CITY OF WICHITA

2013

Proposed 2013 Contracted Maintenance Program

Public Works & Utilities

Maintenance Division

December 2012

Introduction:

The City of Wichita's paved street network is comprised of more than 5,000 lane-miles of residential, collector and arterial streets and expressways, representing a total paved area in excess of 322 million square feet. In order to cost effectively maintain this vast network of assets, the City supplements the critical preventive, corrective and emergency maintenance efforts of its internal staff, by leveraging the resources and expertise of private contractors. Each year, contracted pavement maintenance efforts are proposed, and submitted for approval, in the Contracted (Pavement) Maintenance Program (CMP). In order to effectively manage both internal and external pavement maintenance resources, the Public Works & Utilities Department has always striven to effect "the right treatment, on the right road, at the right time". However, just as socioeconomic and technological influences have evolved over the years, so too must our approach. Consequently, the department is in the midst of developing a project selection, evaluation and reporting process that is intended to be:

1. More data driven, and less reliant on individual experience
2. More objective, relying greater on economic measures like return on investment (ROI) and remaining service life (RSL), and less on subjective measures like "good", "satisfactory", "poor", and the like
3. More supportive of experimentation and the incorporation of new technologies, and less adherent to past practice
4. Better able to quantify the cost of deferred maintenance
5. Better able to maximize the City's returns on future investments
6. Better able to assist in the identification of optimum funding levels

The department anticipates that this enhanced "Pavement Management System" will be fully implemented in 2015. Several components already underway in 2012 are being continued, and expanded on, in 2013. Consequently, the proposed 2013 Contracted Maintenance Program represents a blend of both the traditional and enhanced approaches, as follows.

Contracted Maintenance Program (CMP) Project Selection Process

Traditional Approach

Locations to be addressed in the CMP have traditionally been determined using the following criteria:

1. **Pavement Condition Index (PCI)**
   Historically, every street segment in the City is reviewed and assigned a PCI number. The PCI number is determined by evaluating each segment for various pavement distresses. The PCI ranges from 0 to 100, with a value of 70 being presumed to be satisfactory. Streets with PCIs below 70, and especially below 50, have formally been considered first for inclusion in the CMP. PCIs have also been used to guide preventive maintenance, as funding allowed.

(Preventive maintenance delays streets from dropping into a lower condition range and, as a result, requiring much more expensive repairs.)

2. Completion of locations previously identified

If repairs to previously programmed locations are not able to be completed, they are typically included in the following year's CMP.

3. Complaints and Requests

Complaints and requests concerning existing street conditions (from citizens, City officials, and maintenance personnel) are addressed either in-house, or through the CMP. Locations of concern are continually evaluated against other, scheduled projects, and included when warranted.

4. Maintenance history and other, scheduled projects

If a particular street has required continued maintenance from City staff, or routine maintenance operations are no longer effective, it is considered for inclusion in the CMP. Streets that are scheduled to be repaired in other programs, such as the Capital Improvement Program (CIP), are not included in the CMP.

Once the CMP funding level is established, the program is developed. Expenses not considered to benefit any single district (inspection costs, bridge work, bike paths, etc.) are deducted first. Using the criteria above, the remaining funds are applied equally to each of the City's six districts.

2013 Enhanced Approach

As part of ongoing efforts to maximize the City's return on continued investments, several new concepts are proposed anew, or for continued exploration, in 2013.

1. Increased Preventive Maintenance

While preventive maintenance has historically been programmed as funding allows; it is apparent that, in order to ensure maximum return on investment, preventive maintenance must be made a priority. Much like maintaining a functional roof over one's home, the cost to maintain a good road, in good condition, is far less than the cost to rehabilitate a failed one. For example, a preservative seal can extend the service life of a good pavement by approximately 5 years, at a cost around $1/sy, whereas milling and overlaying a bad pavement may extend the service life just 8-12 years, at a cost of $10-$15/sy. When applied to a hypothetical, quarter mile section of 4-lane arterial roadway (1 lane mile) the total cost to preservative seal the section at $1/sy would be $7,040. The total cost to mill and overlay the same section of roadway (7,040 sy) at a later date, assuming a midrange unit cost of $12/sy, would be $84,480. Assuming service lives of 5 and 10 years, respectively, one finds that it costs just $1,408 to add one full lane-mile-year of service life by preservative sealing, while the cost to

add the same one lane-mile-year of service life via mill and overlay is eight times higher, at $8,448.

