



PUBLIC WORKS

PAVEMENT

MANAGEMENT

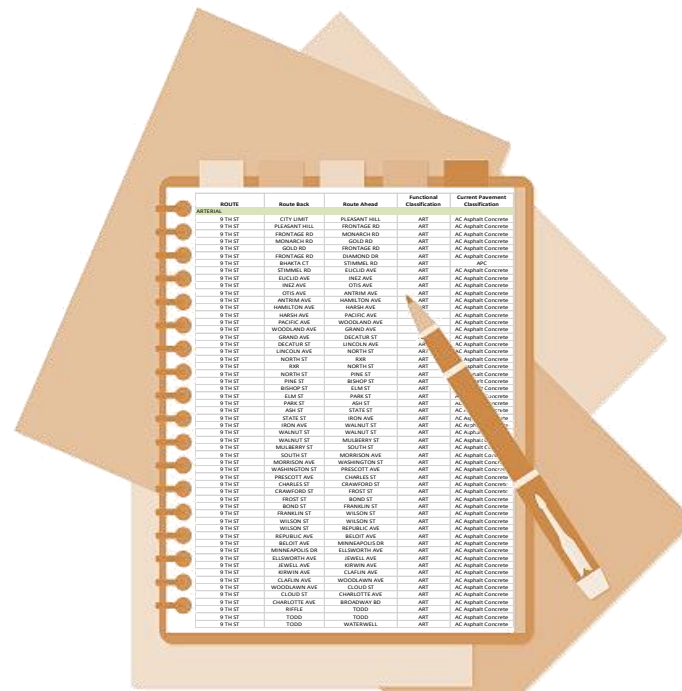
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REVIEW, ANALYSIS AND RECOMMENDATIONS



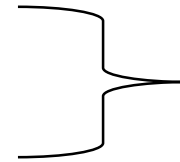
# Agenda

- ✓ Salina's Pavement Management Program
- ✓ Process Improvement
- ✓ Application and Crack Seal Cycles
- ✓ 2022 Plan Summary
- ✓ Pressures
- ✓ Cost Analysis
- ✓ Options
- ✓ Risks
- ✓ Summary, Recommendations, and Questions



# Salina Pavement Inventory

Street Composition	Ratio
Asphalt	60%
Concrete	34%
Brick	3%
Unimproved	3%
Total	100%



In 2022, staff has focused on that portion of the inventory that provides the greatest opportunity for system improvement - asphalt streets and asphalt over Portland cement (APC) applications with PCIs of 15-40 (poor rating).



# Most Recent Pavement Condition Ratings

## Asphalt

Failed (0)

Poor (3)

Fair (773)

Excellent (875)

163

58%

1,384

## Concrete

Failed (0)

Poor (160)

Fair (611)

Excellent (265)

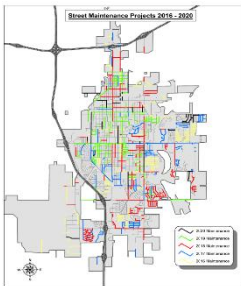
1,140

42%



# Continuous Process Improvement

## 2017 Plan (Presented)



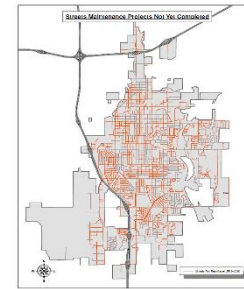
New pavement mgmt.  
analysis beginning  
August, 2021

*Asphalt Streets and APC*

## Base Guidance & Assumptions

- Account for all segments
- Validate intervals
- Reduce exposed crack seal
- Provide \$ predictability
- Determine actual need
- 8% Increase over 2021

