2030 PAVEMENT MANAGEMENT PLAN

EL DORADO
KANSAS

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City of El Dorado, Kansas
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1. INTRODUCTION

This Pavement Management Plan ensures the City of El Dorado's 250.2-lane-mile roadway network remains safe, functional, and cost-efficient. The plan leverages $700,000 annually from sales tax revenue, along with other funding sources to support street maintenance projects, focusing on different treatment types.

2. PAVEMENT NETWORK OVERVIEW

Roadway Types and Maintenance Strategies

Asphalt (214.9 lane miles / 1,512,858.24 SY)

- 86% of the street network
- 45% PASER 7-10, 30% PASER 5-6
- primary focus for treatments.

Brick (1.4 lane miles / 9,951.41 SY)

- Historic Areas
- 80% PASER 5-7; preservation maintains character.

Concrete (7.7 lane miles / 54,202.95 SY)

- PASER 8-10
- Joint sealing prioritized.

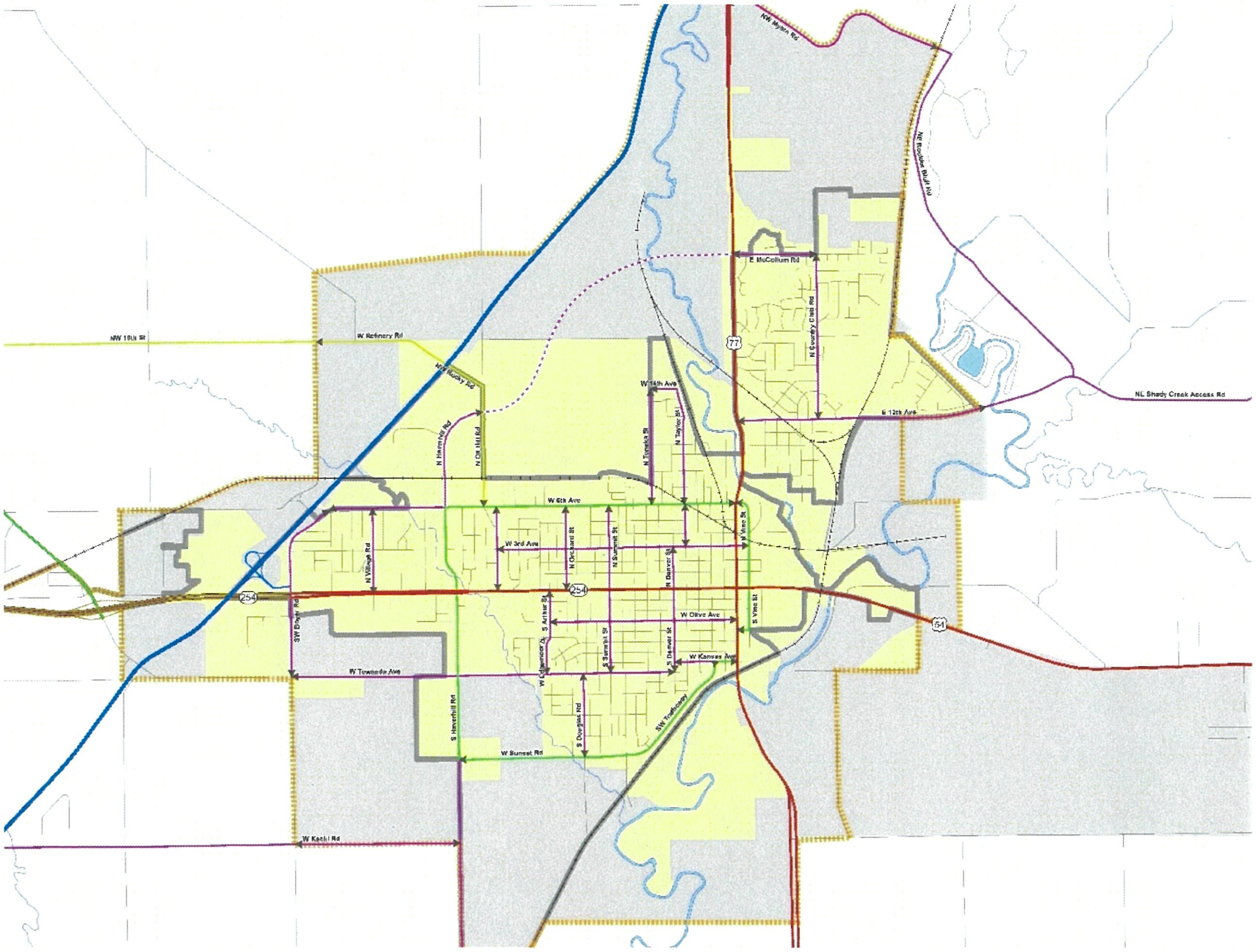
Unimproved (32.6 lane miles / 229,277.82 SY)