When one considers, again, that the City's paved street network consists of roughly 5,000 lane-miles of pavement, the financial prudence of preventive maintenance is clear. While we do not presently track overall network condition in terms of remaining service life, we know that each lane-mile has but a limited number of years remaining until the end of its useful service life. Thus, in the absence of any maintenance improvements over a one year period, we can surmise that the remaining service of each lane-mile will be reduced by one year. Applied across the entire network, this represents a total service life reduction of 5,000 lane-mile-years, each year. Pavement preservation treatments, as well as rehabilitative repairs and reconstruction, however, add service life to the network. In order to offset the annual loss, the City must add at least 5,000 lane-mile-years back to the system through its maintenance efforts each year. Any less, results in an overall decline of the network's condition. Any more, and the overall condition improves.

While the City employs numerous strategies in its approach to pavement management, for the purpose of example, we'll examine a simplified approach using four common treatments, including the two previously described, in the table below.

Treatment	Type	Approx. Cost/SY	Approx. Service Life Extension (Years)	Lane-mile-years Needed to Maintain Status Quo	Lane Miles to be treated	Cost to Maintain Status Quo (Using prescribed treatment alone)
Rejuvenating Seal	Preventive	$1	5	5000	1000	$7,040,000
Micro Surfacing	Preventive	$3	6	5000	833	$17,592,960
Mill & Overlay	Rehabilitation	$12	10	5000	500	$42,240,000
Asphalt Reconstruction	Reconstruction	$35	25	5000	200	$49,280,000

While none of the above hypothetical approaches is necessarily optimized for the City's existing network, the exercise serves to illustrate two points. First, to successfully operate under the best of these scenarios – the one that serves to maximize ROI – one would need to begin with a near perfect system and repair 20% of that system each year. In reality, only about 20% of our existing system falls within the appropriate condition range for that treatment (and not all of those are asphalt pavements). Consequently, we must endeavor to employ some optimum combination of treatments across the full spectrum of pavement condition. Second, the example serves to demonstrate the scale of maintenance required, and alludes to the cumulative impact of deferred maintenance.

In light of its benefit, a marked increase in preventive maintenance expenditures was approved in 2012, and is proposed again for 2013. As demonstrated in the following table, proposed 2013 expenditures represent an 81% increase over last year's preventive maintenance spending level.

Preventive Maintenance Expenditures

Year	Project	Expenditure	Lane Miles
2011	Micro Surfacing Seal	$322,000	9.76
	Preservative Seal	$90,000	13.08
	Total	**$412,000**	**22.84**
2012	Micro Surfacing Seal	$1,691,000	37.98
	Preservative Seal	$122,000	54.89
	Total	**$1,813,000**	**54.89**
2013	Cape Seal	$1,056,000	24.51
	Micro Surfacing Seal	$1,005,000	28.78
	Preservative Seal	$595,000	79.49
	Slurry Seal	$461,000	21.15
	Ecopave Surface Seal	$164,000	6.28
	Total	**$3,281,000**	**160.21**

2. Pavement Condition Rating Standardization and Pavement Life Cycle Cost Analysis

The Public Works & Utilities Maintenance Division has historically performed pavement condition assessment in general accordance with the methodology prescribed by the authors of its first Pavement Management System (PMS), which was purchased approximately 20 years ago. Since that time, however, the adoption of a new PMS (Lucity), turnover in the pavement condition assessment position, and efforts to make the resulting Pavement Condition Index more relatable, have resulted in a system more or less unique to the City of Wichita. While research suggests that such variation is common throughout the pavement maintenance industry, several standardized approaches are gaining acceptance, and offer the benefit of enhanced comparability among separate jurisdictions.

Further, ongoing economic pressures have proved the usefulness of the City's traditional Pavement Condition Index (PCI) somewhat limited. While the PCI does serve to effectively illustrate network trends (better or worse), it does not, in and of itself, afford an objective means of characterizing streets as "failed", "deficient", "in need of repair", or the like. Perhaps more importantly, neither does it afford an objective means of quantifying the cost of deferred maintenance. In order that we may accurately and objectively do so, an approach other than PCI is needed.

For the purpose of maximizing ongoing investments, the Public Works & Utilities Department believes it will be better served by evaluating economic measures, rather than PCI alone. By

modeling return on investment (ROI), network needs may be identified objectively, in terms of maximum ROI, rather than based on a certain level of PCI. To be truly effective, however, the data within the model must be thorough, accurate, and reliably measured.

As such, the department issued a Request for Proposal on Pavement Condition Survey, Assessment, and Inventory Services, and awarded the project to the team of Baughman Co., P.A., and MT Consulting in the fall of 2012. The project, anticipated to conclude in the spring of 2013, will accomplish the development and implementation of a standardized, reproducible pavement condition rating methodology, based largely on remaining service life. The project will also produce preliminary, predictive deterioration curves, based on both historical and newly acquired data. These predictive deterioration curves will serve as the backbone of future life-cycle modeling efforts.