## 2022 Plan (Recommended)




# Pavement Management Plan Comparison

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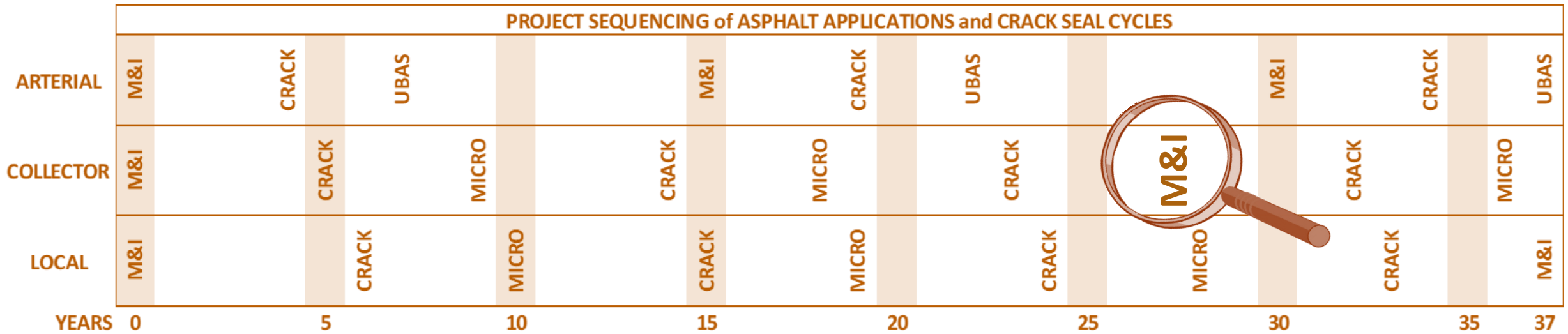
## 2017 PLAN (PRESENTED)

- Arterial: 12 years
- Collector: 24 years
- Local: 34 years
  
- Plan has generally worked well (annually)
- Many people recognize City's emphasis on improved streets since 2017
- Underwent a number of changes in past several years

## 2022 PLAN (RECOMMENDED)

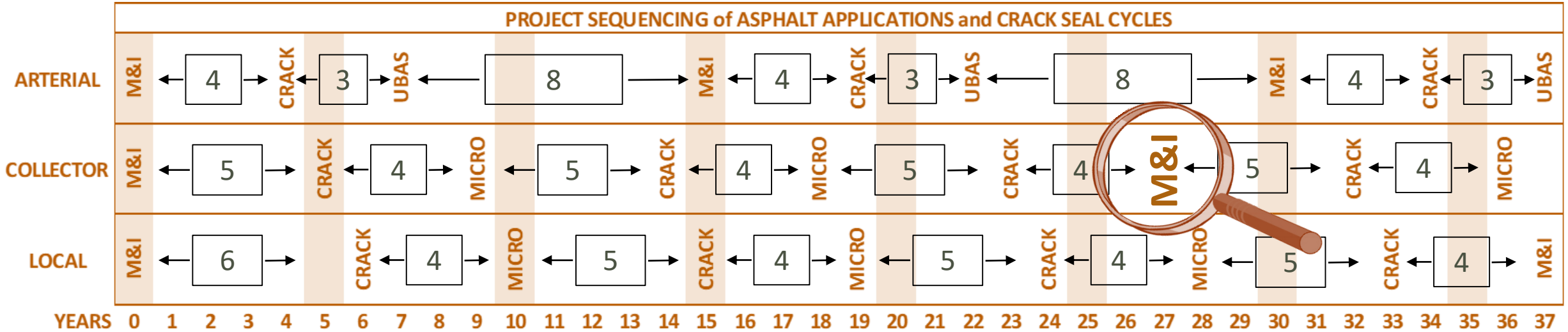
- Arterial: 15 years
  - Collector: 27 years
  - Local: 37 years
  
  - Provides 12-year budget forecasting
  - Improves annual funding balance and predictability
  - Reduces touches over time and amount of exposed crack seal (on arterials)
- 

# Application & Crack Seal Cycle



A cycle represents the number of years from one Mill & Inlay (M&I) to the next.

