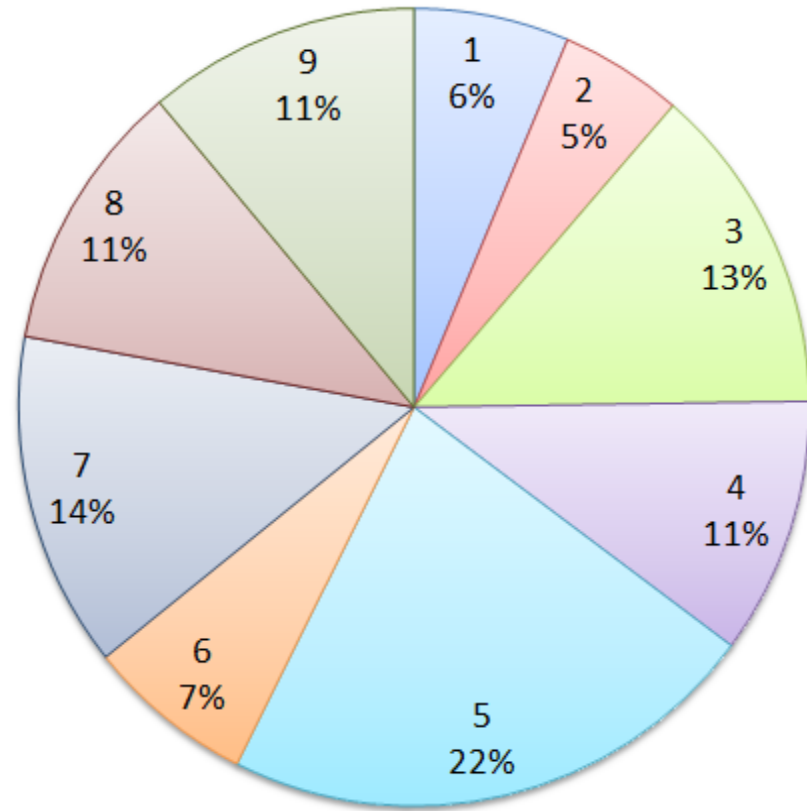
Ref: <https://www.savecaliforniastreet.org>

Budget Requirements to Fix All (achieve PCI of 85 in 5 years)