In concert with ongoing raw data acquisition and analysis in 2013, department staff will seek to develop a pavement life cycle model capable of evaluating alternative strategies over an extended period (40 or more years) and establishing:

1.) The short and long term results of the department's existing strategy and budget,
2.) The strategy and budget required to maintain current condition and asset values,
3.) The strategy and budget that results in the optimum ROI.

Whether or not the department's existing software is fully capable of producing the desired results is not yet clear. As such, funds are proposed for inclusion in the 2013 CMP in the event that a middleware program is ultimately required.

Knowing that those streets rated in 2012 (using the newly developed methodology) will ideally be rated again in 2013, and annually thereafter, funds are also proposed in order to either contract again for the service, hire additional internal resources sufficient to manually accomplish the task, or purchase an automated data collection solution sufficient to accomplish the task using existing staff. As part of their larger, pavement rating standardization project, the Baughman/MT Consulting/department staff team will perform a cost-benefit analysis of each of these options, in order to determine the most cost-effective, long-term solution.

3. Pilot Projects

Several experimental (pilot) projects were conducted in 2012, in order to test the viability and acceptance of potentially cost effective alternative maintenance techniques. The pilot projects varied, from the use of nontraditional (to the City of Wichita), but industry endorsed treatments, to the use of longstanding treatments on different types of roads. Based on preliminary findings, the use of micro surfacing as a mitigative treatment, in lieu of more costly repair, appears among the most promising of these techniques. However, it and other piloted techniques will continue to be evaluated and incorporated into future preservation programs, as merited.

In the interest of aggressively pursuing and evaluating additional, potentially cost effective alternative maintenance techniques, the proposed 2013 program consists almost exclusively of pilot projects, as demonstrated below. The extent of experimentation continues to vary widely, from the use of new technologies, like Ecopave surface seal, to the use of higher quality aggregates in traditional treatments, as demonstrated in the following table.

2013 CMP Network Funding/Expenditures Summary

Proposed Project	Method/Technology Piloted	Hypothesis	Budget	Budget Allocation
Concrete Street Repair	Partial-depth Repair	Partial-depth repair, where appropriate, may result in reduced cost and higher ROI	$1,250,000	16.7%
Cape Seal	Cape Seal	May be an economical alternative to Mill & Overlay (higher ROI)	$1,056,000	14.1%
Micro Surfacing Seal	Finer Aggregate Gradation	Finer gradation may result in an improved surface, without sacrificing durability	$1,005,000	13.4%
	Increased Aggregate Durability	A more durable aggregate may result in extended performance and higher ROI		
Preservative Seal	Roller Compaction	Roller compaction will promote increased aggregate incorporation, leading to extended performance and higher ROI	$595,000	7.9%
Asphalt Street (Spot) Repair	Warm-mix Asphalt	Warm-mix asphalt will reduce the City's carbon footprint, and may result in reduced costs and higher ROI	$462,000	6.2%
Slurry Seal	Finer Aggregate Gradation	Finer gradation may result in an improved surface, without sacrificing durability	$461,000	6.1%
	Increased Aggregate Durability	A more durable aggregate may result in extended performance and higher ROI		
Thermal Crack Repair	Interlayer Reinforcement	Alternatives to traditional GlassGrid® interlayer technology may result in improved performance and higher ROI	$239,000	3.2%
Ecopave Surface Seal	Ecopave Surface Seal	May be an economical alternative to slurry seal (higher ROI)	$164,000	2.2%

Following evaluation of the pilot treatments and review of the life cycle modeling results, further enhancements will be made to future contracted maintenance programs.

2013 Contracted Maintenance Program Summary

Definitions

1. **Asphalt Street Repair**
   "Asphalt street repair" includes various asphalt spot repairs, ranging from surface patching to full-depth removal and replacement, undertaken to strategically address myriad pavement distresses, such as block cracking and potholes.

2. **Cape Seal**
   A "cape seal" is a multi-layer surface treatment that consists of the application of an asphalt emulsion chip seal, followed by the application of asphalt emulsion slurry seal. The chip seal serves as a waterproofing membrane, sealing the underlying pavement, while the slurry seal serves to bind the aggregate in place and provide a smooth driving surface.

3. **Chip Seal**
   A "chip seal" is a single surface treatment that consists of a single layer of spray-applied asphalt binder, covered by a single application of aggregate. Its primary purpose is to seal, or waterproof, minor cracking in the underlying pavement.

4. **Concrete Repair**
   "Concrete repair" traditionally includes the strategic full-depth removal and replacement of concrete pavement, in order to address myriad pavement distresses, including spalling and pop-outs.