# Application & Crack Seal Cycle



## Arterial: 15-year Cycle

M&I: 4 YR	Crack: 3 YR	UBAS: 8 YR
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## Collector: 27-year Cycle

M&I: 5 YR	Crack: 4 YR	Micro/Chip: 5 YR	Crack: 4 YR	Micro/Chip: 5 YR	Crack: 4 YR
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## Local: 37-year Cycle

M&I: 6 YR	Crack: 4 YR	Micro/Chip: 5 YR	Crack: 4 YR	Micro/Chip: 5 YR	Crack: 4 YR	Micro/Chip: 5 YR	Crack: 4 YR
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# 2022 Plan Summary

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- ✓ Provides 12-year predictability with asphalt expenditures of ~\$3.2M using 2021 pricing
- ✓ Accounts for all 1,795 asphalt road segments
- ✓ Enables inclusion of additional segments over time (new development)
- ✓ Able to consider transition from Excel spreadsheet to PAVER or other software
- ✓ Includes continued use of Ultra-thin Bonded Asphalt Surface (UBAS) where applicable (incl. concrete streets)
- ✓ Adds fog seal on chip sealed streets
- ✓ Eliminates use of chip seal on high traffic roads (i.e. Markley Road)
- ✓ Continues to provide crack seal prior to chip seal on collectors & locals and prior to UBAS on arterials

Description	Amount
Arterials	+ \$69,000.00
Collector Streets	- \$41,912.00
Local Streets	-\$152,222.00
<b>Total Annual Cost Avoidance</b>	<b>\$125,134.00</b>

Capital Fund

\$125,134.00 x 12 years = \$1,501,488!

# Annual Project Planning: 2023 - 2035

## ASPHALT PLANNING CONSIDERATIONS

### All Asphalt Segments (1,795)

- ✓ Totaled by square yards and unit pricing
- ✓ 12-Year Planning Period (2023-2035)
- ✓ Arterials, Collectors, & Locals

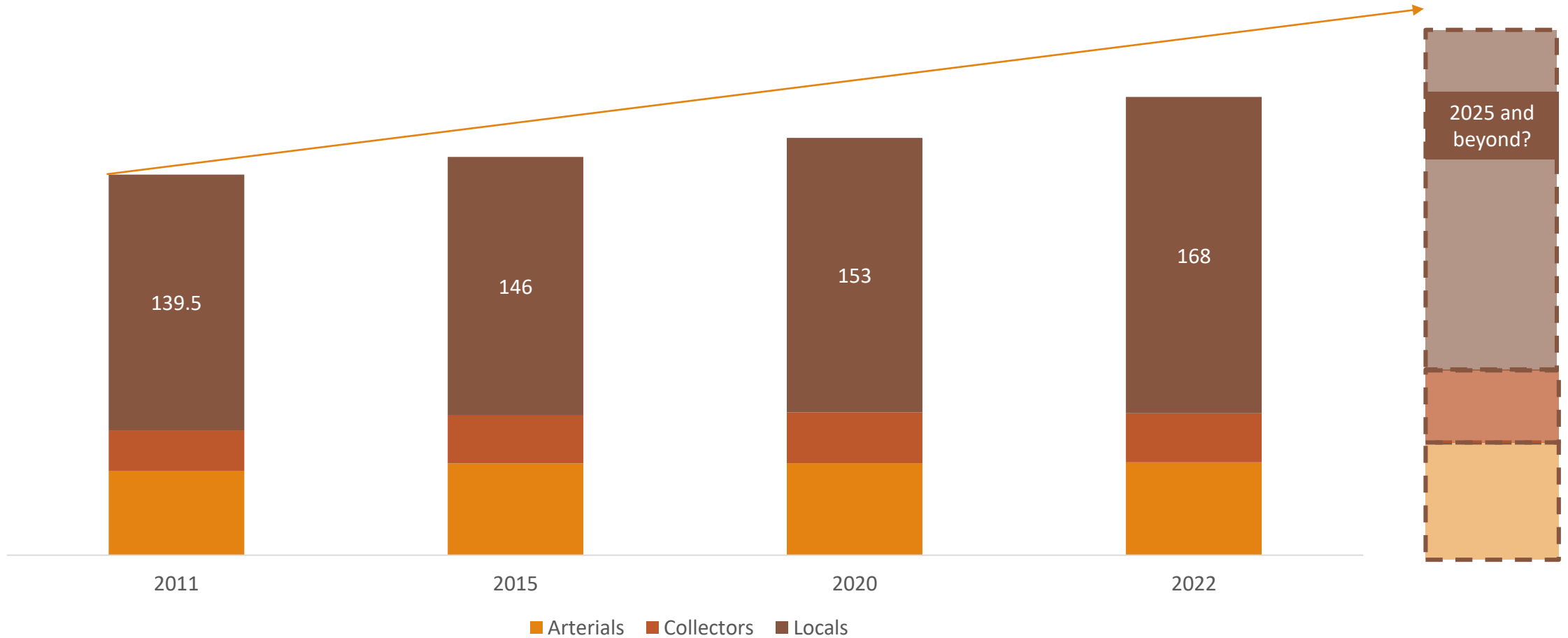
### Initial calculation at 8% above 2021

