2021 Pavement Management Program Recommendations

Overview

- Purpose and Need
- Principles
- Maintenance Types
- Process
- Condition Ranges
- Type/Condition
- Methodology
- Recommendations
- Funding
- Next Steps

Purpose and Need

- To preserve and extend the useful life of paved surfaces throughout the City and optimize the available funds to meet the roadway network condition needs.
  - Maximize performance and safety standards of City roadways
  - Minimize overall long-term costs of managing the network roadway system

Principles

- Repairing streets when still in fair condition ultimately costs less over their lifetime than waiting until they have fallen in poor condition.

Figure 1-1 - Pavement Life Cycle Curve

- Delaying until the road is in “Fair” condition or worse, the cost of rehabilitation becomes 4 to 5 times more expensive than for those roads in “Good” condition.

Maintenance Types

Routine:

- Planned; cyclical
- Reactive to problems; performed after a deficiency occurs in the pavement
- Does not extend service life

Examples:

- Crack sealing/filling
- Full depth crack repair with mastic material
- Joint sealing (concrete)
- Pothole patching
- Leveling low spots

Maintenance Types

Preventive:

- Performed to protect the existing pavement through surface treatments
- Extends the service life
- Does not add any structural strength
- Proactive/applied to pavements in good condition

Examples:

- Slurry Seal
- Chip Seal
- Microsurfacing

Maintenance Types

Corrective:

- Reactive
- Extends the service life through structural enhancements
- Performed when deficiencies are so significant that preventive maintenance no longer is effective
- More extensive and more expensive

Examples:

- Mill and Overlay (Resurfacing)
- Full Depth Reclamation
- Hot mix overlay (with or without leveling course)

Process

Figure 1-2 - The Pavement Management Process

- System Configuration – Identify all roadways, their physical characteristics (length, width, etc.), pavement type, and road classification – link to GIS map.

- Data Collection/Field Survey – Condition is assessed based on surface distress (such as cracking, potholes, raveling, etc.) as well as severity (Low, Moderate, High) and is attached to the appropriate road segment and its count (e.g. number of potholes), square footage (area covered by cracking), and linear feet (length of specific crack) are added.

- Analysis and Reporting – Provide a quantitative performance score (Pavement Condition Index (PCI)) representing the surface condition of the pavement on a scale of 0 to 100 – the higher the score the better the condition of the roadway.

Typical PCI Corrective Ranges

PCI Range	Work Type	Rehabilitation Options
86-100 Good	Routine	Little or no maintenance E.g. Crack Seal, Reclimite, fog seal
71-85 Satisfactory	Preventative	Routine Maintenance E.g. Seals such as slurry seal
56-70 Fair	Preventive Corrective	Non-structural overlay, cape seal, Mill and overlay
41-55 Poor	Corrective	Structural overlay Overlay, Mill and overlay
26-40 Very Poor	Corrective	Structural Overlay Overlay, Mill and overlay
11-25 Serious	Reconstruction	Reconstruction, rebuild, full depth reclamation
0-10 Failed	Reconstruction	Reconstruction, rebuild, full depth reclamation

Type/Condition

- Commerce City has 260.89 miles of paved roads

Distribution of Roads by Pavement Type

Pavement Type	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
Asphalt	2,861	250.73	4,818,180	93%	79
Concrete	54	10.16	381,047	7%	95
Total	2,915	260.89	5,199,228	100%	80