5. **Ecopave Surface Seal**
   "Ecopave" is a heavy-duty surface designed to seal pavement surfaces with small hairline cracks. It is designed to extend the life of pavements that have not yet deteriorated to the point of requiring a slurry seal.

6. **Micro Surfacing Seal**
   In a "micro surfacing seal", a mixture of relatively large aggregate, polymer modified emulsion, mineral filler and additives are combined and applied to an existing pavement using a specialized mixing and paving machine. The treatment is used to reduce water penetration, correct minor surface irregularities, improve aesthetics and extend the useful life of underlying pavement.

7. **Preservative Seal**
   A "preservative seal" consists of the application of an emulsion specially formulated to penetrate, restore and preserve existing asphalt binders. By keeping the pavement flexible, it serves to seal against water intrusion, inhibit oxidation and improve aggregate retention.

8. Slurry Seal

A "slurry seal" is a basic surface sealing procedure in which a thin layer of fine graded aggregate, asphalt emulsion (as a binder) and mineral fillers is applied to the pavement. Its primary purpose is to retard water penetration, restore moderate to severe aggregate loss, improve aesthetics and extend the service life of the underlying pavement.

9. Thermal Crack Repair

"Thermal crack repair" consists of repairing large cracks in full-depth asphalt pavements by removing the top two inches of pavement and installing a pavement interlayer reinforcement system beneath a new layer of asphalt. The interlayer reinforcement deters the crack from reflecting back through the renewed surface.

Proposed Expenditures

Proposed 2013 contracted pavement maintenance expenditures total $7.5 million. Funds totaling $4.0 million are allocated in the 2012-2013 Adopted Budget for Pavement Maintenance. The remaining $3.5 million are allocated in the 2011-2020 Adopted CIP.

2013 CMP Network Funding/Expenditures Summary

Funding Source/Project	Expenditures	Percentage
General Obligation Funding		
Micro Surfacing Seal	$1,005,000	13.4%
Preservative Seal	$595,000	7.9%
Cape Seal	$513,000	6.8%
Asphalt Street Repair	$462,000	6.2%
Slurry Seal	$461,000	6.1%
Thermal Crack Repair	$239,000	3.2%
Ecopave Surface Seal	$164,000	2.2%
Engineering Salaries & Overhead*	$313,000	4.2%
Contingency*	$248,000	3.3%
CIP Street Improvement Funding		
Concrete Street Repair	$1,250,000	16.7%
Cape Seal	$543,000	7.2%
Pavement Condition Assessment & Life-cycle Model Development (Equipment/Software/Service)*	$1,000,000	13.3%
Engineering Salaries & Overhead*	$207,000	2.8%
CIP Street Rehabilitation Funding		
CIP Arterial Street Repair Funds*	$265,500	3.5%
CIP KLINK Resurfacing Funds ($200,000 KDOT Match)*	$177,000	2.4%
Engineering Salaries & Overhead*	$57,500	0.8%
Total Funding	**$7,500,000**	**100.0%**

*Denotes non-district-specific expenditures

2013 District-specific Construction Expenditures Summary

Project	District					
	1	2	3	4	5	6
Asphalt Street Repair	$32,000	$0	$65,000	$124,000	$0	$241,000
Cape Seal	$167,000	$74,944	$117,200	$183,000	$149,000	$364,856
Concrete Street Repair	$310,000	$158,000	$435,000	$347,000	$0	$0
Ecopave Surface Seal	$0	$50,000	$0	$0	$114,000	$0
Micro Surfacing	$106,000	$230,000	$147,000	$132,000	$226,000	$164,000
Preservative Seal	$53,000	$117,000	$43,000	$56,000	$184,000	$142,000
Slurry Seal	$152,000	$167,000	$0	$0	$142,000	$0
Thermal Crack Repair	$22,000	$126,000	$64,000	$0	$27,000	$0
District Totals*	**$842,000**	**$922,944**	**$871,200**	**$842,000**	**$842,000**	**$911,856**
*2012 Transit Funding Carry-Over Adjustment	-$30,000	$50,944	-$800	-$30,000	-$30,000	$39,856
***District Totals Before Carry-Over Adjustment**	**$872,000**	**$872,000**	**$872,000**	**$872,000**	**$872,000**	**$872,000**

2013 CMP Network Impact Summary

Project	Total Square Yards	Arterial Lane Miles	Residential Lane Miles	Total Lane Miles
Preservative Seal	559,635	17.66	61.83	79.49
Asphalt Street Repair	7,242	13.71	16.78	30.49
Micro Surfacing Seal	202,638	24.48	4.3	28.78
Cape Seal	171,534	22.73	1.78	24.51
Thermal Crack Repair	4,263	9.56	11.68	21.24
Slurry Seal	148,894	2.49	18.66	21.15
Concrete Street Repair	33,276	8.08	10.69	18.77
Ecopave Surface Seal	44,246	0	6.28	6.28
CIP KLINK Resurfacing	37,450	5.32	0.00	5.32
CIP Arterial Street Repair	6,600	3.88	0.00	3.88
Totals	**1,215,778**	**107.91**	**132.00**	**239.91**

