

**Preliminary Engineering Report**  
**City of Oregon, Missouri**  
**Street Improvement Project**  
**February 12, 2024**

**Owner:**

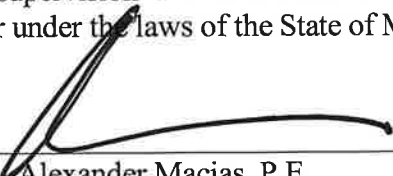
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**I HEREBY CERTIFY** that this report was prepared by me or under my direct personal supervision and that I am a duly Registered Professional Engineer under the laws of the State of Missouri.



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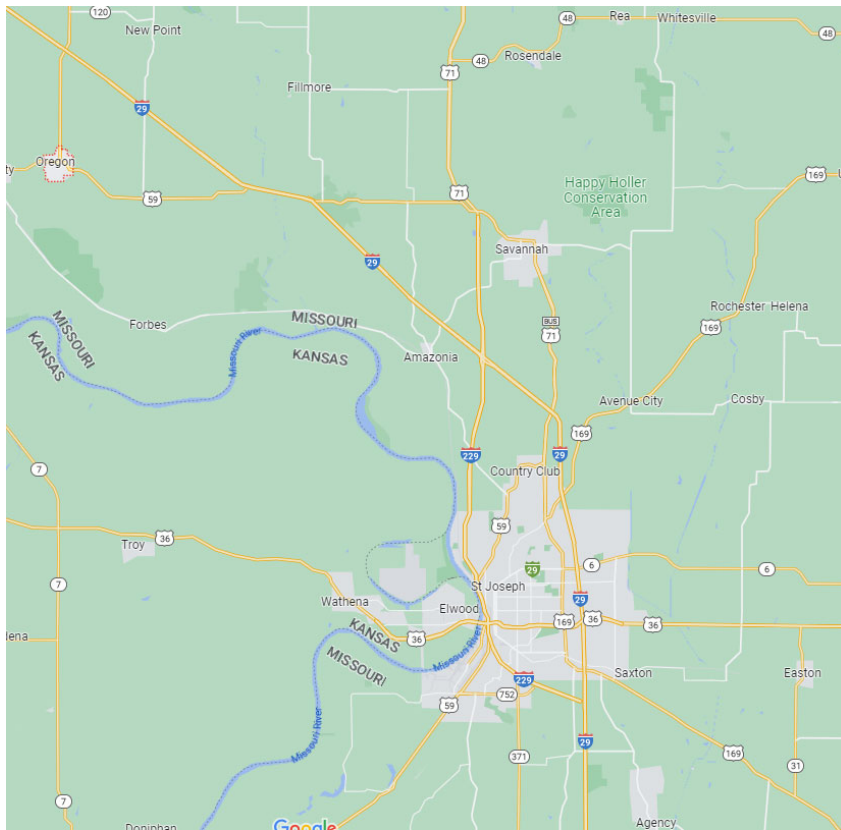
# CHAPTER 1

## GENERAL INFORMATION

### BACKGROUND

The City of Oregon, in Holt County, is located 27 miles northwest of St. Joseph. The City has a population of approximately 837 residents. See Figures 1-1 and 1-2 for a location and layout map of the city.