Distribution of Asphalt Roads by Functional Class

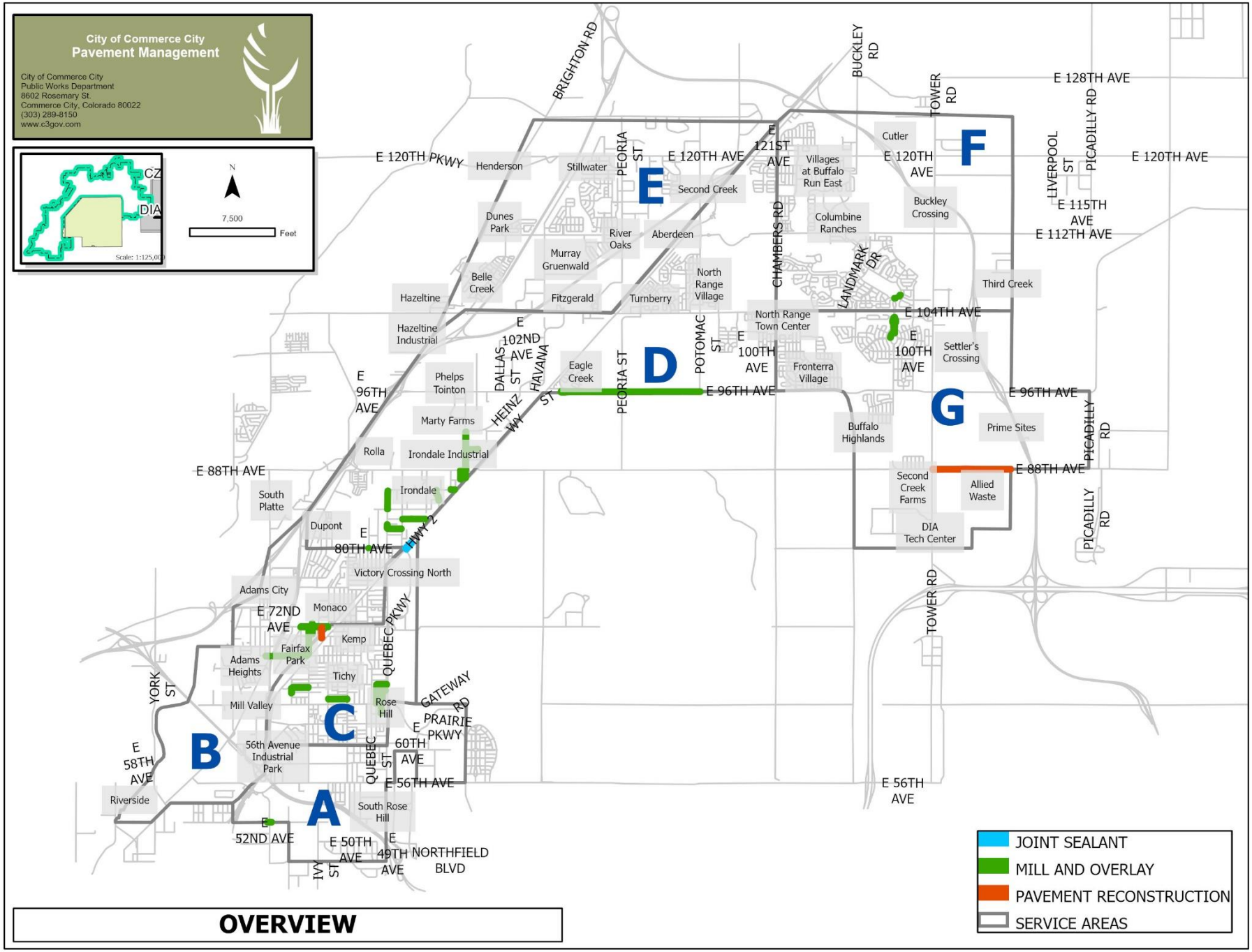
Functional Class/ Paver Designation	# of Sections	# of Miles	# of Square Yards	% by # of Square Yards	Weighted Average PCI
Arterial & Collector/ B & C	759	94.17	2,121,064	44%	78
Local/ E	2,102	156.57	2,697,116	56%	79
Total	**2861**	**250.74**	**4,818,180**	**100%**	**79**

Methodology

- Asphalt roadways were divided into 2,861 sections and then evaluated based on Average PCI, as well as;
  - Current Traffic volumes
  - Roadway Classification
  - Snow routes
  - Proximity to schools, transit, parks, and commercial businesses
  - Economic development potential
  - Coordinated with SAWSD water line replacement schedule
- Several sections eliminated from this program because more extensive work (reconstruction) is needed

Recommendations

- Primary focus on roadways with PCI less than 70
  - Staff added some residential streets with PCI greater than 70
    - Based on citizen concerns and staff observations
    - Example - Southlawn Circle (w/PCI of 81)
- Most work is Mill and Overlay
- Street Reconstruction
  - Includes portions of Jasmine Street, 88th Ave, Reunion Pkwy, 86th Ave, and the intersection of 52nd and Dahlia
- Crack Sealing is completed continuously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JOINT SEALANT
MILL AND OVERLAY
PAVEMENT RECONSTRUCTION
SERVICE AREAS

