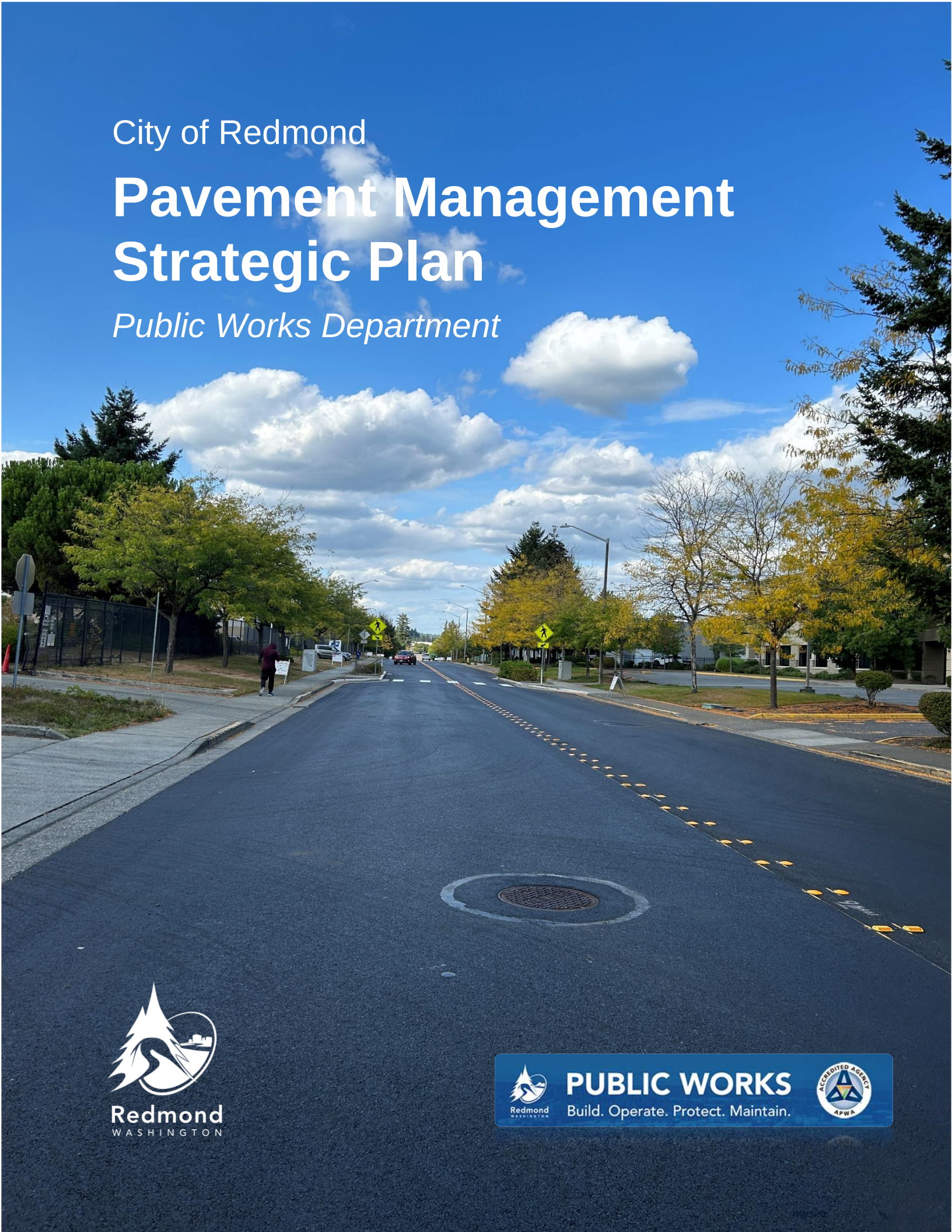
City of Redmond

Pavement Management Strategic Plan

Public Works Department



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Executive Summary

The City of Redmond's street network is a critical public asset that supports the daily movement of residents, businesses, and visitors. With over 362 lane-miles of roadway and a replacement value of $450 million, the network is essential for mobility, economic vitality, and quality of life. However, Redmond's pavement condition has steadily declined over the past two decades, and the City faces a pivotal moment: without significant changes in funding and management strategy, the network will continue to deteriorate, resulting in higher costs, reduced safety, and lower community satisfaction.

The City currently has a significant annual funding gap of $3 to $4 million needed to reverse the decline and move the City towards a sustainable condition for the health of the City's street network. The Pavement Preservation Strategic Plan discusses the current condition of the street network, and identifies the data and strategies to fund a program that will reverse this decline and move towards an acceptable level of service.

Vision for the Pavement Management Program

The City's Municipal Asset Management Policy (AM_POL_001, adopted October 2025) establishes a citywide framework for managing infrastructure assets — including roads, bridges, and sidewalks — through a systematic, lifecycle-based approach aligned with the Comprehensive Plan and other key City plans. The Policy commits the City to evidence-based investment decisions, defined levels of service, and transparent reporting to ensure long-term sustainability of public infrastructure.

The Pavement Strategic Plan will operationalize the Municipal Asset Management Policy through a formal, data-driven Pavement Management Program that ensures the City's street network is safe, reliable, and sustainably managed for all users. Anchored in lifecycle asset stewardship principles, the program is designed to:

- **Apply evidence-based asset management** to prioritize investments based on condition, service risk, and lifecycle value.
- **Extend asset service life** through proactive maintenance and renewal strategies that prevent costly deterioration.
- **Optimize lifecycle costs** by shifting from reactive repairs to strategic, long-term infrastructure stewardship.
- **Align infrastructure investment with community outcomes,** supporting safety, connectivity, resilience, and equitable service delivery as defined in Redmond 2050.

Why Establish a Formal Program?

A formal pavement strategically funded program will enable Redmond to move from reactive, "worst-first" repairs to a long-term approach that preserves infrastructure investments and delivers measurable improvements for the traveling public.

A formal Pavement Management Program provides the following benefits:

- **Optimizes life-cycle costs** by shifting from expensive emergency repairs to cost-effective preventive maintenance.
- **Improves transparency and accountability** in how funds are allocated and projects are selected.
- **Enables the City to leverage grant funding and coordinate with other infrastructure projects.**
- **Supports environmental sustainability** by maintaining smoother pavements that reduce vehicle emissions.
- **Enhances community satisfaction** by delivering safer, quieter, and more comfortable streets.

Pavement Service Life and Condition Decline

Pavement service life is an important component in pavement management. Service life is the period during which a roadway provides an acceptable level of performance—structural integrity, safety, and ride quality—before major rehabilitation or reconstruction is required. During the early portion of this pavement life cycle, pavement conditions typically decline slowly, as the pavement section is strong and surface distresses are minor and manageable through routine and preventive maintenance. However, as pavements age, the asphalt surface becomes oxidized and brittle, cracking increases, and water begins to infiltrate the pavement structure.

Once pavement begins to age, deterioration accelerates rapidly, marking an inflection point in the pavement life cycle at which condition loss becomes exponential rather than linear. At this stage, relatively small declines in condition correspond to disproportionately larger increases in damage, cost, and required intervention. Pavement that from needing cost-effective preservation treatments to requiring expensive rehabilitation or full reconstruction, significantly shortening remaining service life and increasing long-term financial and operational impacts.

The City is currently at this inflection point and has entered a state of rapid decline in the condition of the street network. Without a committed investment in the City's pavement management program, the rapid decline will continue.

Redmond's Pavement Condition

Pavement condition is typically measured by the Pavement Condition Index (PCI). The PCI is a nationally recognized standardized numerical rating from 0 to 100 that is used to describe the overall health and serviceability of a pavement surface and is associated with a word descriptor, as shown in the table. The PCI and word descriptors are defined by condition descriptions, which are identified in more detail in Section 1.3 of this report.

Pavement management goals are associated with a target PCI rating/word descriptor and are an easy way to measure progress and the condition of the street network.

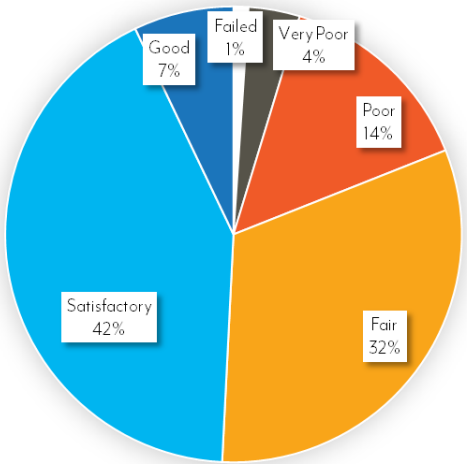
PCI Ratings and Condition Descriptions

PCI	Condition Description
86 – 100	GOOD
71 – 85	SATISFACTORY
56 – 70	FAIR
41 – 55	POOR
26 – 40	VERY POOR
11 – 25	SERIOUS
0 – 10	FAILED

Redmond's network is nearly evenly split between arterials (47.9%) and residential/local streets (52.1%). The PCI scale (0–100) is used to assess pavement condition, with *Satisfactory* defined as PCI 71–85. **The City's minimum target is PCI 71, but the optimal target is PCI 75, which would place the network in the mid-range of *Satisfactory*** and allows for the most cost-effective maintenance, improved safety, and higher user satisfaction.

Redmond's pavement network has dropped from *Good* to *Fair* condition over the last two decades. Principal Arterials, which carry the highest traffic volumes and serve as the backbone of regional mobility, have declined to *Fair* condition, with 38% of lane-miles in *Poor* or worse condition. Residential and local streets, which make up over half the network, have also seen a sharp decline, slipping to *Fair* condition with 12.5% of lanes-miles in *Poor* or worse condition. **If current funding levels and patterns persist, the City's overall street network is projected to slip into *Poor* condition within seven years**.

Pavement Network Condition Ratings



Maintaining pavements at PCI 75 in the *Satisfactory* range enables the City to use preventive maintenance treatments rather than costly rehabilitation or reconstruction, reduces disruptions, and supports environmental sustainability by lowering vehicle emissions through smoother surfaces.

Funding and Budget Scenarios

Over the past six years (2020-2025), Redmond has funded nearly $ 8.2 million (an average of $ 1.7 million per year) in paving projects throughout the City. This funding has been sourced from:

- Programmatic Funding: The City used $2.8million (average $468,000/year) for this program. This funding was used for rehabilitation projects and preventive maintenance treatments for 12.8 lane miles at various locations throughout the City.
- Capital Improvement Program (CIP): The City used $4.2 Million of City funding and $3.2 Million in grants for three CIP paving projects. Total cost for those three projects was $5.4 Million (average $900,000/year) to pave 8.4 lane-miles.

Despite the City's efforts, these funding expenditures have resulted in Redmond's pavement network dropping from *Good* to *Fair* condition. Current funding levels are insufficient to reverse the decline in pavement conditions. Modeling shows that even a $1 million annual increase over the existing $1.7 million budget does little to achieve the City's minimum PCI goal. To reach PCI 71 in 12 years (by year 2039), a base budget of $4 million, with a bi-annual $2 million increase, thereafter, is needed; to reach PCI 75 by 2039, a base budget of $5 million, with a bi-annual $2 million increase, thereafter, is required.

Past pavement funding has been inconsistent, relying on individual paving projects competing against other City priorities for limited resources through the Capital Improvement Program and biennial budget process — resulting in year-to-year variability that has made sustained network improvement difficult to achieve. To reverse the decline in pavement condition and work toward the City's PCI goals, this Plan recommends establishing a dedicated, standalone programmatic paving budget that is funded consistently as a program and does not compete with other City capital projects. The recommended budget is $5 million annually beginning in 2027, with a $250,000 increase each year through 2039 — identified as the "Proposed Budget" in Table 8 in Section 4.2. While this funding level alone is not sufficient to achieve the minimum target of PCI 71 or the optimal target of PCI 75 by 2039, the combination of the proposed budget, a potential future establishment of a City paving crew, and pursuit of grant funding is projected to put the network on a trajectory to reach those goals. This integrated approach provides the funding stability and operational capacity needed to prioritize cost-effective preventive maintenance over expensive rehabilitation and reconstruction.

Implementation Strategy

The recommendations and goals established in this Pavement Strategic Plan are carried forward in a separate report, the Pavement Management Implementation Plan. While this Strategic Plan defines the City's pavement condition targets, funding scenarios, and resource needs, the Implementation Plan provides the operational detail necessary to execute those recommendations — including a multi-year budget schedule, project management processes, staffing and equipment resources, and additional key performance indicators (KPIs) to track program success. The two documents are intended to be read together, with this Strategic Plan serving as the policy and investment framework and the Implementation Plan serving as the day-to-day management guide for the programmatic paving program.