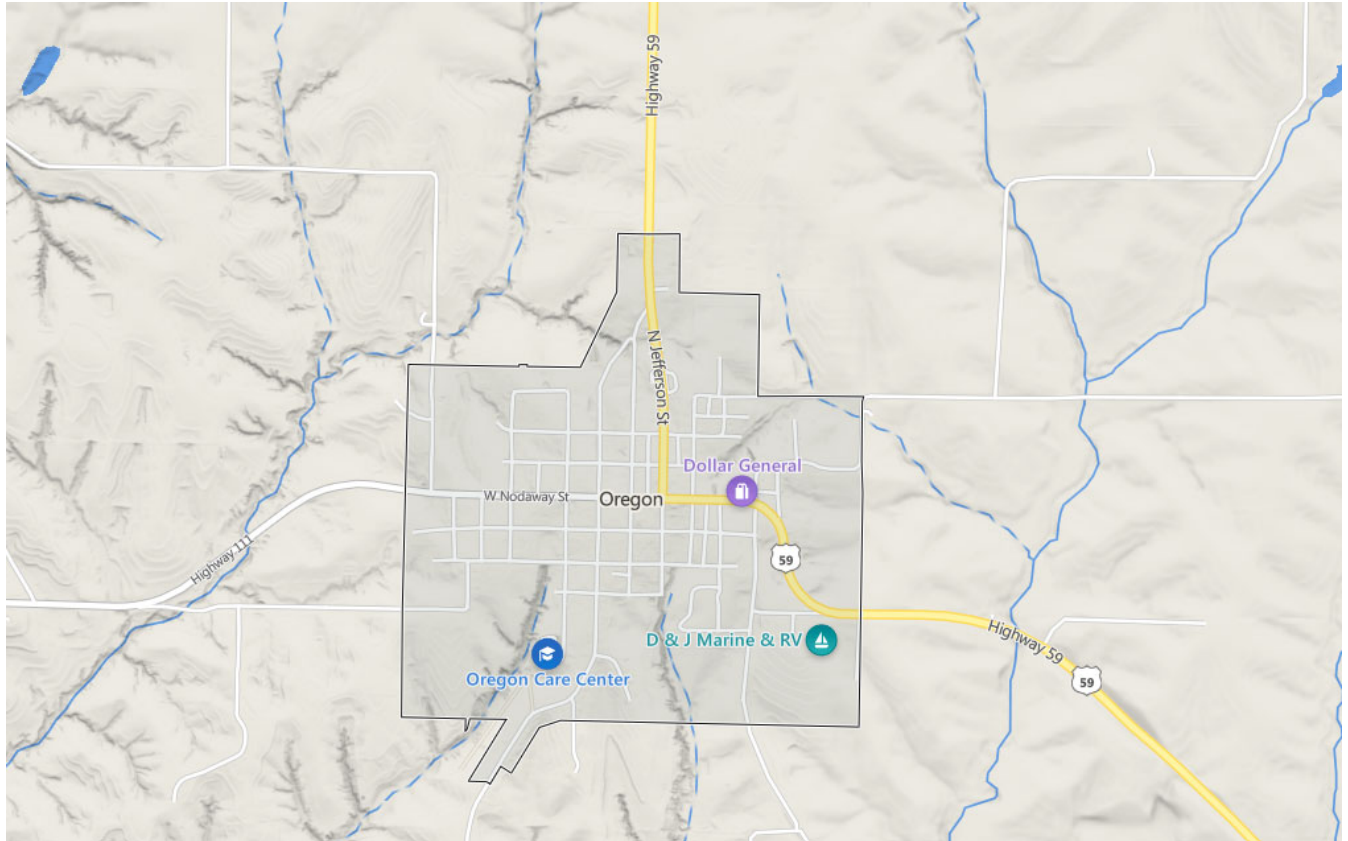
Figure 1-1: Locator Map



A brief summary of the City street system:

1. The City maintains approximately 39,373 ft (7.46 mi) of streets.
2. The City has identified 88,883 SY of streets and parking areas that are in need of an overlay with 7,615 SY of those streets having a severe need of repair and two lift resurfacing.
3. Drainage improvements are also necessary and involve ditching and paved drainage. The culverts will be part of the contract. The project will include some asphalt paving of the shoulder and ditches creating a swale at the ditch lines for erosion control. There may be minor ditching work to be performed by the city prior to the project being let and awarded.

Figure 1-2: City Layout



## SCOPE

The purpose of this report is to provide a reasonable level of preliminary engineering to determine the expense of reconstructing the city streets outlined in this report.

The estimated project cost is adequate for a preliminary study but may vary from actual construction cost due to changes in material cost, bidding environment, and site-specific conditions. Any recommendations made in this report should be confirmed during final design.

## CHAPTER 2

### EXISTING CONDITIONS

#### POPULATION

The 2020 census reported a population of 837 residences and 356 households for the City of Oregon. Based on the population data presented in Figure 2-1, the population of Oregon has been in a decline as well as Holt County since 1910.

**MEDIAN HOUSEHOLD INCOME** Median Household Income (MHI) for the City of Oregon and Holt County is \$53,977 and \$52,500, respectively. Figure 2-2 indicates the household income range as reported by the US Census Bureau 2021 5-year estimates.