OVERVIEW

Recommendations

Maintenance Type	Area	Average PCI	Estimated Cost	Fund
Mill and Overlay	Yosemite Street - 87th Ave to 88th Ave	18	$ 14,125	Pavement Management
Mill and Overlay	Yosemite Street - 88th Ave to 90th Ave	26	$ 105,310	Pavement Management
Mill and Overlay	89th Avenue - Yosemite St to end of street	38	$ 42,761	Pavement Management
Mill and Overlay	90th Avenue - Yosemite St to end of street	29	$ 29,313	Pavement Management
Mill and Overlay	82nd Avenue - Quebec St to Rosemary St	70	$ 20,826	Pavement Management
Mill and Overlay	83rd Avenue - Rosemary St to Ulster St	17	$ 30,585	Pavement Management
Mill and Overlay	87th Avenue - Willow St to Xenia St	3	$ 12,357	Pavement Management
Mill and Overlay	Quebec Street - 82nd Ave to 82nd Pl	56	$ 4,474	Pavement Management
Mill and Overlay	Quebec Street - 84th Ave to 86th Ave	52	$ 26,057	Pavement Management

Recommendations

Maintenance Type	Area	Average PCI	Estimated Cost	Fund
Mill and Overlay	Valentia Street - 85th Ave to 86th Ave	67	$ 21,412	Pavement Management
Mill and Overlay	Xenia Street - 87th Ave to 88th Ave	14	$ 15,252	Pavement Management
Mill and Overlay	Holly Street - 69th Ave to end of street	65	$ 30,449	Pavement Management
Mill and Overlay	64th Place - Kearney St to Monaco St	79	$ 36,773	Pavement Management
Mill and Overlay	64th Place - Porter Way to Poplar St	76	$ 8,731	Pavement Management
Mill and Overlay	65th Place - Porter Way to Quebec St	74	$ 14,982	Pavement Management
Mill and Overlay	66th Avenue - Pontiac St to Quebec St	68	$ 15,107	Pavement Management
Mill and Overlay	66th Way - Glencoe St to Holly St	65	$ 45,384	Pavement Management
Mill and Overlay	69th Avenue - Dahlia St to Holly St	71	$ 65,707	Pavement Management
Mill and Overlay	Glencoe Street - 65th Way to 66th Way	75	$ 14,530	Pavement Management