The approach centers on:

- Continued use of StreetSaver or other pavement management software for transparent, data-driven planning and project selection.
- Prioritizing arterial rehabilitation (70% of budget) to reverse decline.
- Expanding preventive maintenance and piloting innovative treatments.
- Identifying project locations using Asset Management Principles
- Avoiding "worst-first" approaches in favor of strategic, lifecycle-based investment.
- Establishing a dedicated budget that is separated from the Capital Improvement Projects (CIP) budget.
- Potential future establishment of an internal City paving crew.

Conclusion

Redmond's street network is at a crossroads. Continued decline will result in higher costs, greater disruption, and lower community satisfaction. By adopting a strategic, well-funded pavement management program with clear goals, robust data, and coordinated implementation, the City can restore its streets to *Satisfactory* condition, deliver lasting value to residents, and support the community's vision for a safe, sustainable, and vibrant future.

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1.0 Introduction

The City of Redmond is at a pivotal moment in the evolution of its pavement management program. Over the last decade, City staff have invested in foundational program management activities, including regular updates to the pavement management database, routine pavement condition assessments, and the annual delivery of pavement rehabilitation and preservation projects. These efforts have yielded a set of historical data that clarifies the gap between current funding levels and the sustained, programmatic investment required to achieve and maintain a state of good repair across the City's street network.

Over the past twenty years, the condition of the street network has declined from *Good* to *Fair,* and is trending towards *Poor*, based on the current bi-annual funding projections. Over the past 14 years, patterns in annual expenditure have not kept pace with the City's growth, the shift towards greater transit capacity, and overall cost inflation.

Implementing the City's Pavement Management Strategic Plan, which includes continual management of the City's Pavement Management Program, is a critical next step to ensure that limited funding is used efficiently, roadway conditions are proactively managed, and decision-making is informed by reliable data and long-term planning. Without a strategic plan and sustained investment, the city faces accelerating pavement deterioration, higher long-term costs, and reduced service levels for residents and businesses.

1.1 Recent Accomplishments

Redmond has already laid the foundation for a successful pavement management program through recent accomplishments:

- **Data-Driven Approach:** Since 2008, the City has systematically evaluated the condition of its roadway network. The City's use of StreetSaver software, combined with consistent pavement condition inspections, enables robust, data-driven decision-making. StreetSaver is the system of record for pavement inventory and condition; data is updated biannually following inspection. Redmond partnered with Capitol Asset & Pavement Services Inc. to complete the most recent citywide pavement condition inspection in 2025, including a pilot program with StreetScan for automated data collection using camera-based systems and Artificial Intelligence (AI) analysis. The current baseline use for the information in this Pavement Management Strategic Plan reflects a 2025 assessment by Capitol Asset & Pavement Services, validated against PCI data collected biannually since 2008.
- **Increased Funding Commitment:** The creation of the Transportation Benefit District (TBD) enabled the City's programmatic paving budget to rise in 2023 from $200,000 annually to $500,000 annually. This programmatic paving budget is in addition to TBD allocations made to the Capital Improvement Program and used specifically for pavement projects. Over the last six years, from 2020 through 2025, the City has allocated $2.8 million in programmatic paving funding for preventive maintenance treatments on 12.8 lane miles at various locations throughout the City. In addition, the City also allocated $4.2 million to the paving program through the CIP budget, and an

additional $3.2 million in grant funding was secured. The total actual cost of these CIP projects was $5.4 million, which was used to rehabilitate 8.4 lane miles of pavement. While the programmatic funding increase has allowed the City to increase the lane miles of pavement maintenance and rehabilitation projects, this level of investment remains insufficient to address the street network's backlog and achieve long-term Level of Service goals.

- **Integrated Project Delivery:** Preventive maintenance practices such as crack sealing and slurry sealing have been implemented in residential neighborhoods, with grind and inlay treatments applied where warranted. Internal coordination has enabled additional facility upgrades (e.g., curb ramps, sidewalks, lighting, upgraded accessible pedestrian push button (APS) installations, and utility enhancements).
- **Community Engagement and Transparency:** The City issues bi-annual reports summarizing accomplishments and priorities, installs yard signs at newly paved locations, and tracks public paving requests to ensure community concerns are reflected in the work plan.

1.2 City Street Network Overview

Redmond's street network is extensive and diverse, supporting a wide range of users and transportation modes:

- **Total Inventory:** Approximately **362 lane-miles** (153 centerline-miles) of roadway, with lane-miles varying by segment width and number of drive lanes. As an example of relativity and to demonstrate lane miles, West Lake Sammamish Parkway NE, between Tosh Road and NE Bel Red Road, is 0.53 centerline miles. The majority of this roadway is a 2-lane a center-turn-lane configuration, totaling 1.59 lane-miles.
- **Functional Classifications:**
    - **Arterial Streets:** Principal, Minor, and Collector Arterials (totaling 173.1 lane-miles)
    - **Neighborhood Roads:** Residential/Local Streets (188.5 lane-miles)
- **Pavement Types:** The street network includes concrete, asphalt, asphalt-over-concrete, and five gravel segments.

The street network comprises the classifications shown in Table 1.

TABLE 1. STREET NETWORK CLASSIFICATION AND PAVEMENT STRUCTURE.

Functional Class and Condition	Concrete Lane-Miles	Asphalt Lane-Miles	Asphalt over Concrete Lane-Miles	Gravel Lane-Miles	Total Lane-Miles
Arterial Streets					
Principal Arterial	0	49.9	0.1	0	**50.0**
Minor Arterial	0.5	58.2	2.1	0	**60.8**
Collector Arterial	0.9	60.7	0.7	0	**62.3**
Neighborhood Roads					
Residential/Local Street	0.6	186.7	0.2	1.0	**188.5**
TOTAL	2.0	355.5	3.1	1.0	**361.6**

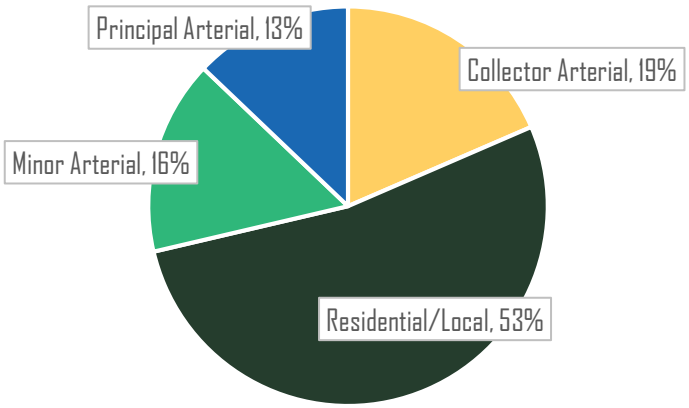


FIGURE 1. PROPORTION OF STREET NETWORK BY FUNCTIONAL CLASS.

The street classification breakdown is essential for prioritizing treatments and understanding the different functional roles that roadways play within the City's street network. Arterials carry higher traffic volumes, connect major destinations, and are more expensive to maintain. Residential and local roads serve neighborhoods and lower-speed environments but still require ongoing preventative maintenance to ensure safety and comfort for users

1.3 Definition of Pavement Condition Index (PCI)

To support objective, data-driven decisions, the City of Redmond utilizes the **Pavement Condition Index (PCI)** to assess the health of its street network. The PCI is a numerical index from **0 to 100** used to indicate the condition of a pavement section, with 100 representing a pavement in perfect condition and 0 indicating complete structural failure. The PCI involves evaluating surface distress by type, severity, and quantity. The City follows national standards in evaluating the PCI of its street network.

The PCI scale is divided into the standard categories shown in Table 2.

TABLE 2. PCI CONDITION DESCRIPTIONS AND RANGES.

PCI	Condition Description
86 – 100	GOOD
71 – 85	SATISFACTORY
56 – 70	FAIR
41 – 55	POOR
26 – 40	VERY POOR
11 – 25	SERIOUS
0 – 10	FAILED

Figure 2 provides graphical depictions of pavement conditions between *Good* and *Poor*. Photographic illustrations of pavement conditions are shown in Appendix E.

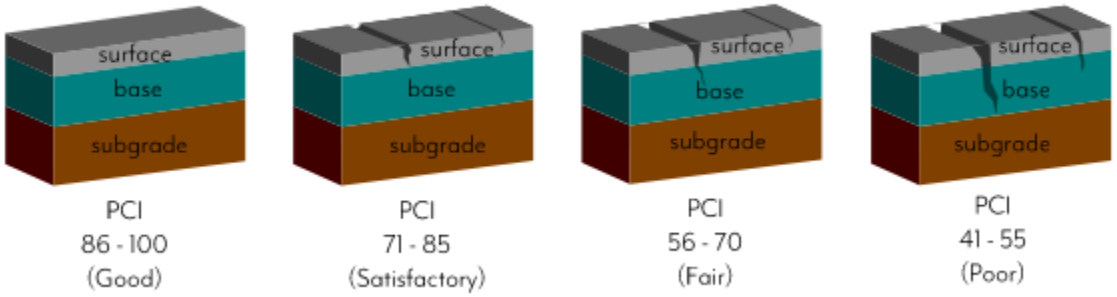


FIGURE 2. PAVEMENT CONDITION DEPICTIONS.

These characteristics are further described in Table 3. A new pavement will have a PCI of 100, and as the distress propagates through the pavement section, the associated deductions increase, and the resultant PCI approaches zero.

TABLE 3. PAVEMENT CHARACTERISTICS AND RECOMMENDED MAINTENANCE BY PCI RANGE.

PCI Range	Condition	Observable Characteristics and Typical Maintenance Need
86 – 100	Good	**Characteristics:** Recent or new pavement with few visible distresses. **Treatment:** Routine maintenance recommended (i.e., seal cracks).
71 – 85	Satisfactory	**Characteristics:** Minor distress. **Treatment:** Preventive maintenance (i.e. seal cracks, chip seal, slurry seal, mill and thin asphalt overlay).
56 – 70	Fair	**Characteristics:** Moderate distress and noticeable aging pavement with some cracking. **Treatment:** Surface rehabilitation (i.e. 2" mill and asphalt overlay).
41 – 55	Poor	**Characteristics**: Significant deterioration — widespread cracking, some full depth distresses. **Treatment:** Rehabilitation (i.e. 2" mill and asphalt overlay with deeper patch repairs).
26 – 40	Very Poor	**Characteristics:** Severe distress — significant and widespread cracking, potholes, surface failure, etc. **Treatment:** Full depth repairs to base layers on large parts of the roadway.
0 – 25	Serious–Failed	**Characteristics:** Extensive failure. **Treatment:** Full reconstruction of pavement base and surface required.

When pavements deteriorate, they require more frequent and disruptive street maintenance, leading to traffic delays and increased costs. Streets with PCI below 40 exhibit widespread distress, including cracking, ruts, and potholes. This requires extensive pavement rehabilitation,

such as full-depth removal and replacement, which is more than four times as costly as preventive maintenance treatments. These major projects often necessitate additional improvements to meet current codes and standards — such as upgrading curb ramps to comply with ADA requirements — further escalating project costs.

The PCI is foundational to Redmond's pavement management approach, enabling the City to:

- Determine pavement treatments based on condition and need
- Model future street network performance under different funding scenarios
- Communicate transparently with stakeholders and the public
- Avoid unsustainable ″worst-first″ approaches by strategically allocating resources across all condition levels to maximize long-term value.

2.0 Existing Condition Assessment

2.1 Roadway Functional Classifications

Understanding the distribution of roadway types within the City of Redmond provides essential context for effectively managing the pavement network. Functional classification defines how each roadway serves mobility and access: arterial streets typically carry larger volumes of traffic over longer distances, while local streets provide access to neighborhoods and properties. Roadway functional classification is also a factor in eligibility for grant funding. Federal resources are typically only available for arterials.