- ✓ Current average \$3.22 M (before inflation)
- ✓ Adjusted average using 2022 pricing
- ✓ Future annual inflationary adjustment of 2%\*

## ACTUAL 2022 BIDS ABOVE 2021 VALUES

Description	2017-2021	2021-2022
Crack seal	+3 %	+8 %
Chip Seal	+9 %	+21 %
Microsurfacing	+1 %	+23 %
UBAS	+8 %	+25 %
Mill & Inlay	+6 %	+ 31 %
<i>Average 2017-2021 increase (5%)</i>		
<i>Average 2021-2022 increase (21%)</i>		
<i>Average annual projects = \$3.81 M*</i>		

# Centerline Miles



# Additional Funding Requirements (2022)

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- ✓ Magnolia Road traffic study
- ✓ Cedar Ridge Drive pavement extension
- ✓ Broadway Boulevard medians
- ✓ Winn Road culvert
- ✓ W. Magnolia Road design
- ✓ Holmes Road design
- ✓ New housing developments
- ✓ Other



# Pavement Management Financial Data

Year→	Description	2017	2018	2019	2020	2021	2022
Item↓							
GT 1	Schwan's Economic Development	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 900,000
GT 2	Streets - Stormwater, Bridges, RR, Parking	\$ 689,243	\$ 739,243	\$ 774,243	\$ 949,243	\$ 774,243	\$ 529,243
GT 4	Sidewalks and Ramps	\$ 115,000	\$ 90,000	\$ 80,000	\$ 90,000	\$ 90,000	\$ 290,000
GT 5	Traffic Maint., Markings & Detection	\$ 142,000	\$ 117,000	\$ 92,000	\$ 142,000	\$ 142,000	\$ 187,000
Subtotal	Gas Tax	\$ 946,243	\$ 946,243	\$ 946,243	\$ 1,181,243	\$ 1,006,243	\$ 1,906,243
STPW1	M&I, UBAS, Micro and Chip Seal	\$ 3,070,000	\$ 3,125,000	\$ 3,100,000	\$ 2,600,000	\$ 2,600,000	\$ 2,650,000
STPW2	Major & Minor Concrete Repair	\$ 630,000	\$ 575,000	\$ 600,000	\$ 600,000	\$ 600,000	\$ 550,000
Subtotal	Sales Tax - Capital Reserve Fund 753	\$ 3,700,000	\$ 3,700,000	\$ 3,700,000	\$ 3,200,000	\$ 3,200,000	\$ 3,200,000
FFE1	Federal Funds Exchange	\$ 494,337	\$ 423,318	\$ 488,755	\$ 897,239	\$ 584,643	\$ 595,783
Subtotal	KDOT Federal Funds Exchange	\$ 494,337	\$ 423,318	\$ 488,755	\$ 897,239	\$ 584,643	\$ 595,783
<b>Total</b>		<b>\$ 5,140,580</b>	<b>\$ 5,069,561</b>	<b>\$ 5,134,998</b>	<b>\$ 5,278,482</b>	<b>\$ 4,790,886</b>	<b>\$ 5,702,026</b>