- 90% PASER 1-3
- Deferred due to policy/lack of development adjacent

Functional Classification

The city classifies streets based on **traffic flow, usage, and connectivity**:

- **Local Roads (192 lane miles / 1,351,734.80 SY)**
  - Primarily residential streets, providing direct access to homes and businesses.
  - Requires low-cost maintenance strategies such as crack sealing, chip seals, or minor rehabilitation.
- **Collector Roads (44.5 lane miles / 313,468.23 SY)**
  - Serve as connectors between local streets and arterial roads, carrying moderate traffic volumes.
  - Support neighborhood access and commercial activity, requiring periodic resurfacing and rehabilitation.
- **Arterial Roads (58.2 lane miles / 409,697.81 SY)**
  - Designed for high-capacity traffic movement, providing critical regional connectivity.
  - Require frequent resurfacing, mill & overlay, or full-depth reconstruction to maintain capacity, safety, and efficiency.



The El Dorado Transportation Plan integrates traffic volume data, congestion patterns, and multimodal needs to guide investments in the pavement network. This data-driven approach ensures that each classification receives appropriate maintenance strategies tailored to usage, condition, and projected lifespan.

3. HISTORICAL BACKGROUND OF STREETS IN EL DORADO

The street network of El Dorado, Kansas, encompassing 250.2 lane miles, traces its roots to the city's 1868 founding, evolving from dirt paths into a structured system shaped by oil-driven growth and deliberate policies. Early unpaved and rudimentary streets gave way to brick paving in the historic core during the early 20th-century oil boom. Asphalt later dominated, spanning the city.

In 1975, Resolutions No. 1299 and 1300 established foundational policies. Resolution No. 1299 required the city to maintain gravel streets with equipment and labor, billing property owners for surfacing materials during reconstruction, aiming to keep basic access affordable while encouraging upgrades. Resolution No. 1300 banned new substandard streets and limited city maintenance of deteriorated unimproved city streets seal-coated/thin-overlay streets to three

years post-resurfacing, after which property owners funded repairs or reverted to gravel maintenance. This discouraged temporary fixes and perpetual pavement sections to reduce long-term costs.

A 1989 sales tax created a funding source, dedicating $500,000 annually to maintain improved streets. This policy ensured robust upkeep for 86% of the network while leaving gravel and substandard streets to property owner or developer funding via assessments, aligning with a philosophy of equitable cost distribution.

Resolution No. 2249 (1999) prioritized substandard street upgrades by traffic volume and condition, targeting arterials and collectors for city-initiated paving under K.S.A. 12-6a. Its mixed success—some projects stalled by owner petitions—led to Resolution No. 2832 in 2002. This refined policy prioritized principal arterials (>6000 vpd), minor arterials (1000-6000 vpd), collectors (500-1000 vpd), and local streets (<500 vpd) based on traffic, pavement state, safety, and drainage needs, while limiting arterial paving to one per year for utility coordination and capping assessments at two over three years to ease owner burden. It shifted local street paving to petitions, focusing city efforts on high-impact routes.

Subdivision regulations evolved over the years, ensuring new development met standards, and reducing future maintenance costs.

These policies produced a network bolstered by sales tax and state funds for rehabilitation and preservation. El Dorado's Street history reflects a strategic balance of standardization, cost efficiency, and community benefit.

4. FUNDING

Sales Tax

The City of El Dorado has relied on voter-approved sales tax allocations to ensure a sustainable funding source for street maintenance and improvements. These funds have been used to:

- Finance ongoing street maintenance programs, such as resurfacing and full-depth reconstruction, surface treatments, and rehabilitation since 1989.
- Available annual funds for street rehabilitation in 2025 and forward $**700,000**
- Sales tax funds are only to be utilized on improved City Streets

Connecting Link Agreement KDOT

The City of El Dorado receives **$137,710.00** annually from KDOT to assist in maintaining the following **Connecting Links** within the city limits:

- **K-254** – 3.434 miles
- **U.S. 54** – 1.533 miles

- **U.S. 77** – 3.011 miles

Federal Fund Exchange

The City of El Dorado participates in the Federal Fund Exchange (FFE) Program administered by the Kansas Department of Transportation (KDOT). This program allows local public agencies to exchange their allocated federal transportation funds for state transportation dollars at an exchange rate of $0.90 in state funds for every $1.00 in federal funds.

For the federal fiscal year 2024, El Dorado has been allocated $178,062.05 in federal funds, which, after the exchange, results in $160,255.85 available in state funds for local transportation projects. This fund exchange provides greater flexibility, as it allows the City to utilize state funds without the stringent requirements of federal-aid projects, reducing administrative burdens and expediting project implementation.