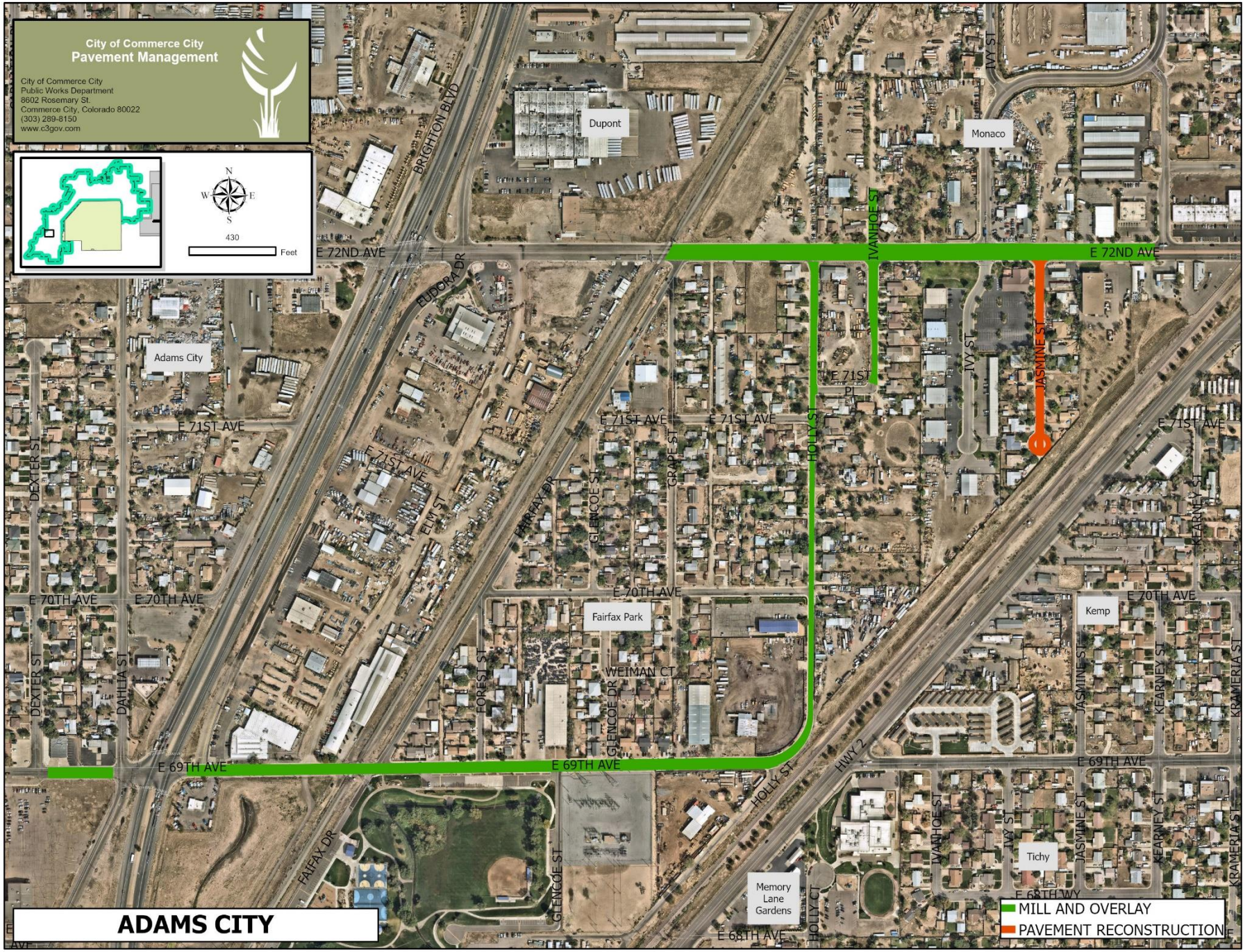
Recommendations

Maintenance Type	Area	Average PCI	Estimated Cost	Fund
Mill and Overlay	Ivanhoe Street - 71st Place to end of street	61	$ 18,716	Pavement Management
Mill and Overlay	Pontiac Street - 64th Ave to 66th Ave	55	$ 43,005	Pavement Management
Mill and Overlay	Poplar Street - 63rd Ave to 66th Ave	70	$ 49,427	Pavement Management
Mill and Overlay	Porter Way - 64th Ave to 66th Ave	59	$ 41,318	Pavement Management
Mill and Overlay	72nd Avenue - Fairfax Dr to Kearney St	57	$ 118,788	Pavement Management
Street Reconstruction	Jasmine Street - 72nd Avenue south to end of cul-de-sac	2	$ 200,305	Street Reconstruction
*Sidewalk Connectivity	Jasmine Street - 72nd Avenue south to end of cul-de-sac	N/A	$ 95,079	Street Reconstruction
Street Reconstruction	88th Avenue - Tower Road to Himalaya Street	45	$ 146,251	Street Reconstruction
Mill and Overlay	49th Avenue - Pontiac St to Sand Creek Dr	50	$ 1,727	Pavement Management
Mill and Overlay	96th Avenue - Eagle Creek Pkwy to Potomac	45	$ 275,585	Pavement Management