Proposed Locations

District I

STREET	FROM	TO	PROJECT
Oliver	25th St N	1750' S of 25th St N	Asphalt Street Repair
21st St	Oliver	Pinecrest	Cape Seal
Hydraulic	Harry	Mt. Vernon	Cape Seal
Ohio	3rd St	Central	Cape Seal
8th St	Cleveland	9th St	Concrete Street Repair
9th St	8th St	Minnesota	Concrete Street Repair
Broadview	8th St	Murdock	Concrete Street Repair
Murdock	Belmont	Roosevelt	Concrete Street Repair
Washington	Southeast Blvd	Kellogg	Concrete Street Repair
Zimmerly	Mead	Washington	Concrete Street Repair
25th St N	Hillside	Minnesota	Micro Surfacing
Ellis	Lincoln	Morris	Micro Surfacing
Lulu	Lincoln	Bayley	Micro Surfacing
Central	Vassar	Oliver	Micro Surfacing
Area of S of Waterman and E of McLean			Preservative Seal
26th St N	Minnesota	Madison	Preservative Seal
Bluff	21st St	24th St	Preservative Seal
Estelle	Lewis	Douglas	Preservative Seal
Lorraine	13th St	17th St	Preservative Seal
Piatt Cir-2701	26th St N	NE Cul-De-Sac	Preservative Seal
Volutsia	Morris	Gilbert	Preservative Seal
Waterman	Wichita	Washington	Preservative Seal
27th St N	Grove	Volutsia	Slurry Seal
Grove	Raleigh	27th St N	Slurry Seal
Hillside	37th St N	45th St N	Slurry Seal
Mosley	Harry	Boston	Slurry Seal
Hillside	Bayley	Harry	Thermal Crack Repair
Oliver	Central	9th St	Thermal Crack Repair

District II

STREET	FROM	TO	PROJECT
Edgemoor	N of Kellogg	Douglas	Cape Seal
Mission	Rockwood	Central	Concrete Street Repair
Orme	Rock	Eastmoor	Concrete Street Repair
Rock	Grail	Kellogg Dr (S)	Concrete Street Repair
Area of N of Pawnee and E of Rock			Ecopave Surface Seal
13th St	Greenwich	K-96	Micro Surfacing
Central	Vassar	Oliver	Micro Surfacing
Pawnee	Oak Knoll	Rock	Micro Surfacing
Regency Lakes	21st St	Ayesbury	Micro Surfacing
16th St	Armour	Woodlawn	Preservative Seal
Armour	13th St	16th St	Preservative Seal
Bluestem	Rock	White Oak	Preservative Seal
Capri	Mt Vernon	Cherry Creek	Preservative Seal
Cherry Creek	Pawnee	Linden	Preservative Seal
Cypress	Linden	Harry	Preservative Seal
Longford	Cypress	Harry	Preservative Seal
Mt Vernon	White Oak	Capri	Preservative Seal
White Oak	Cherry Creek	Bluestem	Preservative Seal
Zimmerly	Rock	Linden	Preservative Seal
Area of W of Greenwich and S of I-35			Preservative Seal
Area of W of 143rd St E and S of 21st St			Preservative Seal
Area of N of 13th St E and W of 127th St E			Slurry Seal
Area of N of 13th St E and W of Governeour			Slurry Seal
Area of N of Harry and W of 143rd St E			Thermal Crack Repair
Area of N of 37th St N and E of Woodlawn			Thermal Crack Repair
143rd St E	Harry	Twin Lakes	Thermal Crack Repair
Harry	Triple Crown	Brookhaven	Thermal Crack Repair
Lincoln	Webb	Breckenridge	Thermal Crack Repair