The City of Redmond′s Street network is nearly evenly split between arterials (47.9%) and residential (52.1%) streets. The arterial network is critical infrastructure providing primary access to commercial and industrial centers and throughfares for commuters in eastern King County. The City's Street network classifications are shown on the map in Figure 3

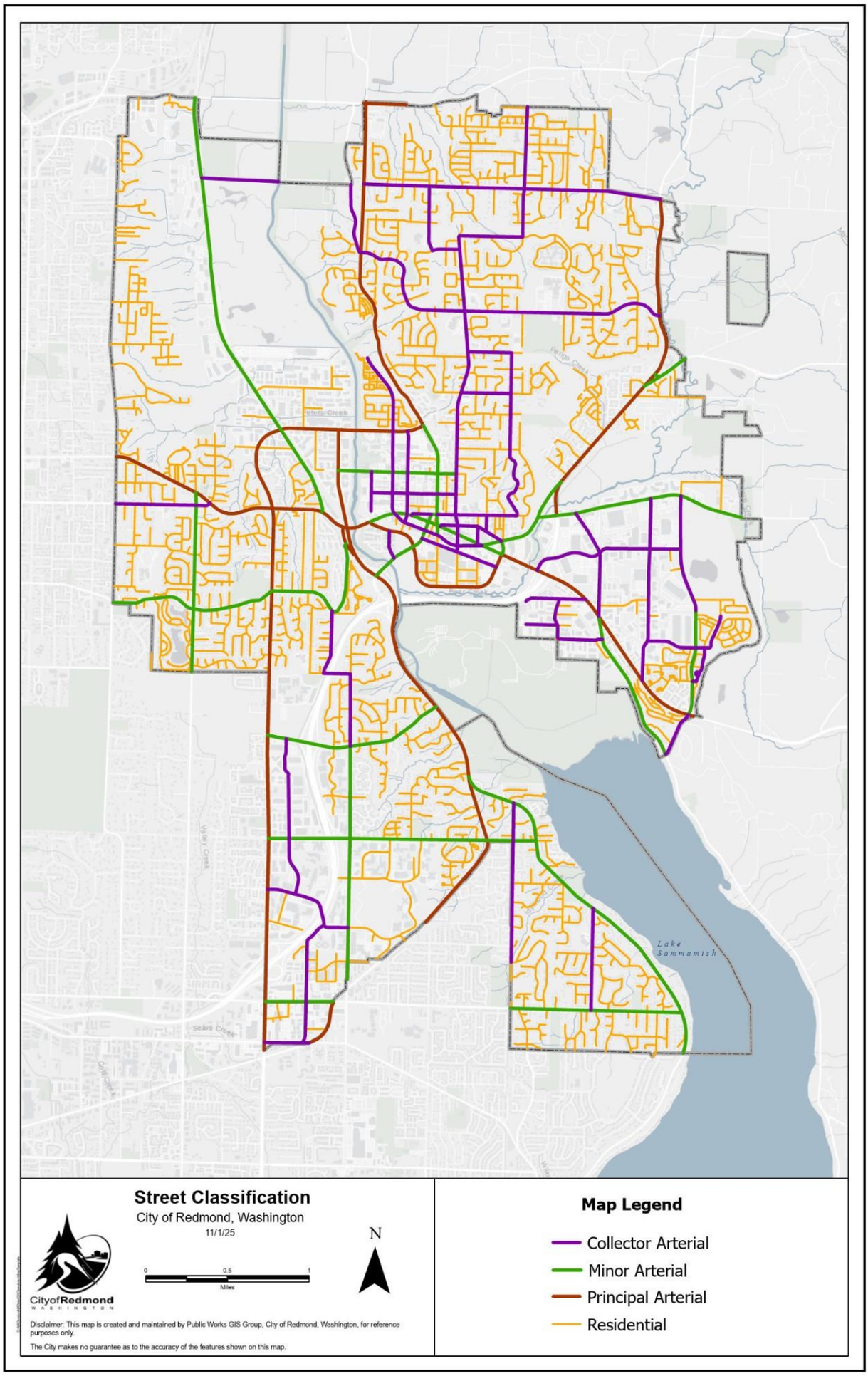


FIGURE 3. STREET NETWORK CLASSIFICATIONS.

Redmond's street network consists of **362 lane-miles** across a variety of functional classes:

TABLE 4: LANE-MILES BY FUNCTIONAL CLASSIFICATION

Functional Classification	Lane-Miles	Remaining Life (Years)	PCI (Year 2025)
Principal Arterial	50.0	12.4	59
Minor Arterial	60.8	15.9	67
Collector Arterial	62.3	16.5	67
Residential/Local Streets	188.5	25.5	71
TOTAL	361.6		68

This breakdown reflects a balanced network that serves both regional travel and local access needs.

Given Redmond's total land area of approximately 17.3 square miles, the city maintains over 20.9 lane-miles per square mile, indicative of a highly developed urban street system. The density and distribution of roadways directly affect the City's pavement management strategy: arterial streets require more frequent and higher-cost treatments, while residential streets, though lower-cost per mile, represent the network and require consistent preventive maintenance to remain serviceable.

2.2 Current Pavement Condition Assessment for 2025

The City's most recent pavement condition assessment provided the number of lane-miles within each functional classification and pavement structure type. Table 4 presents the lane-miles of asphalt streets in each functional classification, distributed by PCI condition, and the following sections summarize the conditions for each roadway classification type.

TABLE 5. LANE-MILES OF ASPHALT STREETS BY FUNCTIONAL CLASS, BY PCI.

	Current PCI Range						
Functional Classification	**0-25 (Failed/ Serious)**	**26-40 (Very Poor)**	**41-55 (Poor)**	**56-70 (Fair)**	**71-85 (Satisfactor y)**	**86-100 (Good)**	**Total Lane-Miles**
Principal Arterial	2.8	5.3	11.0	19.9	5.0	5.9	49.9
Minor Arterial	0.1	2.3	8.9	21.4	22.3	3.2	58.2
Collector Arterial	0.0	0.9	12.8	27.3	13.4	6.2	60.6
Residential/Local Streets	0.8	4.5	18.1	44.5	109.0	9.9	186.8
Total Lane-Miles	3.7	13.0	50.8	113.1	149.7	25.2	355.5*

*Total is for asphalt streets only and excludes concrete, asphalt/concrete, and gravel streets

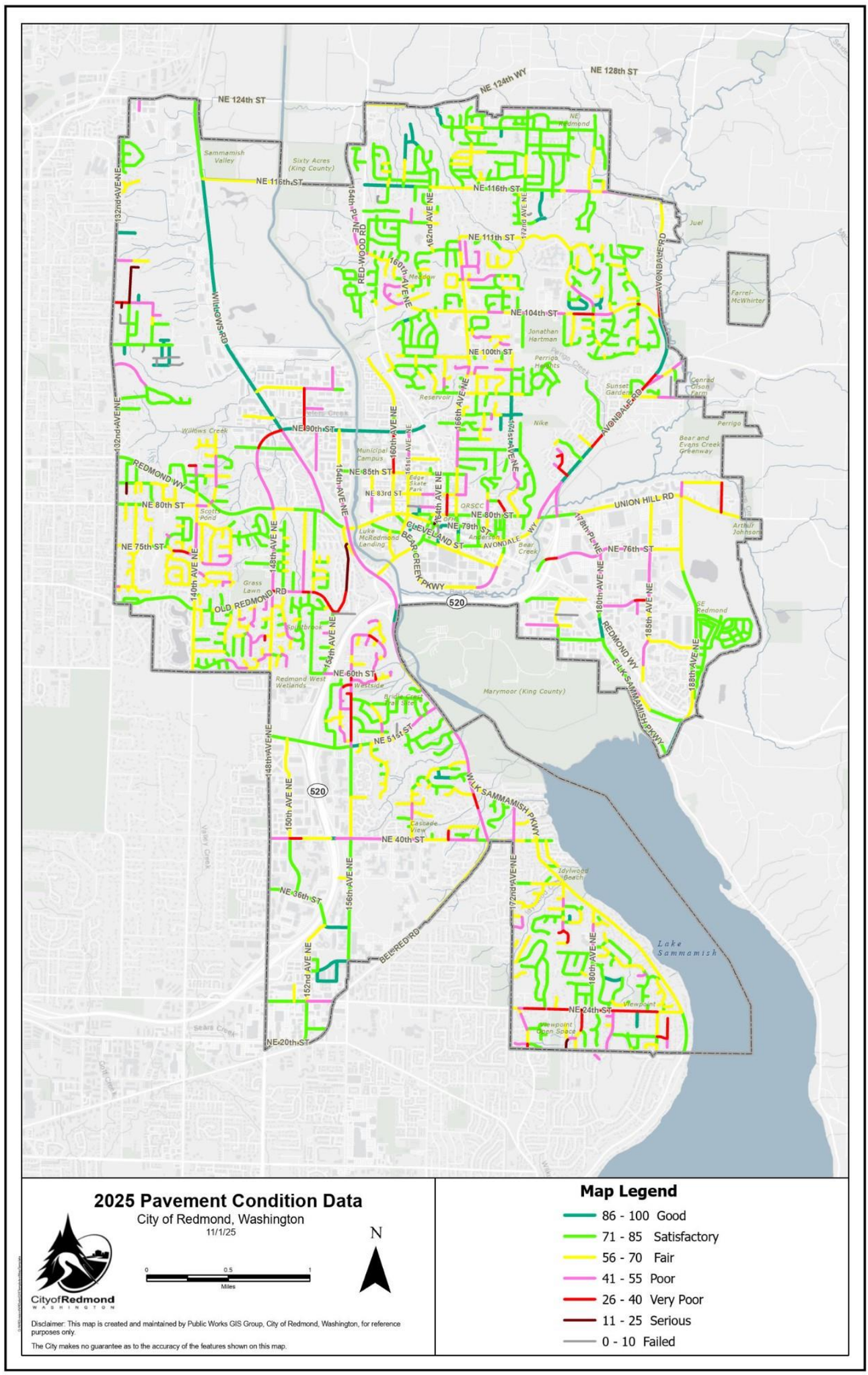


FIGURE 4. STREET NETWORK CONDITION RESULTS FOR 2025

Principal Arterials

Principal Arterials are high-capacity roadways critical for multi-modal uses, serving freight vehicles, buses, bicycles, and general vehicle traffic. Keeping them in good repair is essential to moving goods and people. The City's Principal Arterials (identified on Figure 3) are:

Since 2021, the proportion of the City's Principal Arterials in *Poor* or worse condition (PCI < 55) has continued to decline, growing from 30% to 38%.

- Avondale Road(10.4 lane-miles)
- Bear Creek Parkway(3.0 lane-miles)
- Bel-Red Way (4.5 lane-miles)
- Redmond Way(6.8 lane-miles)
- West Lake Sammamish Parkway(7.2 lane-miles)
- 148th Avenue NE(10.6 lane-miles)
- 154th Avenue NE(2.9 lane-miles)
- 170th Avenue NE(1.4 lane-miles)
- NE 124th Street (0.5 lane-mile)
- NE 90th Street (2.7 lane-miles)

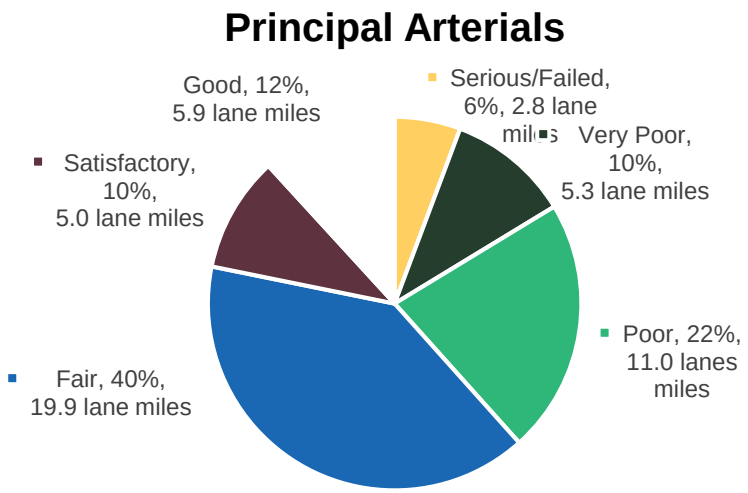


FIGURE 5. PROPORTION OF CURRENT LANE-MILES BY PAVEMENT CONDITION FOR PRINCIPAL ARTERIALS (PCI RANGE CONDITION, %, LANE-MILES).

Minor and Collector Arterials

Minor Arterials serve as the primary connection between neighborhood streets and Principal Arterials, often featuring multiple through lanes. Collector Arterials funnel traffic from Residential and Local Streets onto these larger roadways.

Since 2021, the proportion of the City's Minor and Collector Arterials in *Poor* or worse condition (PCI < 55) continued to decline, growing from 12% to 21%.

If the City's funding plan stays the same as it is today, the proportion of Minor and Collector Arterials in *Poor* or worse condition will increase to 38% by 2037.