Figure 2-1: Historical Population Data

Year	City of Oregon	Holt County
1910	1002	14,539
1920	904	14,084
1930	922	12,720
1940	978	12,476
1950	870	9,833
1960	887	7,885
1970	789	6,654
1980	901	6,882
1990	935	6,034
2000	935	5,351
2010	857	4,912
2020	837	4,223

Population values are based on US Census Bureau records

Figure 2-2: Median Household Income (MHI)

		City of Oregon	Holt County
Total Households		385	2,418
Income Range	Less than \$50,000	18.3%	21.4%
	\$50,000 to \$99,999	45.5%	28.9%
	\$100,000 to \$149,999	23.4%	14.5%
	\$150,000 to \$199,999	9.4%	15.5%
	\$200,000 to \$299,000	3.0%	12.7%
	\$300,000 to \$499,000	40.0%	4.0%
	\$500,000 to \$999,999	0.0%	2.9%
	\$1,000,000 or more	0.0%	0.0%
<b>Median Income</b>		<b>\$ 53,977.00</b>	<b>\$ 52,500.00</b>

(Median Income in Missouri is \$61,847)

## **STREET MAINTENANCE FUND**

The street maintenance fund receives annual funding from Missouri Department of Revenue (DOR). The funding from DOR is in the form of fuel tax, motor vehicle sales tax, motor vehicle license tax, and use tax. In addition to the DOR funds, the city has a general sales tax passed in 2021 and a use tax passed in 2022 which provides funding for the city operations including the street fund.

Gross receipts for all taxes were \$154,153.33 in 2023, which assists in funding the street department. The annual funds are utilized to pay for fuel, snow removal, equipment maintenance, portion of staff salaries associated with streets, and other expenses associated with road maintenance. The reserve account has a current balance of approximately \$7,529 as of January 2024.

## EXISTING ROAD CONDITIONS

The following photos provide a representative example of the current city street road conditions in Oregon.

Figure 2-3:

**Barbour Avenue**

Existing asphalt Pavement  
Pavement failure  
Patch for water valve



Figure 2-4:

**Barbour Avenue**

Existing Asphalt Near US 59  
Asphalt Scaling, Edge deterioration,  
Lack of Edge Drainage





Figure 2.5

**North Chester Street**

Gravel Surface

Limited Roadway Edge Drainage



Figure 2.6

**South Main Street**

Deteriorated Asphalt, Paved Parking and

Curb and Sidewalk

Parking areas to be milled and overlaid



Figure 2.7

**Harrison Street**

(End of street)

Deteriorated Asphalt

Limited Roadway Edge Drainage



Figure 2.8

**Madison Street**

Deteriorated Asphalt, Paved Parking and

Curb and Sidewalk



Figure 2.9

**North Washington Street**

Looking south at Elm Street

Deteriorated Asphalt

Limited Roadway Edge Drainage



Figure 2.10

**South Ridge Drive**

Looking Northwest

Deteriorated Asphalt, Paved Parking and



Figure 2.11

**South Washington Street**

Looking south at S Ridge Dr  
Asphalt in fair condition  
Ditches and fill slope drainage



Figure 2.12

**Walnut Street**

Looking North  
Asphalt in Fair Condition  
Shallow Ditch or fill slope drainage.



Figure 2.13

**Adams Street**

Looking north at Co Road 290  
Asphalt in fair condition  
Ditches and fill slope drainage



Figure 2.14

**West Nodaway Street**

Looking North at Chestnut Street  
Asphalt in poor Condition with gravel sections  
Shallow Ditch or fill slope drainage.  
Poor Cross-slope



Figure 2.15

**S. Washington Street**

At First Christian Church

Asphalt in poor to fair condition

Parking Area needs to addressed

Drainage pipe and asphalt swale gutter



Figure 2.16

**West Elm Street**

Looking North at N Washington Street

Asphalt in poor Condition

Shallow Ditch and curb and gutter sections.

Poor Cross-slope.



Figure 2.17

**South Main Street**

At East Missouri looking east  
Asphalt in poor to fair condition  
Parking Areas needs to addressed  
(Mill and overlay



Figure 2.18

**Harrison Street**

Looking South at Spruce Street  
Asphalt in poor to fair condition  
Shallow ditches or fill sections.  
Poor roadway edge



Figure 2.19

**East Missouri Street**

At South Jefferson looking west  
Asphalt fair condition  
Paved draingae needs to be overlaid