District III

STREET	FROM	TO	PROJECT
Hillside	31st St S	Pawnee	Asphalt Street Repair
K-15 (NB)	Wassall	Hydraulic	Cape Seal
Broadway	MacArthur	N of 47th St S	Cape Seal
Bunting	Drolinger	Green Acres	Concrete Street Repair
Christine	Lincoln	Grand	Concrete Street Repair
Drolinger	Mt Vernon	Kinkaid	Concrete Street Repair
Erie	Kinkaid	Clark	Concrete Street Repair
Gilbert	Edgemoor	Christine	Concrete Street Repair
Kinkaid	Drolinger	Wallace	Concrete Street Repair
Kinkaid	Erie	Lorraine	Concrete Street Repair
Morris	Edgemoor	Lightner	Concrete Street Repair
Pershing	Lincoln	Orme	Concrete Street Repair
Volutsia	Kinkaid	Clark	Concrete Street Repair
Zimmerly	Edgemoor	Christine	Concrete Street Repair
Broadway	Mt. Vernon	Blake	Micro Surfacing
Funston & Roosevelt			Micro Surfacing
Hydraulic	Mt. Vernon	SE Blvd	Micro Surfacing
Lincoln	Edgemoor	Woodlawn	Micro Surfacing
Area of N of 55th St S and W of Clifton			Preservative Seal
Mt. Vernon	Greenway	Broadway	Preservative Seal
Pawnee	Mead	Hydraulic	Preservative Seal
71st St S	Cider	Rutan	Thermal Crack Repair
Cider	Grove	71st St S	Thermal Crack Repair
Grove	63rd St S	Cider	Thermal Crack Repair
Hillside	Harry	Skinner	Thermal Crack Repair
Pershing	Kinkaid	Mt Vernon	Thermal Crack Repair
Hillside	Bayley	Harry	Thermal Crack Repair

District IV

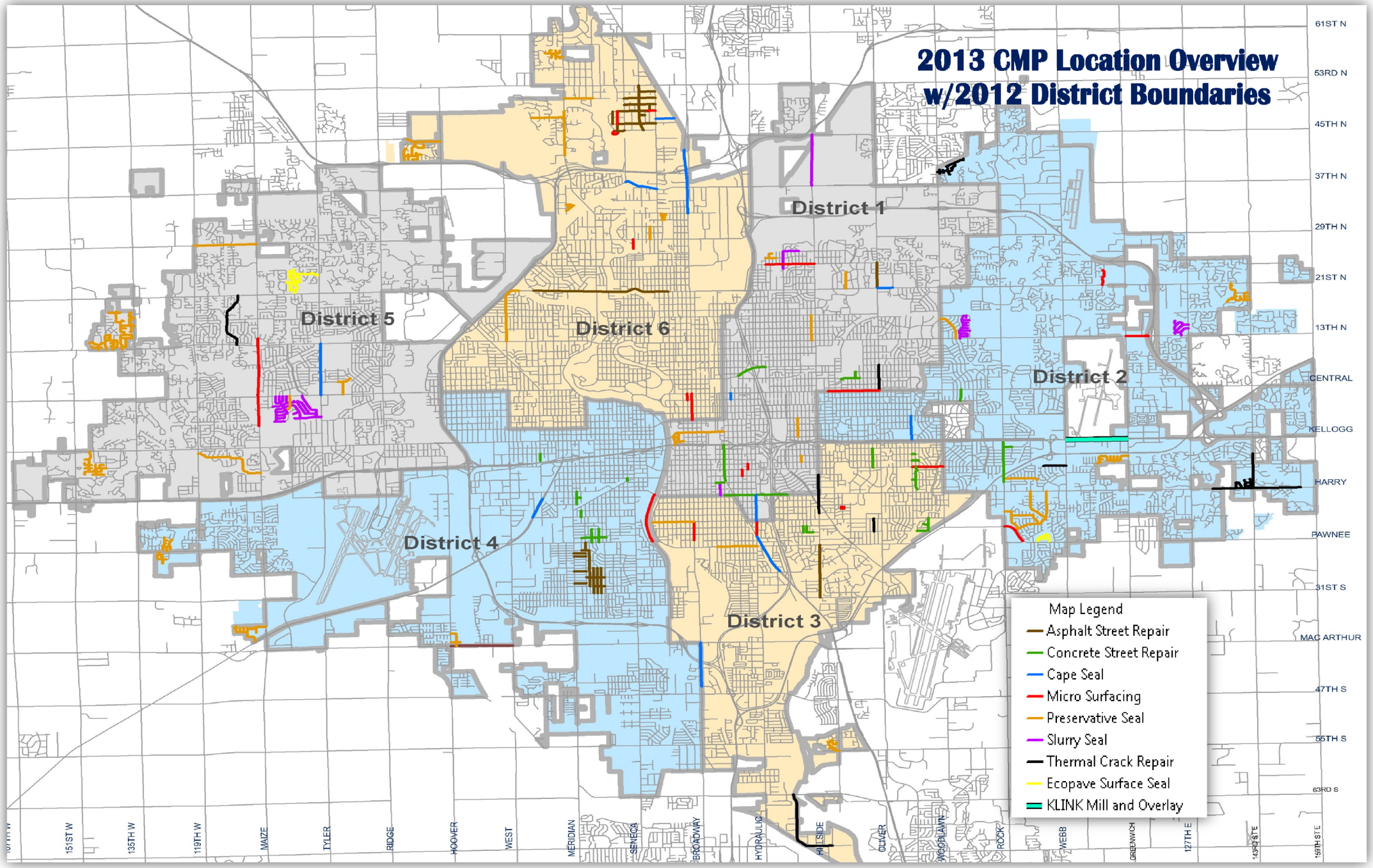
STREET	FROM	TO	PROJECT
Area of N of 31st St S and E of Meridian			Asphalt Street Repair
Broadway	MacArthur	N of 47th St S	Cape Seal
Southwest Dr	1739 S SW Blvd	2011 S SW Blvd	Cape Seal
Bonn	Pawnee	Lydia	Concrete Street Repair
Dodge	Orient	Walker	Concrete Street Repair
Euclid	Pawnee	Lydia	Concrete Street Repair
Haskell	St Clair	Vine	Concrete Street Repair
Merton	Sedgwick	St. Clair	Concrete Street Repair
Sedgwick	Esthner	Harry	Concrete Street Repair
Sheridan	Taft	S End	Concrete Street Repair
St Clair	May	Dora	Concrete Street Repair
McLean	Harry	Pawnee	Micro Surfacing
Area of N of Pawnee and E of 135th St W			Preservative Seal
Area of S of Pawnee and E of 135th St W			Preservative Seal
Area of N of MacArthur and E of Hoover			Preservative Seal
Area of W of Maize and N of K-42			Preservative Seal
MacArthur	Hoover	West St	Thermal Crack Repair