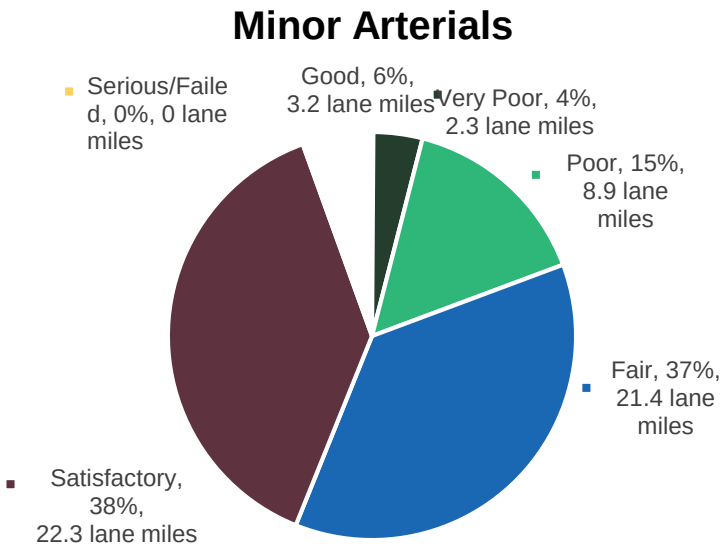


FIGURE 6. PROPORTION OF LANE-MILES BY PAVEMENT CONDITION FOR MINOR ARTERIALS (PCI CONDITION RANGE, %).

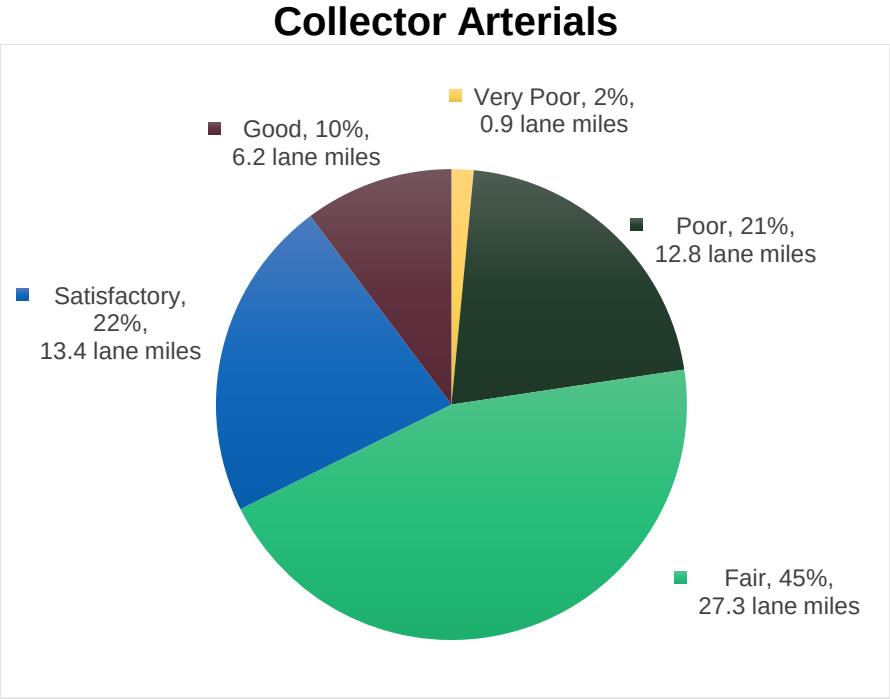


FIGURE 7. PROPORTION OF LANE-MILES BY PAVEMENT CONDITION FOR COLLECTOR ARTERIALS (PCI CONDITION RANGE, %).

Residential and Local Streets

Residential and Local Streets are prime candidates for preventive maintenance treatments, which are less costly than rehabilitation treatments. These streets have lower traffic volumes and lower-weight vehicles than the arterial system, resulting in less load-related distress. Traditional preventive maintenance treatments, including crack sealing, slurry seals, and chip seals (See Appendix D for definitions of treatments), extend the life of streets by protecting the pavement surface from moisture infiltration, oxidation, and embrittlement. **These preventative maintenance treatments are four to six times less expensive than rehabilitation treatments** and have a shorter duration of impact on users. Consistent preventive maintenance treatments are key to maintaining the City's street network in a stable condition and optimizing the City's budget.

The number of Residential and Local Street lane-miles rated in *Satisfactory* condition or better (PCI >71) is low, at only 58%.

If the City's funding plan stays the same as it is today, the number of Residential and Local Streets in *Satisfactory* or better condition continue to decline and will drop to only 26% by 2037.

The decline in the condition of residential and local streets is not merely a technical issue; it is increasingly visible to residents in their daily lives. With over 52% of the City's Street network falling into this classification, deteriorating pavement conditions are affecting neighborhoods across Redmond. Residents may perceive this decline as a sign of neglect or underinvestment,

leading to frustration, reduced confidence in City services, and growing concern about safety, comfort, and long-term infrastructure stewardship. The condition of local streets is often the most tangible reflection of the City's performance for the public, and as such, their deterioration carries a disproportionate impact on community satisfaction.

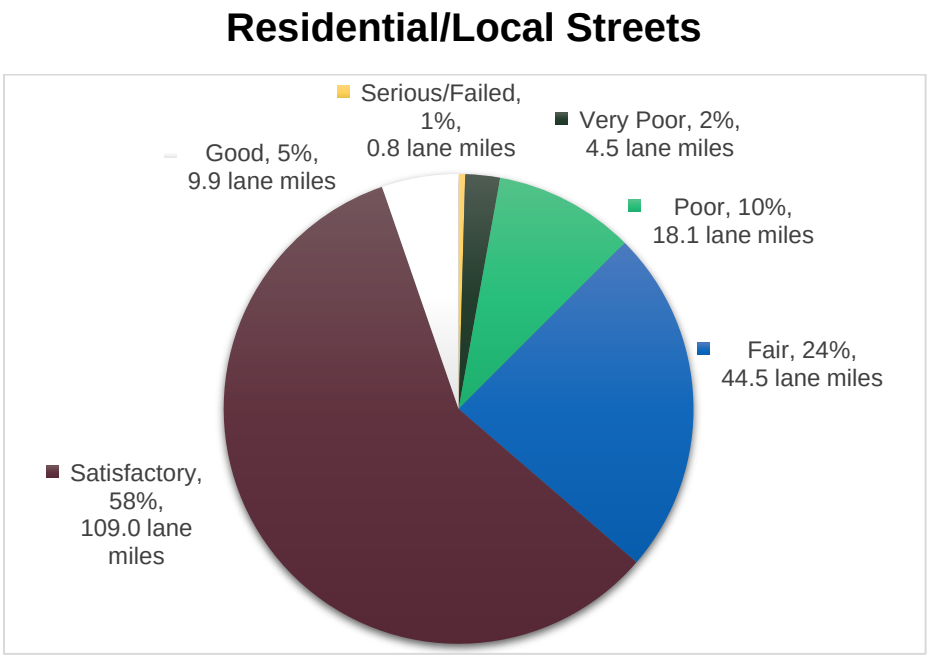


FIGURE 8. PROPORTION OF LANE-MILES BY PAVEMENT CONDITION FOR RESIDENTIAL/LOCAL STREETS (PCI CONDITION RANGE, %).

2.3 Pavement Condition Trends

For the last two decades, the condition of the City's pavement network has been in a steady decline, a trend that has accelerated significantly over the last six years. This is driven by aging infrastructure and inconsistent funding that hasn't kept up with inflation and rising construction costs in the Puget Sound Region. Due to stagnant budgeting and funding levels that fail to keep pace with rising maintenance costs, the City's street network has been gradually deteriorating. This slow decline has reached a tipping point, leading to an exponential deterioration in overall street conditions. As a result, the City of Redmond has a significant gap between current funding levels and the budget needed to reverse the pavement condition trend, stop the decline, and move in a positive direction.

The budget challenges, combined with the growing heavy vehicle traffic and aging pavement, have compounded the need for higher funding levels in the future to move the City's street network into an acceptable condition. Figure 9 shows the history of Redmond's declining condition of the street network and the levels of historic funding by biennium.

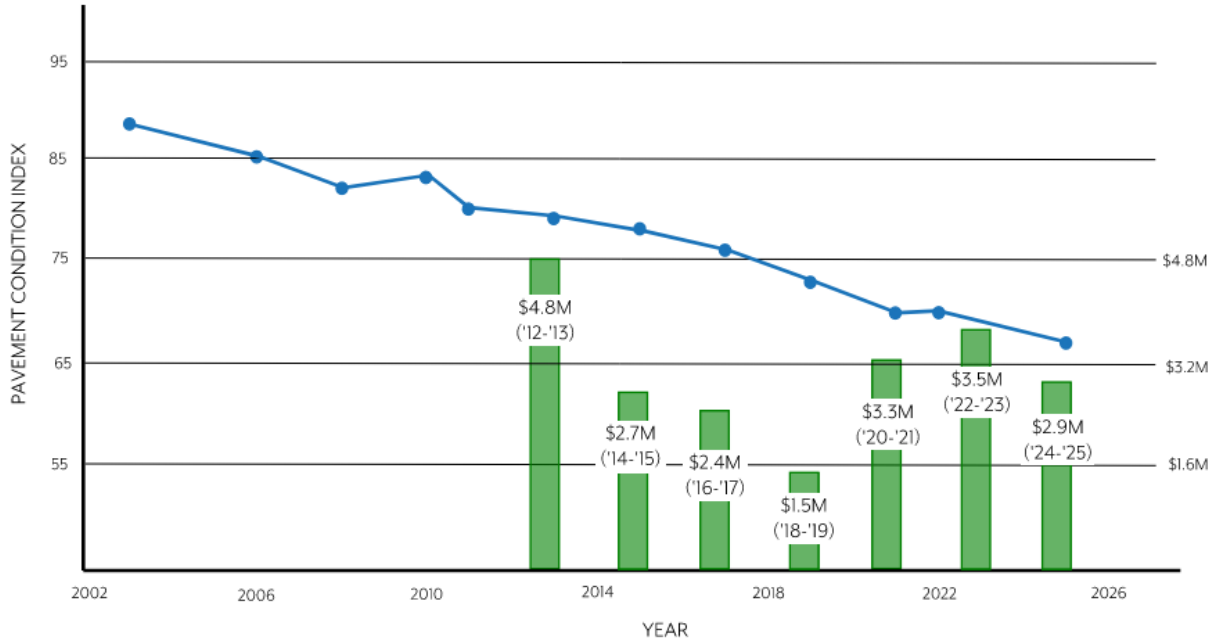


FIGURE 9. REDMOND'S ANNUAL PCI CONDITION AND BUDGET HISTORY.

The Pavement Degradation Curve: Why Timely Maintenance Matters

Understanding how pavement ages is essential for effective asset management. This section explains the typical lifecycle of pavement, why deterioration accelerates over time, and how traffic loading and design choices influence service life.

Pavement is known to have a distinct degradation curve; this is true for individual pavement segments, groups of pavement types, and pavement networks. Pavement conditions stay stable for the first third of the pavement's life, declining slowly. As the asphalt pavement surface ages, the asphalt cement near the surface becomes oxidized, brittle, and less resistant to cracks. Once cracks develop, moisture infiltrates the pavement, accelerating deterioration.

The pavement degradation curve shown in Figure 10 illustrates pavement degradation rates over time. The graph has age on the x-axis, which in this case is synonymous with Service Life. For an entire pavement network, the goal of the pavement management program is to extend the service life of the original pavement and keep the network in the *Satisfactory* condition. Pavement conditions can be kept in satisfactory condition through annual preventive maintenance and timely rehabilitation projects. As pavements start to slip out of Satisfactory condition, the rate of decline in pavement condition accelerates much faster than it did in the first third of the original pavement life.