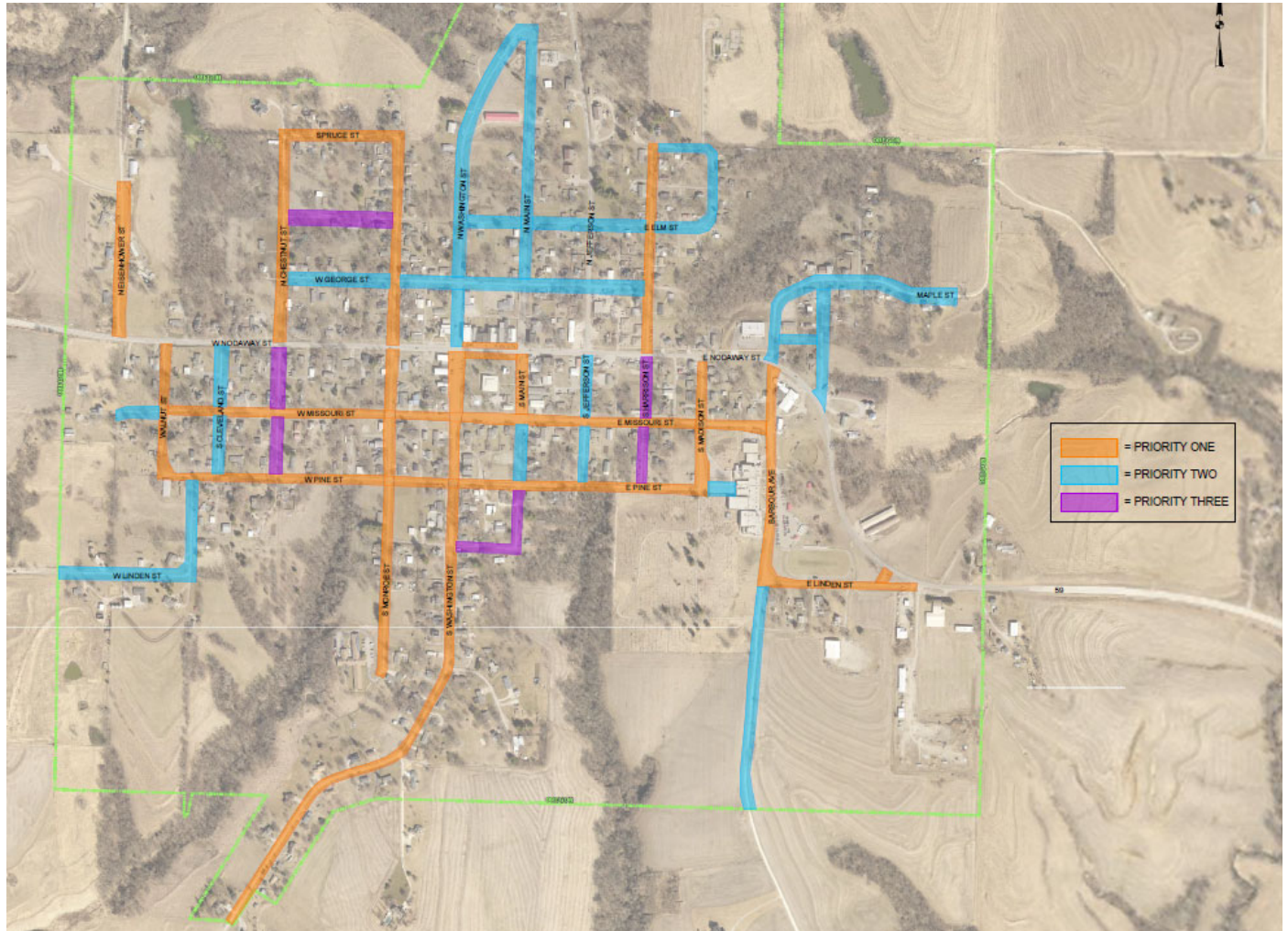


# CHAPTER 3

## PROJECT RECOMMENDATIONS AND COSTS

Figure 3-1 Illustrates all the city streets in Oregon, Missouri listed in three priority levels for the proposed improvements. The streets were chosen by the City Council based on the condition of the roadway and are highlighted in orange as a level 1 priority, highlighted in blue as a level 2 priority and highlighted in purple as a level 3 priority.

Figure 3-1: Proposed Improvement Map



The streets selected for Level 1 Priority total approximately 52,383 SY of roadway in area and represent 60% of the total streets. If the Level 1 Priority streets are completed as proposed, 60% of the total streets in Oregon will be addressed with this grant.