*In 2019, the street maintenance fund from sales tax was \$3.7 M. In 2020, this was reduced to \$3.2 M.*

# Pavement Management System Balance

## \$1.97M Non-asphalt Requirements

- ✓ Stormwater, Bridges, RR, Parking (\$450K)
- ✓ Sidewalks and Ramps (\$150K)
- ✓ TC Maint, Markings & Detection (\$190K)
- ✓ Major and Minor Concrete (\$600K)
- ✓ FFE Projects (\$580K)

2017-2022 Avg. Total Funding	\$5.19M
<u>Average Total - Asphalt</u>	<u>\$3.22M</u>
Remainder	\$1.97M



*This slide shows staff would be able to provide complete pavement management services at current funding averages for the 2023-2035 analysis period if prices remained at or near 2021 prices plus 8% inflation .*

# Pavement Management System Deficit

## \$1.97M Non-asphalt Requirements

- ✓ Stormwater, Bridges, RR, Parking (\$450K)
- ✓ Sidewalks and Ramps (\$150K)
- ✓ TC Maint, Markings & Detection (\$190K)
- ✓ Major and Minor Concrete (\$600K)
- ✓ FFE Projects (\$580K)

2017-2022 Avg. Total Funding	\$5.19M
<u>Average Total - Asphalt</u>	<u>\$3.81M</u>
Remainder	\$1.38M



# 5-YR Asphalt Costs with Annual Inflation

Description	2023	2024	2025	2026	2027	Average
2021 plus 8%	\$ 2,784,160	\$ 2,670,063	\$ 3,098,032	\$ 3,246,995	\$ 3,336,127	\$ 3,027,075
2022 Actual	\$ 3,270,059	\$ 3,046,548	\$ 3,879,731	\$ 3,640,401	\$ 4,211,291	\$ 3,609,606
2022 plus 2%	\$ 3,335,461	\$ 3,168,409	\$ 4,112,515	\$ 3,931,633	\$ 4,632,420	\$ 3,836,088
2022 plus 4%	\$ 3,400,861	\$ 3,290,272	\$ 4,345,299	\$ 4,222,865	\$ 5,053,549	\$ 4,062,569