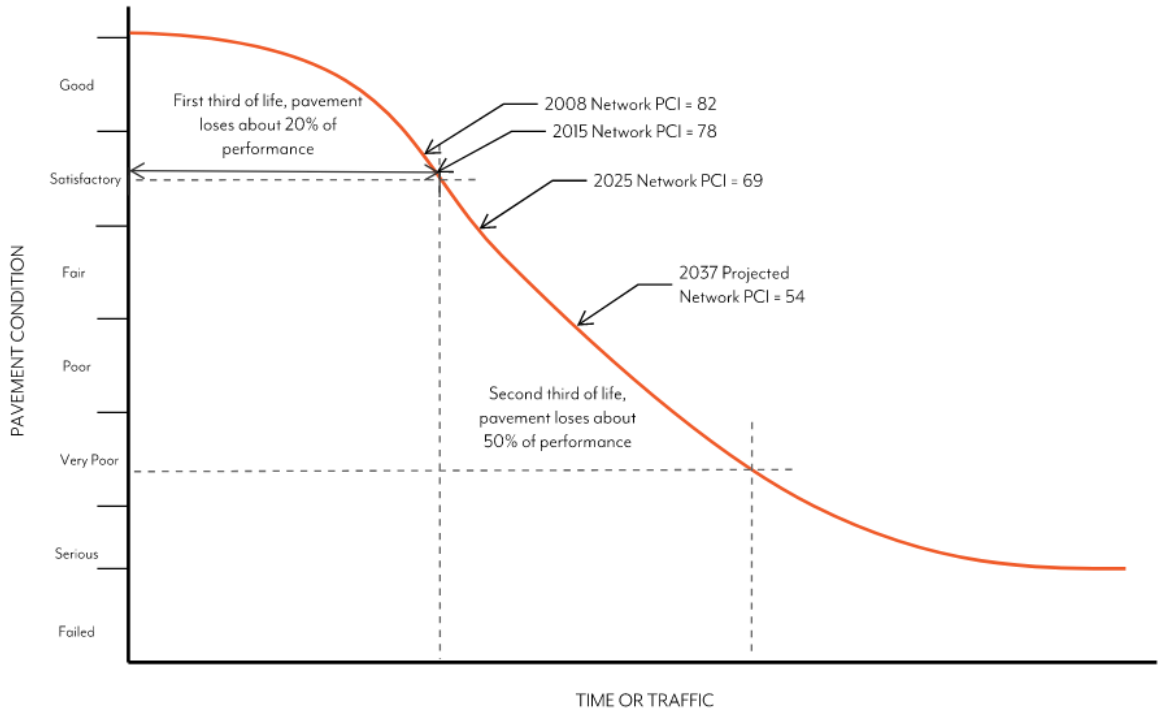


FIGURE 10. TYPICAL PAVEMENT DEGRADATION CURVE.

Figure 10 presents historical PCI network data for the City of Redmond. The network PCI in 2008 was 82 and declined to 69 in 2025. Pavements with a PCI of 55 are four to six times more expensive to rehabilitate than those with a PCI of 75.

The City of Redmond is currently in the stage of rapid decline of the street networks' pavement condition. This is due to over a decade of funding that did not keep pace with the need to maintain the City's once *Satisfactory* network condition. In 2015, the City proposed a levy to fund the pavement management program. The Levy did not pass, and as a result, the condition of the street network started to decline more rapidly. The impact of the failed levy to fund pavement preservation projects in 2015 can be seen in Figure 10. From 2008 to 2015, the network PCI declined by 4 points. After the funding levy failed, the network PCI declined another 9 points to 69 in 2025.

Redmond's Pavement Condition Trends

Since 2003, the City's pavement condition has declined significantly. In 2003, the network PCI was at 88 (*Good* condition). Today it is at 68 (*Fair* condition). As shown in the typical pavement degradation curve in Figure 10, this *Fair* condition corresponds to the end of the optimal service life and the inflection point of the curve, where the condition begins to decline rapidly.

The City is experiencing growth in several areas of development, including residential, industrial, and transit use. The street network is supporting more vehicles and heavier vehicles. More goods are being distributed directly to consumers, leading to increased delivery truck traffic on residential streets. The number of delivery trucks compounds at the collector and arterial level. **Heavy vehicles, including trucks and buses, contribute to the most significant impact on the wear and failure of pavements.**

Figure 11 shows the continual decline over the past five years and an unacceptable decline in the condition of the City's arterial streets. While residential streets have been declining, they have still maintained an acceptable condition (although this trend is expected to slip into an unacceptable condition). The increase in the condition of the four functional classification categories between 2024 and 2025 is attributed to the pavement inspection completed in 2025. Inspection years offer an opportunity to recalibrate the pavement degradation curve and the network's current state. Inspections also capture and reconcile developer-funded improvements that may not have been accounted for in the StreetSaver model. The City conducts pavement condition inspections biannually for the whole street network.

The decline in street condition is most severe in the City's Principal Arterials; once at the low end of *Fair* condition, these critical roadways are now deteriorating into the high end of the *Poor* condition range. Principal Arterials make up over 14% of the City's street network, and carry the highest volumes of traffic.

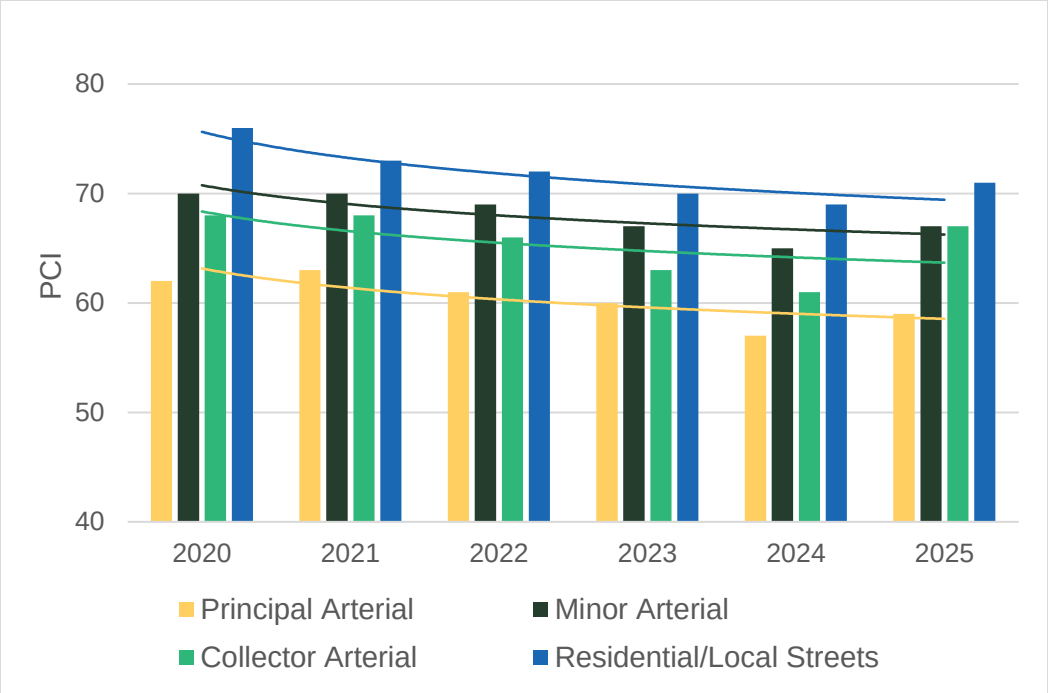


FIGURE 11. HISTORICAL TREND OF PCI BY FUNCTIONAL CLASSIFICATION.

2.4 Pavement Management Costs

Average Pavement Management Costs

The cost of performing pavement management activities on arterial streets is significantly higher than on residential neighborhood streets. This is due in part to the fact that some maintenance treatments appropriate for low-volume local roads—such as chip seals and slurry seals—are *not* suitable for high-volume arterials. Arterial streets carry heavier traffic loads and require more durable, higher-cost treatments to achieve adequate performance and longevity.

As a result, by the time arterial streets are ready for maintenance, they often require more intensive and expensive rehabilitation methods rather than the lower-cost surface treatments used in neighborhoods. In the worst-case scenario, when pavement has fully failed, arterial streets may require full-depth reconstruction, which is substantially more costly and disruptive due to traffic volumes.

The table below summarizes the average cost per lane-mile for various pavement management activities.

TABLE 6. PAVEMENT MANAGEMENT TREATMENT TYPES AND COSTS

Pavement Management Activity	Example of Treatment	Cost per Lane Mile
Maintenance	Crack seal	$4,000/lane mile
Maintenance	Chip seal, slurry seal	$50,000/lane mile
Rehabilitation	Pavement grind and overlay	$300,000/lane mile
Rehabilitation with some full depth repair	Pavement grind and overlay, with some full depth repairs	$450,000/lane mile
Reconstruction	Full depth removal of pavement and replacement	$2 million/lane mile

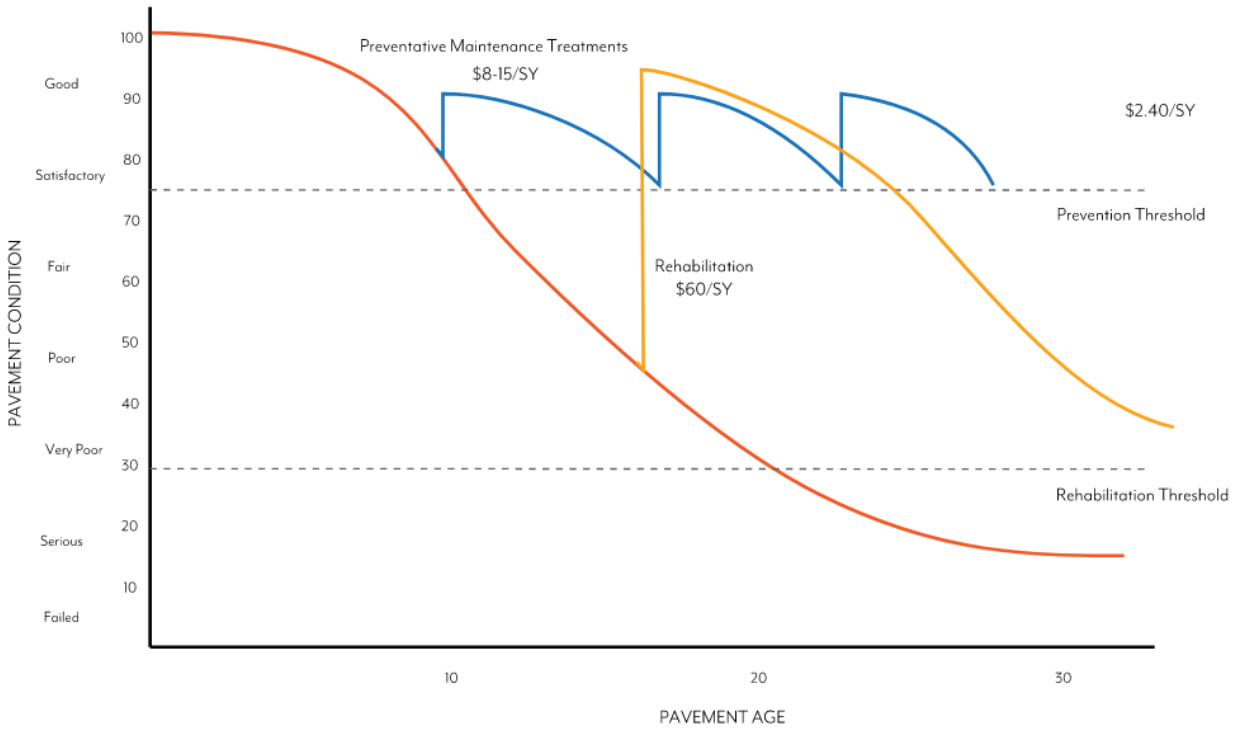


FIGURE 12 PAVEMENT DEGRADATION CURVE AND MAINTENANCE STRATEGIES

Preventive maintenance treatments are critical components of keeping parts of a street network that are already in satisfactory condition, in that condition for a longer period of time. Often, a disproportionate amount of money is allocated to rehabilitation.

Because of the higher cost of rehabilitating arterials and the City's relatively small annual budget for pavement preservation maintenance, the City has not been able to implement a pavement preservation project on arterial streets every year, while the limited budget has allowed for small maintenance projects on residential and collector streets. Typically, pavement preservation projects on arterial streets in Redmond have been funded through grants, which are not guaranteed annual revenue sources.

Network Replacement Costs

The **network replacement unit cost** is a planning-level metric used to estimate the total cost required to fully reconstruct the entire pavement network from the ground up. It represents the average cost per unit (typically per lane-mile or square yard) to fully remove and replace the existing pavement structure, including subgrade preparation, base materials, asphalt paving, and associated roadway features.

For most municipalities, this value is calculated based on recent bid data, typical pavement section designs, and observed construction costs. In the Puget Sound Region of Washington state, full-depth street reconstruction typically ranges between **$1.1 million and $1.7 million per lane-mile**, depending on roadway classification, urban context, and scope (e.g., curb ramps, drainage, utility coordination).

For the City of Redmond, the replacement value of Redmond′s 362 lane-mile network is $450 million, based on estimated unit costs specific to the City.