Special City Highway Fund and Gas Tax

The City of El Dorado receives funding for road maintenance and improvements from two key sources:

- **Special City/County Highway Fund (4351):** Allocated by KDOT from state fuel taxes, these funds support street construction, repair, and maintenance.
- **Gas Tax Refund (4354):** Provides reimbursements for fuel used in non-highway applications, contributing to local transportation funding.

For fiscal year 2025, total revenue from these sources is projected to remain at **$355,870**, with the Special City/County Highway Fund being the largest contributor. These funds are essential for maintaining El Dorado's road network.

5. PUBLIC STREET CONDITION DASHBOARD & DATA COLLECTION METHODS

The Public Street Condition Dashboard (ArcGIS) is a data-driven system designed to enhance the efficiency, transparency, and cost-effectiveness of pavement management. By integrating AI-driven assessments, GIS mapping, and PASER ratings, the city is able to prioritize maintenance, allocate resources effectively, and plan for future improvements. The City of El Dorado, consultant with Professional Engineering Consultants to deliver a Pavement Condition Assessment Dashboard.

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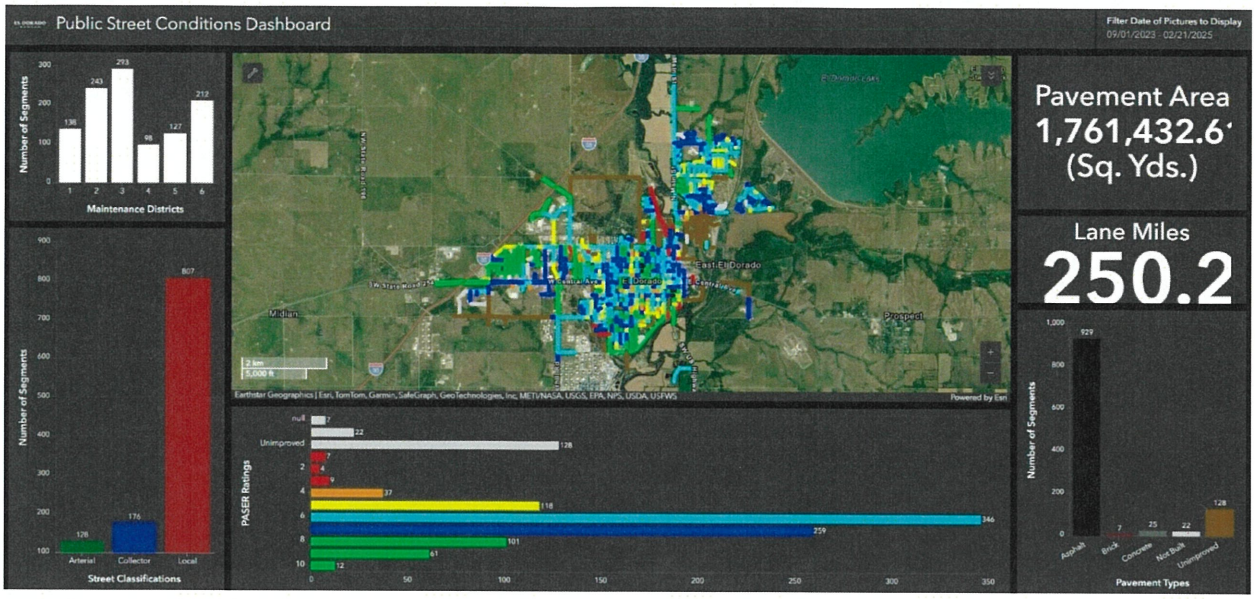

AI-Based Pavement Condition Monitoring

El Dorado has adopted AI-powered image analysis to conduct pavement condition assessments.

- Automated cameras and sensors mounted on municipal vehicles continuously scan road surfaces.
- Machine learning algorithms analyze cracks, potholes, and pavement distress, generating consistent, objective condition ratings.
- AI-powered detection allows for early identification of problem areas, preventing minor defects from escalating into major failures.

GIS Mapping and Data Visualization

The city's GIS-based dashboard provides:

- A visual representation of pavement conditions across the entire street network.
- Layered data overlays to compare current conditions with historical trends.
- Wear pattern analysis, helping engineers identify areas with accelerated deterioration.
- Integration with long-term capital improvement planning, ensuring data-driven decision-making.

6. PASER RATING SYSTEM AND PAVEMENT ASSESSMENTS

The Pavement Surface Evaluation and Rating (PASER) system is a visual inspection method used to classify pavement conditions and determine appropriate maintenance strategies.

Visual Rating Methodology

The PASER system categorizes pavement condition from 1 to 10, with higher scores indicating better pavement conditions.