Item	Fund	Dept. /Div.	Description	2023	2024	2025	2026	2027
GT2	Gas Tax	PW/EN	Streets (Crack Seal, Stormwater, Bridges, Railroad, Parking Lots)	\$ 777,000	\$ 658,000	\$ 663,000	\$ 662,000	\$ 754,000
GT4	Gas Tax	PW/EN	Sidewalks and Ramps	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000	\$ 150,000
GT5	Gas Tax	PW/EN	Traffic Control (Maintenance, Markings and Detection	\$ 190,000	\$ 190,000	\$ 190,000	\$ 190,000	\$ 190,000
Budget	Gas Tax	PW/EN	Sub-total	\$ 1,117,000	\$ 998,000	\$ 1,003,000	\$ 1,002,000	\$ 1,094,000
STPW1	Sales Tax	PW/EN	Streets Asphaltic Surface Treatments (M&I, UBAS, Microsurface, Chip Seal)	\$ 2,933,000	\$ 2,817,000	\$ 3,762,000	\$ 3,587,000	\$ 4,202,000
STPW2	Sales Tax	PW/EN	Concrete (Major Replacement, Minor Repair)	\$ 600,000	\$ 600,000	\$ 600,000	\$ 600,000	\$ 600,000
Budget	Sales Tax	PW/EN	Sub-total	\$ 3,533,000	\$ 3,417,000	\$ 4,362,000	\$ 4,187,000	\$ 4,802,000
FFE1	FFE	PW/EN	Federal Fund Exchange	\$ 580,000	\$ 580,000	\$ 580,000	\$ 580,000	\$ 580,000
Budget	FFE	PW/EN	Sub-total	\$ 580,000	\$ 580,000	\$ 580,000	\$ 580,000	\$ 580,000
Total Budget (not including debt financing)				\$ 5,230,000	\$ 4,995,000	\$ 5,945,000	\$ 5,769,000	\$ 6,476,000
Revenue				\$ 5,380,000	\$ 5,396,000	\$ 5,412,000	\$ 5,428,000	\$ 5,444,000
<b>Difference (Over)/Under (Revenue minus total budget; assumes 1% increase in GT revenue annually)</b>				<b>\$ 150,000</b>	<b>\$ 401,000</b>	<b>\$ (533,000)</b>	<b>\$ (341,000)</b>	<b>\$ (1,032,000)</b>



Average 12-year deficit + ~\$580K

# Options

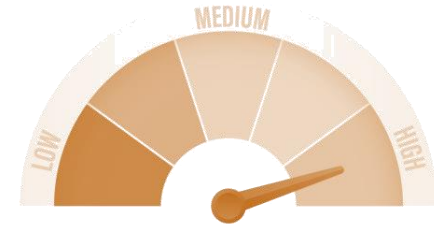
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- ✓ Increase budget to account for rising costs (inflation) and additional funding requirements, such as new developments, County road annexation or acquiring additional private roads
  - i.e. Capture portion of tax revenue growth specifically for pavement management
- ✓ Use FFE to help offset funding gap - temporary; means other projects won't be done
- ✓ Reduce service levels
  - i.e. Reconsider greater use of chip seal (not recommended)
- ✓ Eliminate select services
- ✓ Consider alternative approaches for cost saving opportunities (new applications)



# Risks

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- ✓ Continued rise in the cost of asphalt applications
- ✓ Less work able to be performed
- ✓ Shortening of pavement lifecycles
- ✓ Deterioration of pavement
- ✓ Return to lower pavement condition levels
- ✓ Decreased citizen satisfaction (increased complaints)
- ✓ Inability to properly maintain streets as new segments are added to the system

# Summary

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- ✓ 2022 Pavement Management Plan:
  - Plan reduced/avoided \$1.5M in expenses over 12-year window
  - Accounts for all asphalt/APC segments (1,795)
  - Establishes & validates revised intervals (15, 27 and 37 years)
  - Reduces exposed crack seal on arterial streets
  - Provides improved financial predictability
  - Determines actual need with assumed +2% inflation rate
- ✓ We have addressed asphalt applications and are now moving on to analyze other categories of street work:
  - Major and minor concrete
  - Bridge maintenance
  - Culvert repair and replacement
  - Sidewalks and ramps
  - City-owned/downtown parking lot repairs
- ✓ Since the sales tax increase was factored into our annual budget, the overall street budget was increased by approximately \$2M; cut in 2020 by \$500K



# Recommendations and Questions

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## ✓ Recommendations:

- In order to sustain the plan, the annual budget is going to have to keep up with the rate of inflation in street costs
- Total budget averages an annual deficit of about \$580K over 12-year planning window
- FFE can be used to help cover the total budget deficit for next few years
  - Capture a portion of tax revenue growth specifically for pavement management each year
  - Continue ongoing staff effort to evaluate alternative pavement applications to reduce costs
  - Begin long-term planning and financial strategy for remaining concrete segments and other categories
  - Hold a “State of the Streets” pavement management study session at end of annual bidding & beginning of budget preparation each year

## ✓ Questions?