> *Using $1.1 million for 189 lane miles of residential/local streets = Replacement value of $208 million*
> *Using $1.4 million for 173 lane miles of arterial streets = Replacement value of $242 million*

This figure highlights the significant capital investment represented by the City's street infrastructure and underscores the importance of preventive maintenance and timely rehabilitation to extend pavement life and avoid costly full-depth reconstruction. By preserving pavements in *fair*-to-*good* condition, the City can defer full replacement and manage its assets in a fiscally responsible and sustainable manner.

3.0 Goals

The fundamental goal of Redmond's pavement management program is to maximize the effectiveness and efficiency of street network maintenance, ensuring safe, reliable, and high-quality transportation for all users.

Between 2021 and 2025, Principal Arterials, which are critical for regional mobility, have dropped into the *Fair* condition range:

- **The number lanes miles of Principal Arterials in *Satisfactory* and *Good* condition have dropped by almost 10%**
- **The lane miles of Principal Arterials in *Poor* or worse condition have increased by 10%**
- **The cost impact of deferring treatments is more than $2 million dollars.**

Redmond's overall **street network is at risk of slipping into *Poor* condition within the next seven years** if current insufficient funding levels and sporadic funding patterns continue.

3.1 Data and Preferred Level of Service Goals

City's Target Condition (PCI)

The Transportation Master Plan (TMP) establishes a network-wide pavement condition target of PCI 70, which represents the threshold between good and deteriorating pavement and serves as the basis for the City's long-term investment estimates. This Pavement Strategic Plan refines that target, setting a minimum condition of PCI 71 — placing the network in the Satisfactory category, where pavements are structurally sound, smooth, safe, and comfortable for all users — with an optimal long-term goal of PCI 75. The one-point adjustment above the TMP threshold is intentional: a target set exactly at the boundary between condition categories leaves no buffer against normal year-to-year variation in network scores. A minimum of PCI 71 preserves full alignment with the TMP's policy intent while providing a modest margin that supports proactive, preventative maintenance rather than costly rehabilitation or reconstruction.

The optimal target of PCI 75 reflects the mid-range of the Satisfactory category, where the most cost-effective treatments can be applied, long-term lifecycle costs are minimized, and resilience against unanticipated budget shortfalls is greatest.

Redmond's Minimum Target

PCI = 71 = Satisfactory Condition

A PCI of 71 is widely recognized as the optimal threshold for balancing performance, cost-efficiency, and user experience, making it the best strategy for sustaining a high-quality street network.

The *Satisfactory* condition level significantly enhances the experience for drivers, cyclists, transit riders, and pedestrians by reducing potholes, minimizing surface irregularities, and improving overall ride quality. Reaching a target of PCI 71 would eventually allow the City to implement the most cost-effective treatments, such as preventive maintenance, rather than expensive rehabilitation or reconstruction. This goal also improves the resiliency of the pavement network, helps protect against unanticipated budget shortfalls, reduces long-term lifecycle costs, and minimizes disruption from frequent repairs.

Other Performance Metrics

As the pavement management program becomes more established and after a new budget scenario is established, the City will work towards identifying other performance metrics that inform decision making and the measure progress of pavement management programs. These may include target metrics such as maintenance backlog, cost per lane mile, percentage of roads in Satisfactory condition, and community satisfaction.

What are other cities doing?

A common target PCI of the overall street network for other cities within Washington state is 70 and above. The PCI rating of 70 is the top rating of the *Fair* category, so striving for a rating above 70 moves the network pavement condition up into the next category of *Satisfactory* and gives agencies more flexibility of the decision making for annual maintenance and repairs. The table below shows some of the PCI data for other cities in Western Washington.

TABLE 7.OTHER LOCAL AGENCY PCI'S

Agency	Lane Miles	Current Network PCI (Year)	Target PCI	Annual Budget
Bellevue	1116 (lane miles)	74 (2025)	78	$6M
Bothell	134 (centerline miles)	64 (2023)	75-80 Arterials 70-75 Local Streets	$2.6M
Kirkland	259 (centerline miles)	72 (2025)	70	$4.2M
Lynnwood	300 (lane miles)	74 (2023)	72	$3M
Shoreline	338 (lane miles)	71 (Arterials, 2025) 79 (Local Streets, 2025)	No goal	Varies $1.16M - $1.3M plus grant funds averaging $2M/yr

3.2 Community Satisfaction Goals

Over 52% of Redmond's street network consists of Residential and Local Streets. These are the roads residents interact with most frequently, and their condition plays a central role in shaping public perception. As pavement quality declines, residents may experience increased noise, reduced comfort, and safety concerns, particularly for pedestrians, cyclists, and those with mobility challenges. Poor pavement conditions can also lead to vehicle damage, increased maintenance costs, and reduced property values, all of which contribute to frustration and erode trust in City services.

Beyond safety and mobility, pavement conditions also affect environmental performance. Studies have shown that smoother pavements reduce rolling resistance, thereby lowering fuel consumption and greenhouse gas emissions. Surface smoothness has been identified as one of the most effective strategies for reducing transportation-related emissions—more impactful than several other commonly adopted practices in the transportation sector.

Community satisfaction goals for pavement management should include:

- **Maintaining a high-quality driving surface** on both arterial and residential streets to reduce noise, improve comfort, and enhance safety.

- **Minimizing unplanned disruptions** through proactive maintenance and long-term planning.
- **Ensuring equitable investment** across neighborhoods to avoid disparities in pavement conditions.
- **Supporting environmental sustainability** by preserving pavement smoothness and reducing lifecycle emissions.
- **Improving transparency and responsiveness** through public engagement, clear communication of priorities, and visible results.

By aligning pavement management strategies with these goals, Redmond can build public trust, demonstrate fiscal responsibility, and deliver a transportation system that reflects its community's values and expectations.

3.3 Measurable Goals

The measurable goals include:

- **Establish an annual budget** that starts with a new, increased base budget in 2027 and increases bi-annually by a predetermined amount.
- **Condition/PCI goals:** Reach a level of *Satisfactory* condition with a street network PCI of 71 by year 2039 and continue improving conditions in the *Satisfactory* condition over time, ultimately reaching a street network PCI of 75, with the ability to maintain a PCI of 75. Budget scenarios should be reevaluated in 2039 to assess progress towards the long-term PCI 75 goal.
- **Performance metrics:** By year 2029, identify other key metrics that will be used by the paving program to measure progress, such as maintenance backlog, cost per lane mile, percentage of roads in Satisfactory condition, and community satisfaction.

4.0 Funding

4.1 Existing Investment Levels and Sources

Over the past six years (2020–2025), the City of Redmond has received an average of **$1.7 million per year** in pavement funding from three sources:

- **City's Capital Improvement Program (CIP):**
  The largest and most stable funding source, contributing approximately $775,000 annually. CIP funds are often used as local match for grant applications, enabling the City to leverage external funding for major paving initiatives.
- **Transportation Benefit District (TBD):**
  Established in 2023, the TBD has provided an average of $500,000 annually for the programmatic pavement program starting in 2023, in addition to TBD funds that are allocated for paving on larger corridors like NE 24th Street and Avondale through the Capital Improvement Program. The creation of the TBD marked a significant step in increasing funding for pavement management, allowing the City to expand the scope of annual paving projects.

  Between 2023 and 2025, the $1.5 million provided by the TBD was used for preventative maintenance treatments for residential streets, improving the PCI of residential streets from 70 in 2023 to 71 in 2025. While the residential street network condition improved between 2023 and 2025, the overall city network remained the same at 67, further demonstrating the need for increased funding for the program.
- **Developer/Utility Mitigation Projects:**
  The City's development code requires utilities and private developers to implement pavement improvements commensurate with their project impacts. While developers do not contribute the funding for the improvements directly to the City's annual budget, these mitigation efforts have generated approximately $350,000 in value in pavement enhancements annually. Although this amount varies slightly annually, this source of funding is considered in the City's annual budget, as projects do occur on an annual basis.

TABLE 7 HISTORICAL ANNUAL FUNDING.

Programmatic Funding ($)			Capital Improvement Program (CIP) ($)			
Year	**Programmatic Funding - Budget**	**Programmatic Funding* - Actual Cost**	**CIP - Budget**	**CIP - Grant Funding Match**	**CIP – Total Budget**	**CIP – Actual Cost**
2020	200,000	359,500	-0-	-0-	-0-	-0-
2021	200,000	299,300	-0-	-0-	-0-	-0-
2022	200,000	392,100	1,984,000	410,000	2,394,000	2,331,400
2023	500,000	445,200	752,300	1,426,000	2,178,300	1,628,500
2024	500,000	655,000	-0-	-0-	-0-	-0-
2025	500,000	657,300	1,502,300	1,436,000	2,938,300	1,426,600
Total	*2,100,000*	*2,808,400*	*4,238,600*	*3,272,000*	*7,210,600*	*5,386,500*

*Actual cost includes construction costs, staff and soft costs, and consultant costs.

Grant Funding

The City successfully secured grant funding in 2022, 2023, and 2025 for select projects, averaging $1,090,700 per year. However, grant funding is typically only available for rehabilitation activities and not for improving streets that are near failing condition. In addition, grant awards are competitive and **not guaranteed, so they are not included in** the program′s annual base budget. CIP funds are typically leveraged as matching funds for these grants.

4.2 Budget Scenarios

Projected Pavement Condition with Current Funding Levels

Current funding levels are insufficient to address the backlog of repairs needed and achieve long-term Level of Service goals. The City's average annual investment of $1.7 Million/year has slowed—but not reversed—the rate of pavement deterioration. Without additional, sustained funding, the network is projected to continue degrading at a rate of over one PCI point per year.

Twelve-year projections of the network PCI were modeled in StreetSaver, the City's pavement management database. Based on the current PCIs for each street segment, StreetSaver projected a "No Funding" scenario, as shown in Figure 13. This shows that without any preservation, maintenance, or rehabilitation, the City's pavement network would deteriorate to a PCI of 44 (*Poor* condition) by the year 2037. The deterioration rate increases from the historical average of just over one index point of decline to more than two index points of decline of the PCI annually.

The other two projections are based on the current annual average expenditure of $1.7 million and a scenario in which the annual budget is increased to $2.62 million. An increase in $1 million annual budget does very little to impact the improvement towards achieving the City's minimum goal of a network PCI of 71 (*Satisfactory* condition).

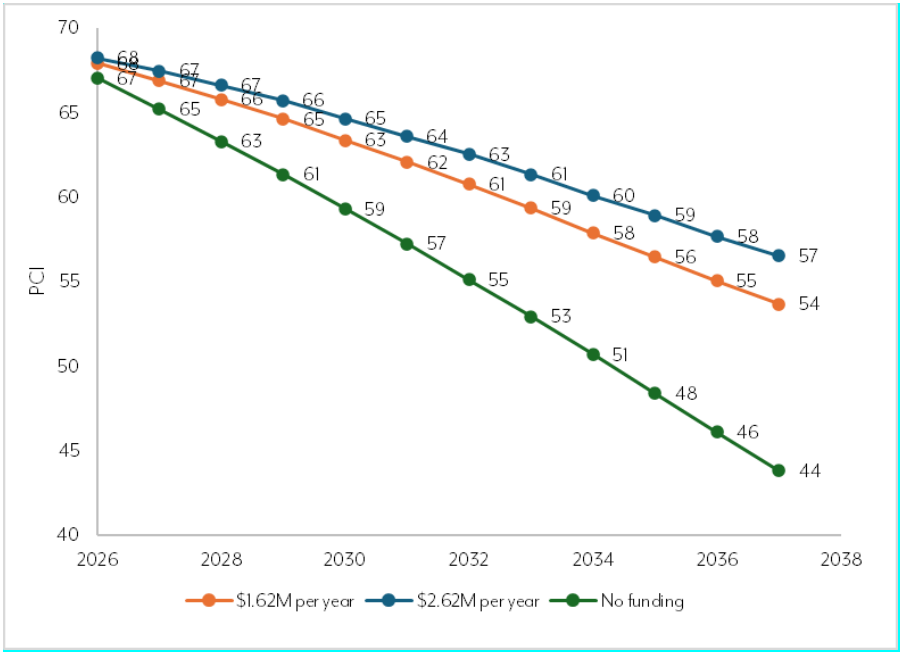


FIGURE 13. PROJECTION OF PCI AT CURRENT INVESTMENT LEVELS.

What would it look like to get the City's streets into *Satisfactory* condition?

The City's historical data provides a clear picture of condition trends and funding trends, and can smartly be used to inform pavement management needs.

The network target PCI is 71 within the *Satisfactory* range with a longer-term goal of 75.

Reversing the pavement deterioration trend will require a significant increase in the City's pavement management budget and an intentional management of how annual funding is split between arterials and residential streets.

> Achieving a PCI of 71 by year 2039 would require a base budget of $4M, increasing $1M annually.