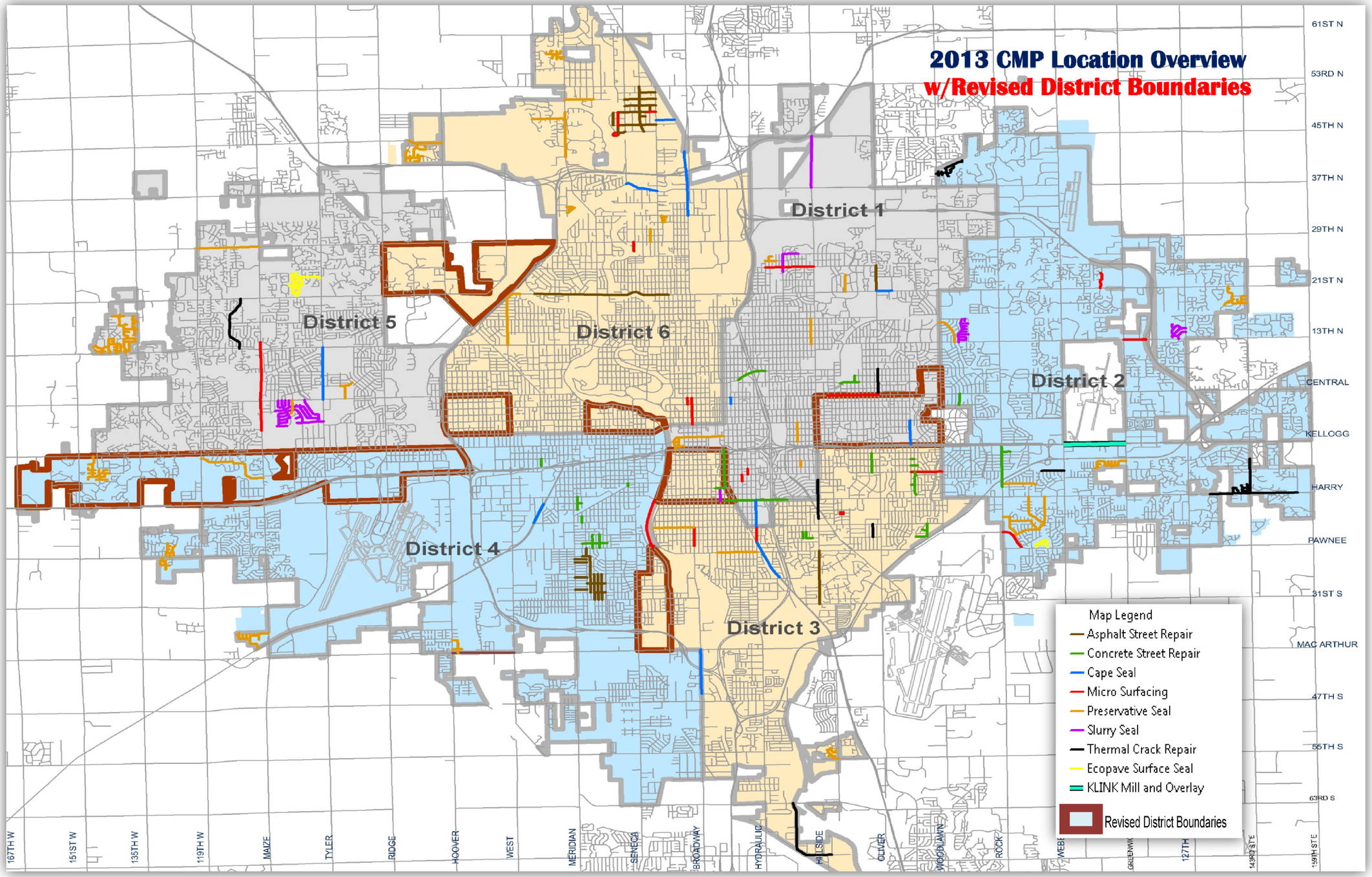
District V

STREET	FROM	TO	PROJECT
Tyler	Central	13th St	Cape Seal
Area of N of 21st St and W of Tyler			Ecopave Surface Seal
Maize	Bridge/S of Central	Central	Micro Surfacing
Maize	Central	Aloma	Micro Surfacing
Area of N of 13th St and W of 135th St W			Preservative Seal
Area of S of Maple and E of 151st St W			Preservative Seal
29th St N	119th St W	Maize	Preservative Seal
3rd St	Caddy	Fairway	Preservative Seal
Bekemeyer	Redbarn	Reca	Preservative Seal
Caddy	Central	3rd St	Preservative Seal
Hidden Valley	Circle Lake	Maize	Preservative Seal
Socora	Bekemeyer	Central	Preservative Seal
Taft	119th St W	Circle Lake	Preservative Seal
Area of S of Central and W of Tyler			Slurry Seal
Area of S of Central and E of Maize			Slurry Seal
Parkdale	21st St	13th St	Thermal Crack Repair

District VI

STREET	FROM	TO	PROJECT
Area of N of 46th St N and W of Arkansas			Asphalt Street Repair
21st St	Amidon	Bridge at McLean	Asphalt Street Repair
21st St	Amidon	Waco (W)	Asphalt Street Repair
37th St N	Arkansas	West at Bridge	Cape Seal
48th St N	Arkansas	East End	Cape Seal
Broadway	33rd St N	North at City Limits	Cape Seal
49th St N	Arkansas	Jeanette	Micro Surfacing
Broadway	Douglas	Central	Micro Surfacing
Market	3rd St	Central	Micro Surfacing
Salina	29th St N	S End	Micro Surfacing
Sullivan Cir-4648	46th St N	Alexander	Micro Surfacing
Sullivan	47th St N	49th St N	Micro Surfacing
Area of E of Meridian and S of 37th St N			Preservative Seal