*NOTE - Add Jasmine Street Sidewalk to Street Reconstruction Budget

Recommendations

Maintenance Type	Area	Average PCI	Estimated Cost	Fund
Street Reconstruction	Reunion Parkway - 103rd Ave to Southlawn Pkwy	43	$ 36,962	Street Reconstruction
Mill and Overlay	Southlawn Circle - Reunion Pkwy to Southlawn Pkwy	81	$ 17,689	Pavement Management
Street Reconstruction	52nd Avenue and Dahlia Street intersection	45	$ 34,112	Pavement Management
Street Reconstruction	86th Avenue - Ulster St to Willow	25	$ 247,000	Pavement Management
		Subtotal	$ 1,880,099	
		Mobilization (5%)	$ 94,005	
		Traffic Control (5%)	$ 94,005	
		Design (8%)	$ 150,408	
		Contingency (20%)	$ 376,020	
		Total =	$ 2,594,537	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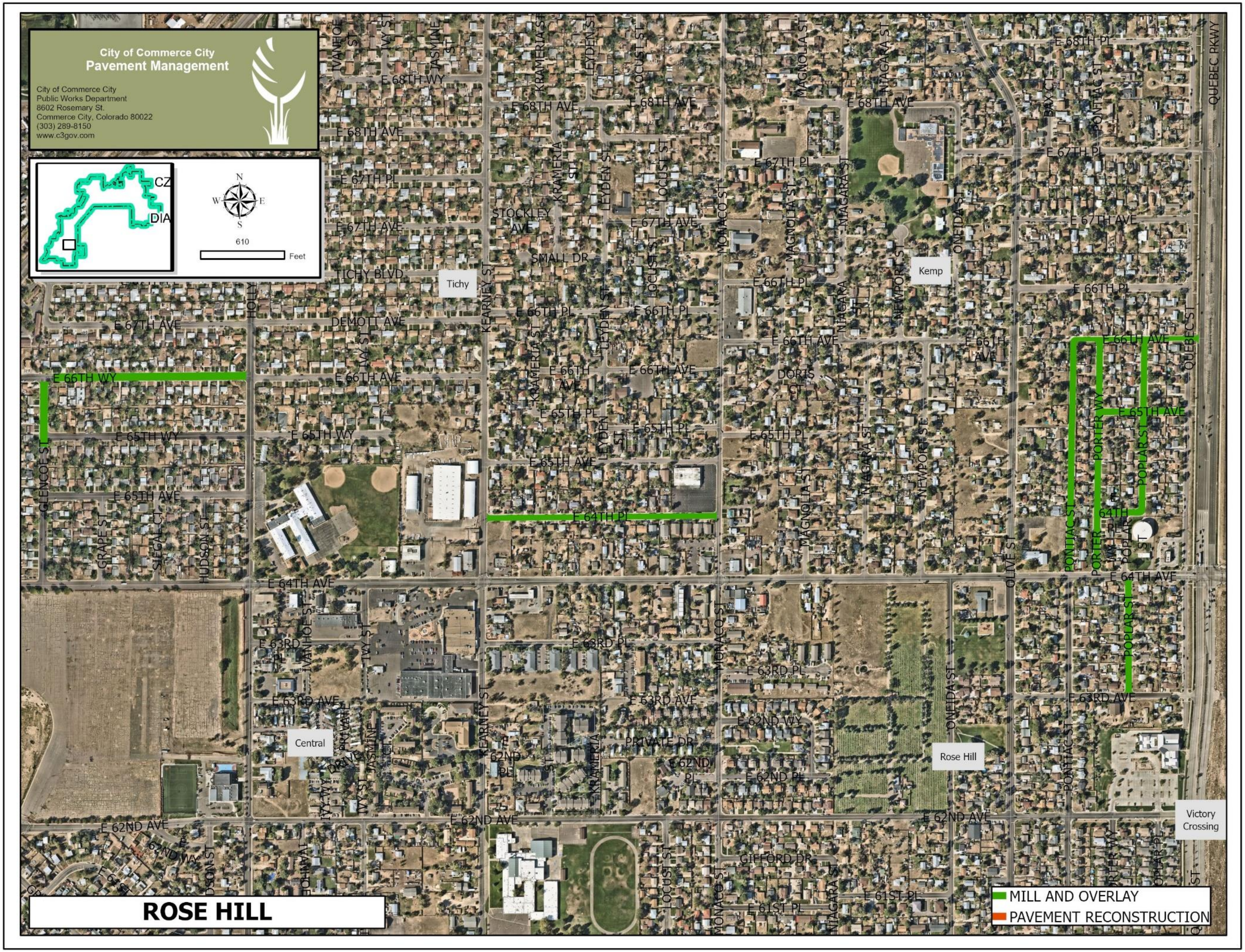
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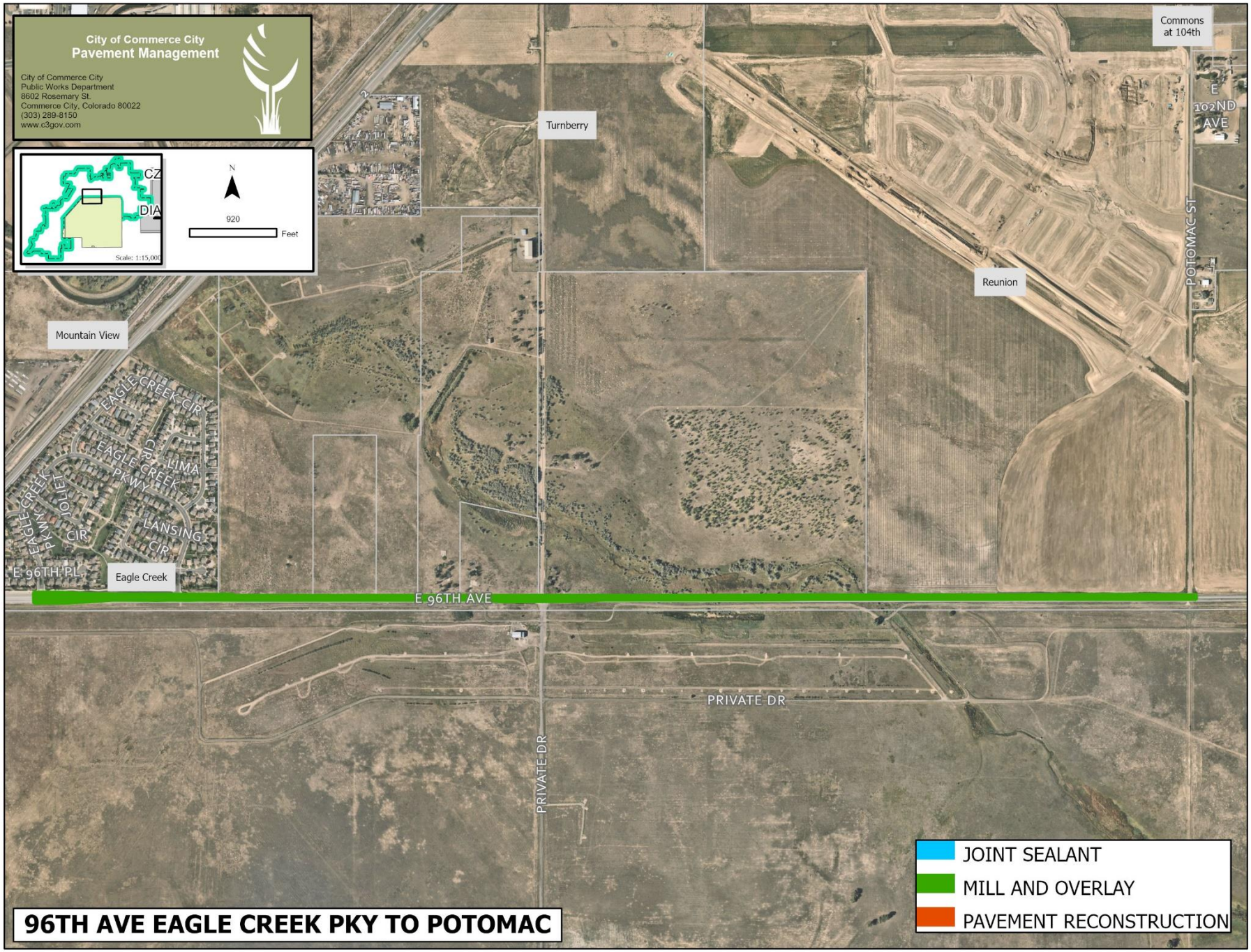
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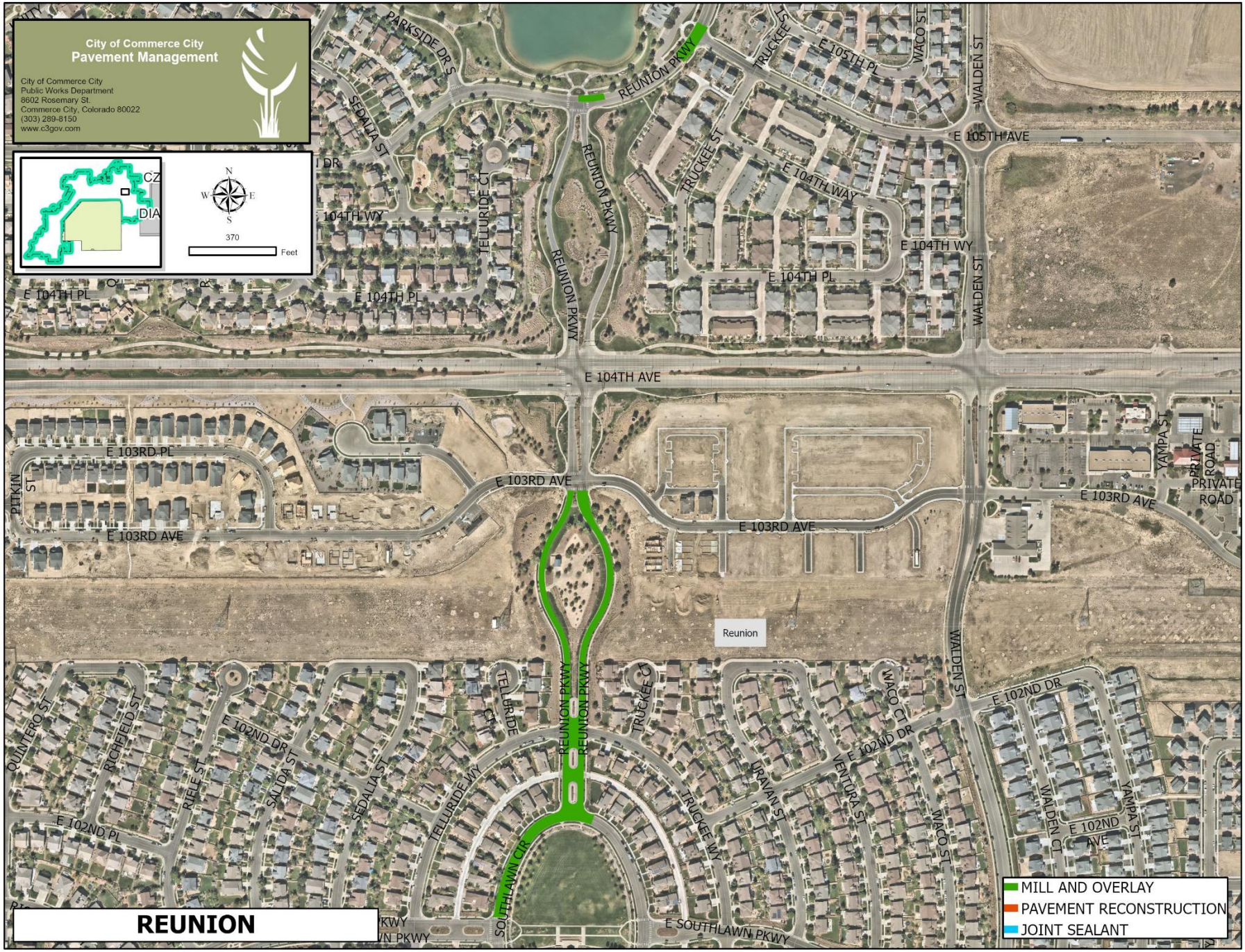
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88TH AVENUE