With this element used as the basis for achieving results, Figure 14 below shows example City budget scenarios for achieving the PCI milestone targets 71 and 75 by 2039.

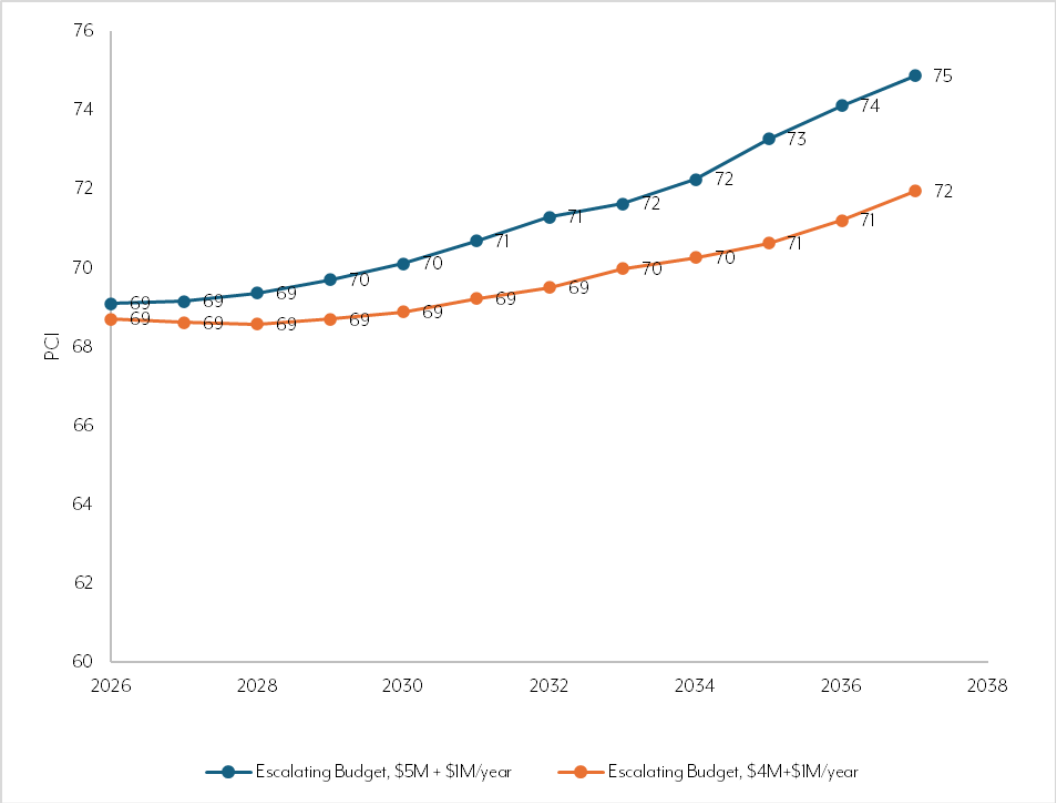


FIGURE 14. PATHS TO PCIS OF 71 AND 75.

Table 8 shows the results of various budget scenarios for consideration.

TABLE 8. ANNUAL BUDGET SCENARIOS

Budget Scenario	Duration (Years)	Annual Proposed Budget	Network PCI (at end of duration)	Arterial PCI (at end of duration)	Residential PCI (at end of duration)	Total Spend (at end of duration)
2025 Baseline PCI	0	N/A	68(2025)	64 (2025)	71(2025)	N/A
Do Nothing(no spend)	12	$0	44	38	52	$0
Maintain Existing Budget	12	$1.7M annually	54	55	54	$18.9M
Existing Budget + $1M	12	$2.7M annually	57	58	56	$30.6M
Achieve City's Target of Minimum Network PCI 71	12	$4M+$1M *Progressive funding**	71	76	70	$114M
Achieve a Target Network PCI of 69	12	$5M+$500k *Progressive funding**	69	71	65	$92.3M
Recommended Budget	**12**	**$5M+$250k *Progressive funding****	**68**	**68**	**67**	**$76.5M**
Achieve Optimum Target PCI 75	**12**	**$8M+$250k *Progressive funding****	**75**	**76**	**73**	**$111M**

*Progressive funding scenarios establish a base budget in year 2027 and then incrementally increase each year by the amount shown.

4.3 Funding Recommendations

For a pavement program to be successful, it is important to recognize that funding recommendations are not just about a budget, but also include a plan for how the budget is managed and allocated.

The recommendations for the City's pavement management program to be successful include the following budget and program recommendations:

- **Establish one dedicated programmatic budget:** Establish a paving program budget that is dedicated to annual paving and preventative maintenance projects. The goal is to eliminate the need for annual paving projects to compete with the budgets needed for other CIP projects.
- **CIP Projects:** Classify paving projects that include significant safety improvements and/or multimodal changes as CIP projects instead of programmatic paving projects.
- **Transportation Benefit District (TBD) Funding:** Increase the contribution from the City's TBD to fully fund the paving program annual budget.
- **Progressive Annual Budget:** Implement a "progressive budget" funding strategy so that the funding keeps up with inflation and other potential rising costs. The progressive annual budget includes approval of a base annual budget amount, as well as an incremental amount that is progressively added to the budget each year.
- **Grant Funding:** Leverage potential grant funding and continue to pursue state and federal grants, using the paving program budget as the match money.
- **Coordination with Utility Projects:** The City can maximize efficiency by aligning pavement work with utility upgrades, sharing costs, and minimizing disruption.
- **Future establishment of a City paving crew:** The City's paving crew would be responsible for repairing potholes, crack sealing, rehabilitating small, isolated areas of arterial streets, and performing mill and overlay projects for residential streets. These activities on arterials and collectors will help improve the network's PCI and contribute to more competitive grant scoring. The paving crew would also provide flexibility by being more reactive if needed by making permanent fixes, which is more cost-effective for the smaller needs and helps prevent degradation over time. A paving crew like the concrete crew can achieve early wins through targeted pavement repairs in neighborhoods and select repairs on arterials. When combined with the recommended funding request and grant funding, a future establishment of a paving crew would position the City to achieve the target PCI of 71.

Proposed Budget Recommendation

One of the most important goals of this Strategic Plan and the proposed budget recommendation is to halt the rapid deterioration of the City's street network. There is much to consider when establishing a budget that is a significant increase from the current funding scenario. To arrive at a budget that makes sense specifically for the City, many factors were considered, including the condition of the existing street network, how the budget should be allocated annually between arterials and residential streets, pavement treatments that make sense for the City and the residents, establishing target PCIs that are achievable, and how to get the most impact from the dollars allocated.

Based on these considerations and the results of the funding scenarios in Table 8, the City should consider moving forward by funding the programmatic paving program with a progressive funding budget, which would begin in year 2027 with an annual budget of $5million and a $250,000 increase annually through year 2039 (identified as "Proposed Budget" in Table 8).

The $5M+$250K progressive funding scenario will:

- Maintain an acceptable street network PCI of 68 (*Fair*)
- Maintain an acceptable arterial network PCI of 68 (*Fair*)
- Maintain an acceptable residential network PCI of 67 (*Fair*)
- Split the allocation of the budget approximately 70% to arterials and 30% to residential streets

While this budget scenario alone does not meet the minimum PCI target of 71 by 2039, it provides a practical, incremental funding structure and creates the opportunity to achieve the City's PCI goals through the combined use of grant funding and a future establishment of a City paving crew. Grant funds are typically available for paving projects on arterial streets, and can be pursued to bring the arterial network above this scenario's projected result of PCI 68 and toward the minimum target of PCI 71. On the residential side, grant funding opportunities are rare; however, residential streets are projected to remain within an acceptable condition range under this budget scenario, and the paving crew can be deployed to close the remaining gap and bring residential streets to the minimum target of PCI 71.

5.0 Pavement Management Implementation Plan

The recommendations and goals established in this Pavement Strategic Plan are carried forward in the companion Pavement Management Implementation Plan. While this Strategic Plan defines the City's pavement condition targets, funding scenarios, and general resource needs, the Implementation Plan provides the operational detail necessary to execute those recommendations — including a multi-year budget schedule, a multi-year project list, project management processes, staffing resources, and additional key performance indicators (KPIs) to track program success. The two documents are intended to be read together, with this Strategic Plan serving as the policy and investment framework and the Implementation Plan serving as the day-to-day management guide for the programmatic paving program.

5.0 Conclusion

Redmond's street network faces a significant challenge after two decades of steady decline in pavement conditions. The citywide Pavement Condition Index (PCI) has dropped from 88 (*Good*) in 2003 to 68 (*Fair*) today, and projections show further deterioration to *Poor* condition within seven years if current funding levels persist. Principal Arterials, which comprise over 14% of the network and carry the highest traffic volumes, have seen the percentage of lane-miles in *Poor* or worse condition rise from 30% in 2022 to 38% in 2025. The City's average annual investment of $1.7 million has not kept pace with inflation, increased heavy-vehicle traffic, and the growing backlog of repairs.

To reverse this trend, it is essential for Redmond to support and fully implement a formal pavement management program and to improve its budget. Modeling shows that implementing a practical, annual progressive budget scenario of $5 million, increasing it by $250,000 annually, will maintain the City's street network at an acceptable PCI of 68 (*Fair*). Leveraging some of this budget as matching funds for grant funding along with a future paving crew, will improve the street network even further, and move towards to the City's minimum target PCI of 71 (*Satisfactory*). Using the City paving crew to perform preparatory repairs and maintenance, larger preservation and rehabilitation treatments will last longer, and the street network's PCI will also improve, helping to move the City towards the minimum target PCI of 71.

A formal program and improved budget provides the structure and accountability needed to prioritize investments, leverage grant opportunities, and coordinate projects across departments. By committing to a strategic, data-driven approach and diversified funding strategy, Redmond can protect its $450 million street infrastructure investment, minimize long-term costs, and deliver safe, reliable streets that meet the needs and expectations of its residents and businesses.

APPENDIX A

Target Repair Methods for Various Conditions

TARGET REPAIR METHODS FOR VARIOUS CONDITIONS.

PCI	Condition	Functional Class	Proposed Treatment	Proposed Unit Cost
86-100	Good		Crack Seal	$2.40/SY
71-85	Satisfactory	Arterial	Preventive Maintenance (TBD)	$15/SY
71-85	Satisfactory	Collector	Double Chip Seal	$8/SY
71-85	Satisfactory	Residential	Slurry Seal	$6/SY
56-70	Fair	Arterial	2" Overlay w/Fiber	$45/SY
56-70	Fair	Collector	2" Overlay	$45/SY
56-70	Fair	Residential	Cape Seal	$12/SY
41-55	Poor	Arterial	3" Overlay w/Fiber	$64/SY
41-55	Poor	Collector	2" Overlay and Patching	$60/SY
41-55	Poor	Residential	2" Overlay and Patching	$60/SY
0-40	Failed	Arterial	Reconstruction	$190/SY
0-40	Failed	Collector	Reconstruction	$190/SY
0-40	Failed	Residential	Reconstruction	$180/SY

APPENDIX B

Budget Scenarios

Budget Scenarios

Maintain Existing Budget

ProjectPeriod	UntreatedPCI	TreatedPCI	ScenarioName	TreatmentCost
2027	67	68	$1.62 million per year	$ 1,610,000
2028	65	67	$1.62 million per year	$ 1,610,000
2029	63	66	$1.62 million per year	$ 1,610,000
2030	61	65	$1.62 million per year	$ 1,600,000
2031	59	63	$1.62 million per year	$ 1,580,000
2032	57	62	$1.62 million per year	$ 1,510,000
2033	55	61	$1.62 million per year	$ 1,610,000
2034	53	59	$1.62 million per year	$ 1,610,000
2035	51	58	$1.62 million per year	$ 1,590,000
2036	48	56	$1.62 million per year	$ 1,600,000
2037	46	55	$1.62 million per year	$ 1,600,000
2038	44	54	$1.62 million per year	$ 1,430,000

Existing Budget + $1M

ProjectPeriod	UntreatedPCI	TreatedPCI	ScenarioName	TreatmentCost
2027	67	68	$2.62 million per year	$ 2,620,000
2028	65	67	$2.62 million per year	$ 2,600,000
2029	63	67	$2.62 million per year	$ 2,350,000
2030	61	66	$2.62 million per year	$ 2,600,000
2031	59	65	$2.62 million per year	$ 2,340,000
2032	57	64	$2.62 million per year	$ 2,380,000
2033	55	63	$2.62 million per year	$ 2,610,000
2034	53	61	$2.62 million per year	$ 2,620,000
2035	51	60	$2.62 million per year	$ 2,610,000
2036	48	59	$2.62 million per year	$ 2,610,000
2037	46	58	$2.62 million per year	$ 2,610,000
2038	44	57	$2.62 million per year	$ 2,590,000