Figure 3-2 indicates the anticipated cost of the proposed resurfacing of all the City of Oregon streets:

Figure 3-2: Estimated Project Cost

Item No	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$50,000.00	\$50,000.00
2	Traffic Control	LS	1	\$30,000.00	\$30,000.00
3	Asphaltic Pavement	Ton	11,935	\$100.00	\$1,193,500.00
4	Milling	SY	9,610	\$3.00	\$28,830.67
5	Tack Coat	Gallons	12,450	\$2.00	\$24,900.00
6	Utility Adjustments	LS	1	\$35,000.00	\$35,000.00
7	Paved Drainage	LS	1	\$25,000.00	\$25,000.00
Total Construction					\$1,387,230.67

Additional cost associated with Engineering and Grant Administration

<b>Design</b>	-	\$75,000.00
<b>Inspection</b>	-	\$55,000.00
<b>Grant Admin</b>	-	\$30,000.00
<b>Construction</b>	-	<u>\$1,387,230.67</u>
<b>Project Total Estimate</b>	-	\$1,547,230.67

## IMPROVEMENT METHOD

As the photos in section 2 indicate, the streets are in fair to poor deteriorated condition. The road surface is a combination of hot mix surfacing to gravel with patches of deteriorating pavement, gravel, and dirt. The street subgrade has been undermined by potholes that have formed due to freeze/thaw action combined with vehicle loads. Most street sections can be repaired in place with new hot mix asphalt in single or multi-lifts being the recommended surface repair.

The following repair method is the basis for the costs indicated in figure 3-2:

1. Overlay the city streets with 2 inches of hot mix asphaltic pavement. The surface shall be broomed and tacked with an asphalt liquid emulsion. Large debris such as rocks or asphalt chunks should be completely removed.
2. Grade and shape roadside ditching where possible to provide improved drainage. Shaping the road subgrade with a crown at centerline may need to be performed in isolated locations.
3. Place an additional 2-inch asphalt hot mix asphaltic pavement lift in isolated areas where the existing surface is gravel or in a poor condition.
4. Mill and fill street sections with parking areas and sections with curb and gutter.
5. Add paved drainage along East Missouri Street, east of Main Street to control erosion.

## PROJECT ALTERNATIVES

The goal of this project is to improve the streets to a condition that can be maintained using routine methods. The available alternatives are 1) overlay all city streets in a single project, 2) overlay the priority level 1 streets and do nothing to the remaining streets, 3) choose a less expensive alternative that will seal the streets, which will not fix any potholes or surface irregularities, 4) “do nothing” to all the streets. Regardless of surface material type, the current street condition will require improvements and repair in various sections in order to provide an adequate supporting base beneath the road surface.

Alternates include double chip seal course or concrete pavement street reconstruction. The concrete alternate costs approximately \$250,000 per block and does not allow for widespread impact to the community, with approximately 5 blocks to be improved. The chip seal alternative costs approximately \$10.00 per square yard, which would total approximately \$900,000 for the entire street system and would not address the deteriorated asphalt street sections.

This report recommends the usage of a hot mix asphalt pavement surface which will address the deteriorated city street sections and provide the best cost. Hot mix asphalt pavement materials are near 1.5 times the cost of a double chip seal and will address the street repairs needed. The decision to utilize hot mix asphalt will maximize the city repairs and funding to improve the roads.

A “do nothing” alternative will occur if the project does not receive funding and the road surfaces will remain in poor condition and continue to deteriorate.

**Figure 3-4: Project Estimate**

All City Streets

Item No	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$50,000.00	\$50,000.00
2	Traffic Control	LS	1	\$30,000.00	\$30,000.00
3	Asphaltic Pavement	Ton	11,935	\$100.00	\$1,193,500.00
4	Milling	SY	9,610	\$3.00	\$28,830.67
5	Tack Coat	Gallons	12,450	\$2.00	\$24,900.00
6	Utility Adjustments	LS	1	\$35,000.00	\$35,000.00
7	Paved Drainage	LS	1	\$25,000.00	\$25,000.00
Total Construction					\$1,387,230.67

**Figure 3-5: Project Estimate per Priority List**

Priority Level 1

Item No	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$50,000.00	\$50,000.00
2	Traffic Control	LS	1	\$10,000.00	\$10,000.00
3	Asphaltic Pavement	Ton	7,533	\$100.00	\$753,300.00
4	Milling	SY	8,510	\$3.00	\$25,530.00
5	Tack Coat	Gallons	7,810	\$2.00	\$15,620.00
6	Utility Adjustments	LS	1	\$18,000.00	\$18,000.00
7	Paved Drainage	LS	1	\$25,000.00	\$25,000.00
Total Construction					\$897,450.00