Required Investment to achieve PCI of 85 in 5 years*

Major	\$559M
Minor	\$1,083M
Alley	\$128M
Total Fix All Cost	\$1.770B

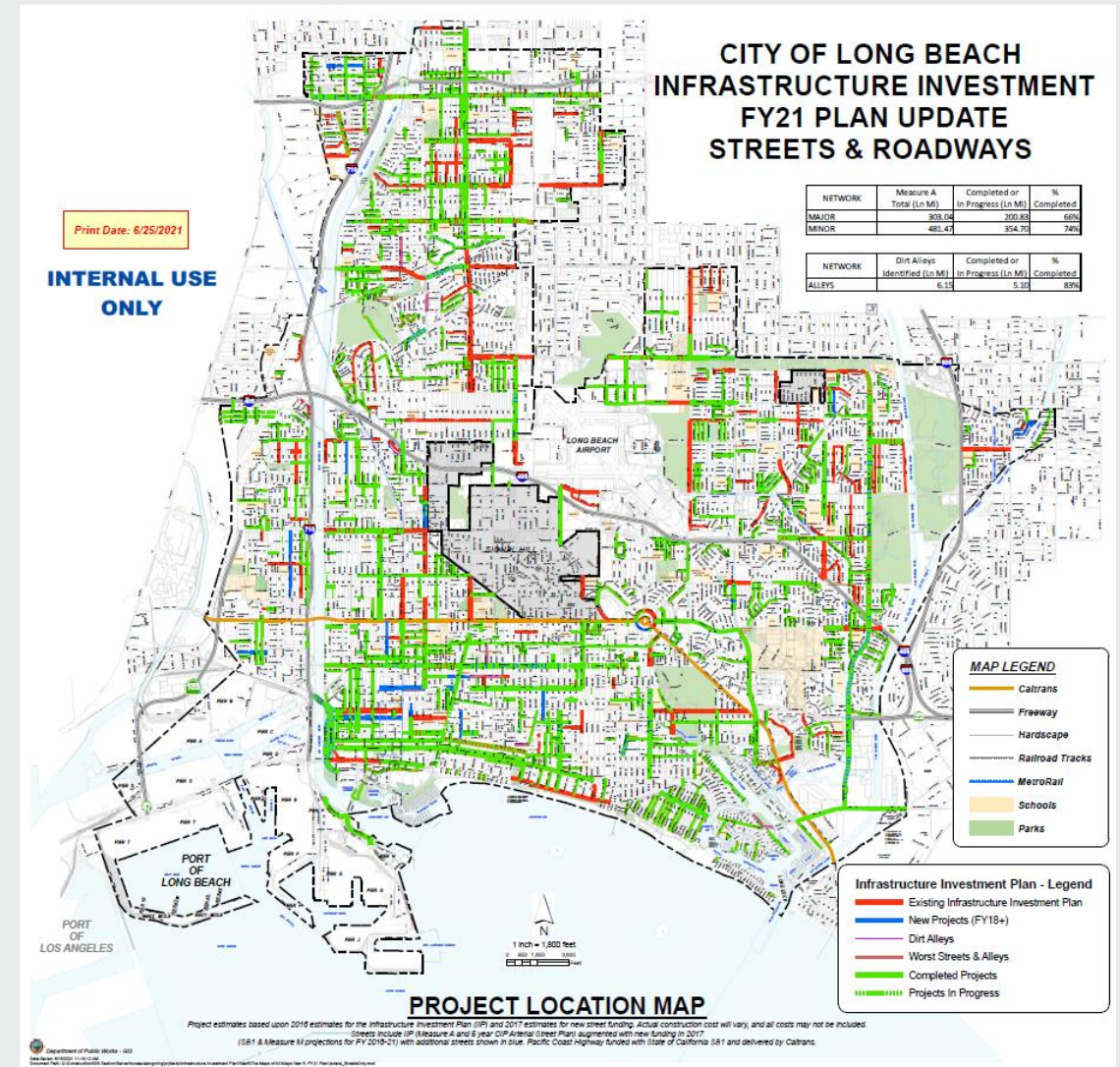
% Need per District (Minor Roads) Breakdown of the required budget to fix all Minor roads per district



*Costs based on preliminary 2021 analysis, may get updated by the end of the project

Prioritization Methodology

- PMP intends to program streets for maximum cost efficiency.
- 2018 PMP adjusted the methodology to prioritize Measure A and Senate Bill1 (SB1) commitments.
- Commitments shown on Infrastructure Investment Plan (IIP) Map located on the City's Measure A website
- Our progress with the Measure A Map (as of 6/25/2021):
 - Major = 66% complete
 - Minor = 74% complete
 - Alleys = 83% complete
- 230 Lane Miles Remaining on Measure A Map



5-Year Street Investment History (in millions)

	FY17	FY18	FY19	FY20	FY21
Major & Secondary	\$15,740,000	\$18,527,624	\$12,000,000	\$15,996,033	\$12,700,000
Local & Residential	\$4,900,000	\$12,107,058	\$17,073,000	\$18,949,093	\$10,899,000
Alleys	\$300,000	\$1,800,000	\$1,800,000	\$1,100,000	\$1,200,000
Slurry Sealing	\$13,080,000	\$2,670,000	n/a	n/a	
Worst Streets & Alleys	n/a	n/a	n/a	n/a	\$5,600,000
TOTAL	\$34,020,000	\$35,105,682	\$30,873,000	\$36,045,126	\$30,399,000

Slurry Seal Program

- Roadway Network loses an avg. of ~2 PCI points annually
- Counteracting the average loss in PCI:
 - Slurry Seal Program can keep pavement in Good to Excellent Conditions longer
 - Slurry seal program would need to address ~105 Centerline of roadway annually
 - Roughly \$35M annual investment
 - Slurry seal does not improve pavement integrity
 - Allows the Major and Minor Street Programs to effectively improve the City's average PCI

- Includes a **5-year Paving Program**
 - Prioritizes completing the Infrastructure Investment Plan
- Creating a public facing GIS tool which will show details of their street, its condition, and when it is programmed for paving
 - Summer 2021



Thank You!

Eric Lopez
Director, Public Works Department