Achieve City's Target of Minimum Network PCI 71

ProjectPeriod	UntreatedPCI	TreatedPCI	ScenarioName	TreatmentCost
2027	68	69	Escalating Budget 4M+1M, 75/25	$ 4,000,000
2028	66	69	Escalating Budget 4M+1M, 75/25	$ 5,000,000
2029	64	69	Escalating Budget 4M+1M, 75/25	$ 6,000,000
2030	62	69	Escalating Budget 4M+1M, 75/25	$ 7,000,000
2031	60	70	Escalating Budget 4M+1M, 75/25	$ 8,000,000
2032	58	70	Escalating Budget 4M+1M, 75/25	$ 9,000,000
2033	56	70	Escalating Budget 4M+1M, 75/25	$ 10,000,000
2034	54	71	Escalating Budget 4M+1M, 75/25	$ 11,000,000
2035	52	71	Escalating Budget 4M+1M, 75/25	$ 12,000,000
2036	49	71	Escalating Budget 4M+1M, 75/25	$ 13,000,000
2037	47	72	Escalating Budget 4M+1M, 75/25	$ 14,000,000
2038	45	73	Escalating Budget 4M+1M, 75/25	$ 15,000,000

Achieve a Target Network PCI of 69

ProjectPeriod	UntreatedPCI	TreatedPCI	ScenarioName	TreatmentCost
2027	67	69	Escalating Budget 5M+500k	$ 4,950,000
2028	65	69	Escalating Budget 5M+500k	$ 5,450,000
2029	63	69	Escalating Budget 5M+500k	$ 5,950,000
2030	61	69	Escalating Budget 5M+500k	$ 6,450,000
2031	59	69	Escalating Budget 5M+500k	$ 6,950,000
2032	57	69	Escalating Budget 5M+500k	$ 7,450,000
2033	55	69	Escalating Budget 5M+500k	$ 7,950,000
2034	53	69	Escalating Budget 5M+500k	$ 8,450,000
2035	51	69	Escalating Budget 5M+500k	$ 8,950,000
2036	48	69	Escalating Budget 5M+500k	$ 9,450,000
2037	46	69	Escalating Budget 5M+500k	$ 9,900,000
2038	44	69	Escalating Budget 5M+500k	$ 10,400,000

Recommended Budget

ProjectPeriod	UntreatedPCI	TreatedPCI	ScenarioName	TreatmentCost
2027	68	70	Escalating Budget 5M+250, 70/30	$ 5,000,000
2028	66	70	Escalating Budget 5M+250, 70/30	$ 5,250,000
2029	64	70	Escalating Budget 5M+250, 70/30	$ 5,500,000
2030	62	69	Escalating Budget 5M+250, 70/30	$ 5,750,000
2031	60	69	Escalating Budget 5M+250, 70/30	$ 6,000,000
2032	58	69	Escalating Budget 5M+250, 70/30	$ 6,250,000
2033	56	69	Escalating Budget 5M+250, 70/30	$ 6,500,000
2034	54	69	Escalating Budget 5M+250, 70/30	$ 6,750,000
2035	52	68	Escalating Budget 5M+250, 70/30	$ 7,000,000
2036	49	68	Escalating Budget 5M+250, 70/30	$ 7,250,000
2037	47	68	Escalating Budget 5M+250, 70/30	$ 7,500,000
2038	45	68	Escalating Budget 5M+250, 70/30	$ 7,750,000

Achieve Optimum Target PCI 75

ProjectPeriod	UntreatedPCI	TreatedPCI	ScenarioName	TreatmentCost
2027	68	71	Escalating Budget 8M+250, 70/30	$ 8,000,000
2028	66	71	Escalating Budget 8M+250, 70/30	$ 8,250,000
2029	64	72	Escalating Budget 8M+250, 70/30	$ 8,500,000
2030	62	72	Escalating Budget 8M+250, 70/30	$ 8,750,000
2031	60	72	Escalating Budget 8M+250, 70/30	$ 9,000,000
2032	58	73	Escalating Budget 8M+250, 70/30	$ 9,250,000
2033	56	73	Escalating Budget 8M+250, 70/30	$ 9,500,000
2034	54	73	Escalating Budget 8M+250, 70/30	$ 9,750,000
2035	52	74	Escalating Budget 8M+250, 70/30	$ 10,000,000
2036	49	74	Escalating Budget 8M+250, 70/30	$ 10,250,000
2037	47	75	Escalating Budget 8M+250, 70/30	$ 10,500,000
2038	45	75	Escalating Budget 8M+250, 70/30	$ 9,250,000

APPENDIX D

Pavement Treatments and Definitions

Pavement Treatment Classifications

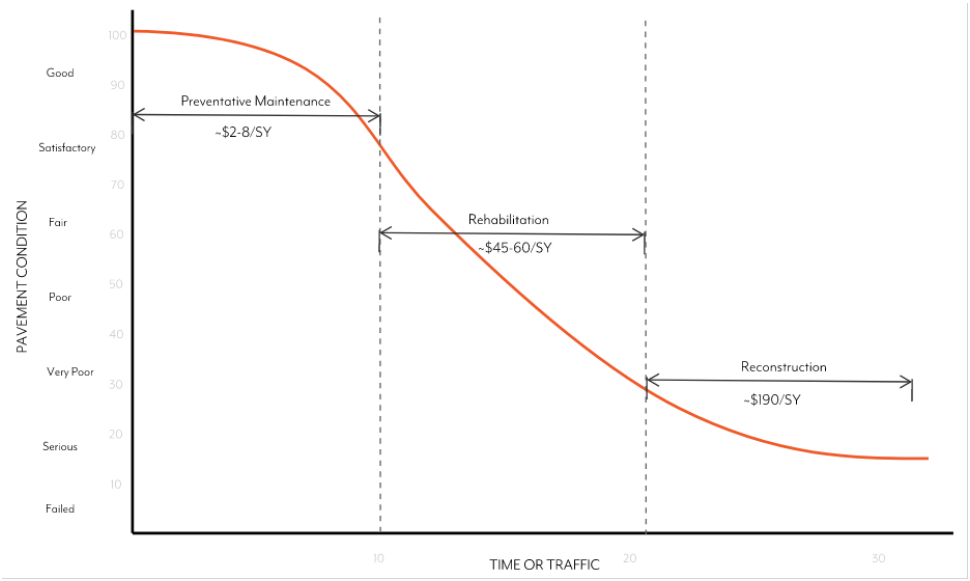
Pavement Preservation
A network-level strategy that extends pavement service life through the timely application of non-structural treatments to pavements in good to fair condition. Preservation treatments slow deterioration, maintain functional performance (ride quality, skid resistance), and delay the need for structural rehabilitation or reconstruction. Preservation is most effective when applied prior to significant structural decline.

Preventive Maintenance
A subset of pavement preservation consisting of planned, cost-effective surface treatments applied to structurally sound pavements to mitigate moisture infiltration, oxidation, raveling, and traffic-related wear. Preventive maintenance treatments address surface distress but do not increase structural capacity. Preventive maintenance treatments are applied to pavements in satisfactory or good condition, preserving the pavement condition and extending its service life. Typical treatments include crack sealing, chip seals, slurry seals, microsurfacing, cape seals, and scrub seals.

Rehabilitation
Structural or semi-structural treatments applied when pavements have deteriorated beyond the range of effective preventive maintenance but retain sufficient base and subgrade integrity. Rehabilitation improves structural capacity and restores functional performance. Common rehabilitation strategies include cold planing (milling) with asphalt overlay, structural overlays, and localized full-depth repairs.

Reconstruction
The complete removal and replacement of the pavement structure when deterioration has progressed to the point that the existing pavement, base, or subgrade no longer provides adequate structural support. Reconstruction restores full structural capacity by rebuilding the pavement section in accordance with current design standards and projected loading conditions.

Pavement Degradation Curve



Pavement Treatment Methods

Preventive Maintenance

Crack Seal PCI 86-100 **|** $1.50-2.40/SY

The placement of a hot-applied or cold-applied sealant into working cracks to prevent water infiltration and incompressible intrusion. Proper crack routing or cleaning, use of climate-appropriate sealants, and surface preparation (e.g., hot air lance cleaning) are critical to treatment performance. Crack sealing is most effective on active transverse and longitudinal cracks in pavements with adequate structural capacity.

Slurry Seal PCI 71-85 **|** $8/SY

A thin surface treatment composed of asphalt emulsion, well-graded aggregate, mineral filler, and water. Slurry seals restore surface texture, improve skid resistance, seal minor surface cracking, and retard oxidation and raveling. Slurry seals do not add structural capacity and are appropriate for pavements in good to fair condition with minimal structural distress.

Microsurfacing PCI 71-85 **|** $10/SY

A polymer-modified slurry system capable of thicker application rates and limited rut filling. Microsurfacing provides improved durability and early strength gain compared to conventional slurry seals, making it suitable for higher-volume roadways and areas requiring minor surface profile correction.

Chip Seal PCI 71-85 **|** $8/SY

A surface treatment consisting of the application of asphalt binder followed by a layer of uniformly graded aggregate. The aggregate is embedded into the binder to create a new wearing surface that seals minor cracks, reduces raveling, and limits moisture infiltration. Multiple applications (double or triple chip seals) may be used to enhance durability and structural contribution.

Scrub Seal PCI 71-85 **|** $8/SY

A variation of chip seal in which asphalt emulsion is mechanically broomed into surface cracks prior to aggregate placement. Scrub seals are intended to enhance crack sealing effectiveness while providing the surface protection of a conventional chip seal.

Cape Seal PCI 56-70 **|** $12-14/SY

A composite treatment consisting of a chip seal followed by a slurry seal or microsurfacing. The chip seal provides crack sealing and surface waterproofing, while the slurry or microsurfacing layer improves ride quality and surface uniformity. In urban environments cape seals are used more often than chip seals to reduce loose aggregate generated during the application of chip seals.

Rehabilitation

Cold Planing (Milling) and Asphalt Overlay PCI 40-70 **|** $45-64/SY

The controlled removal and replacement of an existing asphalt surface with new asphalt to a specified depth to correct surface irregularities, restore cross slope, remove distressed material, or prepare the pavement for overlay. Milling may be combined with localized full-depth repairs prior to placement of a new asphalt wearing course. Variations in thickness can be used to restore a roadway crown, improve drainage, and add structural capacity.

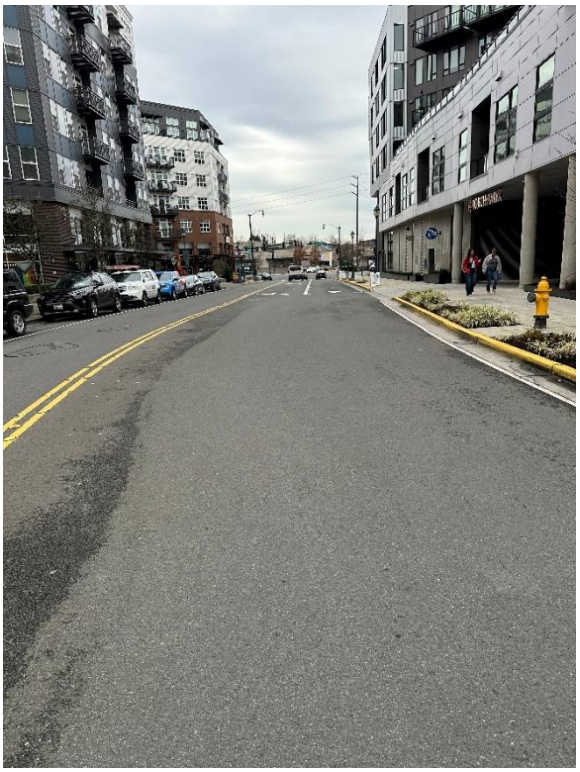
Reconstruction

Full Depth Reconstruction PCI 0-40 **|** $180-190/SY

Removal of the existing pavement structure, including asphalt layers and base materials, followed by subgrade evaluation and preparation, and construction of a new pavement section. Reconstruction addresses structural deficiencies at all levels of the pavement system and restores long-term structural performance.

APPENDIX E

Photos of Example Pavement Condition



Cleveland Street – PCI 97

Redmond Way – PCI 83

Redmond Way – PCI 60

Avondale Road – PCI 36

Avondale Road – PCI 24

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