Priority Level 2

Item No	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$50,000.00	\$50,000.00
2	Traffic Control	LS	1	\$10,000.00	\$10,000.00
3	Asphaltic Pavement	Ton	4,211	\$100.00	\$421,100.00
4	Milling	SY	75	\$10.00	\$750.00
5	Tack Coat	Gallons	4,435	\$2.00	\$8,870.00
6	Utility Adjustments	LS	1	\$12,000.00	\$12,000.00
Total Construction					\$502,720.00

Priority Level 3

Item No	Description	Unit	Estimated Quantity	Unit Price	Extended Price
1	Mobilization	LS	1	\$50,000.00	\$50,000.00
2	Traffic Control	LS	1	\$10,000.00	\$10,000.00
3	Asphaltic Pavement	Ton	465	\$100.00	\$46,500.00
4	Milling	SY	25	\$10.00	\$250.00
5	Tack Coat	Gallons	500	\$2.00	\$1,000.00
6	Utility Adjustments	LS	1	\$5,000.00	\$5,000.00
Total Construction					\$112,750.00

**PROJECT FINANCING**

The project funding should consider multiple sources to fund the entire project. The primary funding of the project will utilize a dedicated tax bond with the addition of CDBG funds as a supplementary funding source. The city will contribute to the cost with the tax bond and yearly funds as well for any ditching work from the city street repair budget. The proposed breakdown is:

**Dedicated Tax Bond** - \$1,100,000  
**CDBG** - \$ 500,000  
**Local Funds** - \$ 40,000  
**In-Kind** - \$ 5,000  
**Total** - \$ 1,645,000

**PROJECT SCHEDULE**

	2024												2025						
	Jan-24	Feb-24	Mar-24	Apr-24	May-24	Jun-24	Jul-24	Aug-24	Sep-24	Oct-24	Nov-24	Dec-24	Jan-25	Feb-25	Mar-25	Apr-25	May-25	Jun-25	Jul-25
<b>Project Schedule</b>																			
PER for Funding Application																			
Grant Award Announced																			
Contract Approval																			
Design																			
Environmental																			
Plans and Specifications																			
Contract Document Approval																			
Advertising and Award of Contract																			
Approval of Bid Documents																			
Bidding Period																			
Construction																			
Project Closeout																			

## **CHAPTER 4**

### **RECOMMENDATIONS**

#### **REVIEW AND FUNDING**

It is recommended this report be submitted to MO-KAN Regional Council for review and Community Development Block Grant (CDBG) for review and comments.

#### **STREET REPLACEMENT**

During project design the streets listed in the base project should be reprioritized as defined by the city as being in the worst condition. A thorough list of the streets should be compiled and presented in the bidding documents to utilize the project funds available. The alternates should be listed in order from highest to lowest priority if the project is split into alternates as defined in the priority list.

#### **MAINTENANCE PLAN**

Once the street overlay project has been completed it is recommended the pavement surface be resealed with a coat of chip seal every 4-5 years or patched and overlaid every 10 years. Maintaining a sealed pavement surface reduces the entrance of water into the street base and maintains the stability and support of the driving surface. A chip seal maintenance coat is anticipated to cost \$5.00 per SY. A street overlay is estimated at \$17.00-\$18.00 per SY.

All city streets combined total approximately 86,923 SY of surface. The city should evaluate its operating budget and tax revenue sources to develop a funding plan and use the budgeted amount to determine the amount of streets to be sealed or overlaid each year.

#### **ENVIRONMENTAL**

This project proposes the reconstruction of existing streets, and no environmental impact is anticipated. All work will occur on existing street right-of-way and no easements or land acquisition will be required.

#### **SUMMARY**

The purpose of this report is to provide a reasonable level of preliminary engineering to determine a project scope, quantities, and cost associated with road replacement. The values utilized for construction cost and maintenance are based on experience and research. The costs may vary with time as the value of materials, labor rates, and professional services are subject to fluctuations due to market forces. The priority of street replacement, quantities, and construction costs should be further confirmed during final design.

#### **CONSTRUCTION TIMELINE**

Construction timeline is estimated to be 30 to 45 working days.