PASER Rating	Condition	Maintenance Strategy
10-8	Excellent	Preventative maintenance (crack sealing, surface treatments)
7-5	Good/Fair	Minor rehabilitation (micro-surfacing, thin overlays)
4-3	Poor	Major resurfacing (mill & overlay, structural overlays)
2-1	Failed	Full-depth reconstruction

Integration with Maintenance Planning

- High-scoring roads (8-10 PASER) require only preventative maintenance to extend lifespan.
- Moderately deteriorated roads (5-7 PASER) need resurfacing or minor rehabilitation before structural damage occurs.
- Lower-rated roads (3-4 PASER) require structural reinforcement, such as mill & overlay or full depth patching combined with minor rehabilitation.
- Severely deteriorated roads (1-2 PASER) require full-depth reconstruction, addressing both the surface and subgrade.

7. PAVEMENT TREATMENT TYPES AND COST ANALYSIS

CRACK SEALING

Paser Range 8-10
$1 Per SY

- Prevents Moisture Infiltration
- Used For Local Roads

PAVEMENT REJUVENATOR

Paser Range 7-10
$1.50 Per SY

- Restores Binder Flexibility
- Not Suitable For High Traffic Roads

HIGH DENSITY MINERAL BOND

Paser Range 6-8
$4 Per SY

- Thin Durable Layer
- Prevents Oxidative Damage To Surface
- Used for Local Roads

MICRO-SURFACING

Paser Range 5-7
$5 Per SY

- Extends Pavement Life
- Applied To Both Local And Collector Streets

THIN HMA OVERLAY

Paser Range 4-6
$10-15 Per SY

- Restores Friction & Surface Quality
- Can Be Used For All Road Types

MILL & OVERLAY

Paser Range 3-5
$18-25 Per SY

- Structural Repair
- Usually Necessary For Collectors, Arterials, & Some Local Roads

FULL RECONSTRUCTION

Paser Range 1-3
$80-120 Per SY

- Complete Rebuild Of Road
- Used For Failed Pavements Requiring Subgrade Repair

Pavement maintenance and rehabilitation treatments are carefully selected based on road classification, traffic volume (measured as Vehicle Per Day or VPD), load types, and the current condition of the pavement. Not every treatment is appropriate for every road due to these variables, ensuring that resources are allocated efficiently, and pavement longevity is maximized.

Road Classification and Traffic Volume (VPD):
Roads are typically classified as arterial, collector, or local, each serving different traffic volumes and purposes. Arterial roads handle high VPD and heavy traffic loads, including trucks and buses, requiring robust treatments like mill & overlay or thin HMA overlay to withstand significant wear and tear. Collector roads manage moderate VPD and mixed traffic, often necessitating treatments such as micro-surfacing or crack sealing to address surface defects while maintaining structural integrity. Local roads, with lower VPD and lighter loads, typically require less intensive maintenance like patching or crack sealing, which are cost-effective for addressing minor deterioration without over-investing in structural repairs.

Load Types and Pavement Durability:
Load types, including the weight and frequency of vehicles (e.g., passenger cars vs. heavy trucks), significantly influence pavement deterioration. Arterial roads, designed for heavy commercial vehicles, experience greater stress, leading to cracking, rutting, and structural failure over time. These roads benefit from durable treatments like mill & overlay or thin HMA overlays to reinforce the pavement and handle such loads effectively. Collector roads, with moderate loads, may require intermediate treatments like micro-surfacing to extend pavement life without extensive reconstruction. Local roads, carrying lighter loads and fewer vehicles, can often be maintained with simpler treatments like crack sealing or patching, which address surface issues without the need for major structural interventions.

Pavement Condition and Treatment Appropriateness:
The condition of the pavement, often assessed through systems like PASER ratings, guides treatment selection. Roads in better condition (e.g., higher PASER ratings) may only need preventive maintenance like crack sealing or micro-surfacing to protect against future deterioration. Roads in poorer condition (e.g., lower PASER ratings) may require more extensive treatments like patching or thin HMA overlays to restore structural integrity. Applying a heavy-duty treatment like mill & overlay to a low-traffic local road could be inefficient and wasteful, while using a light treatment like crack sealing on a high-traffic arterial road would fail to address underlying structural needs, leading to premature failure.

Cost-Effectiveness and Resource Allocation:
Selecting the appropriate treatment for each road type ensures cost-effective use of public funds. High-traffic arterial roads, requiring significant investment in durable treatments, justify higher funding allocations to maintain functionality and safety. Collector roads, with moderate traffic, benefit from balanced treatments that extend pavement life at a reasonable cost. Local roads, with low traffic and lighter loads, are best served by minimal, cost-efficient maintenance, avoiding unnecessary expenditure on treatments designed for heavier use.

8. FIVE YEAR CAPITAL IMPROVEMENT PROGRAM (2025-2030)

(Refer to excel sheet for complete information)