Recommendations (Crack Repairs)

Maintenance Type	Area	Unit	Unit Price	Cost
Crack Repair (Patching)	1,500	SY	$150.00	$225,000.00

- Propose Crack Repairs Versus Slurry Seal Within Northern Range
  - Focus on repairing large cracks within Reunion Subdivision north and south of 104th Avenue
- Old pavement design was full depth asphalt over natural subgrade
  - Relatively stiff asphalt over flexible natural ground causing cracking
- Recommend newer developments to use composite section
  - Composite section is asphalt and base course over natural surface
  - Base course acts as an intermediate layer between relatively stiff asphalt section and more flexible natural ground
  - Should reduce number of cracks within our newer subdivisions

Funding

Improvement Type	Estimate Cost ($)	Note
Mill and Overlay	$1,546,138	Includes Traffic Control, Mobilization and Contingency
Street Reconstruction	$1,048,398	Includes Traffic Control, Mobilization and Contingency
Crack Repair	$225,000	Includes Traffic Control, Mobilization and Contingency
Total	$2,819,537	

Available Funding Sources

- 2021 Pavement Management Budget $2,000,000
- 2020 Pavement Management Budget Carryover $ 367,204
- 2021 Street Reconstruction Budget $ 500,000
- Total Budget $2,867,204

Next Steps

- Extend current contract w/Elite Surfacing Inc.
- Award Contract April 2021
- Begin Work May 2021

Commerce CITY

Questions?