Area of N of 53rd St N and W of Meridian			Preservative Seal
Area of S of 33rd St N and E of Arkansas			Preservative Seal
Area of S of 45th St N and W of Hoover			Preservative Seal
21st St	Westdale	Bridge	Preservative Seal
51st St N	Meridian	Delaware	Preservative Seal
Keywest	Meridian	Portwest	Preservative Seal
Mascot	29th St N	31st St N	Preservative Seal
Meridian	42nd St N	Harbor Light	Preservative Seal
West St	13th St	Westdale	Preservative Seal


2013 CMP Location Overview
w/2012 District Boundaries
District 1
District 2
District 3
District 4
District 5
District 6
61ST N
53RD N
45TH N
37TH N
29TH N
21ST N
13TH N
CENTRAL
KELLOGG
HARRY
PAWNEE
31ST S
MAC ARTHUR
47TH S
55TH S
63RD S
Map Legend
Asphalt Street Repair
Concrete Street Repair
Cape Seal
Micro Surfacing
Preservative Seal
Slurry Seal
Thermal Crack Repair
Ecopave Surface Seal
KLINK Mill and Overlay
151ST W
135TH W
119TH W
MAIZE
TYLER
RIDGE
HOOVER
WEST
MERIDIAN
SENECA
BROADWAY
HYDRAULIC
HILLSIDE
OLIVER
WOODLAWN
ROCK
WEBB
GREENWICH
127TH E


2013 CMP Location Overview
w/Revised District Boundaries
District 1
District 2
District 3
District 4
District 5
District 6
61ST N
53RD N
45TH N
37TH N
29TH N
21ST N
13TH N
CENTRAL
KELLOGG
HARRY
PAWNEE
31ST S
MAC ARTHUR
47TH S
55TH S
63RD S
167TH W
151ST W
135TH W
119TH W
MAIZE
TYLER
RIDGE
HOOVER
WEST
MERIDIAN
SENECA
BROADWAY
HYDRAULIC
HILLSIDE
OLIVER
WOODLAWN
ROCK
127TH
Map Legend
Asphalt Street Repair
Concrete Street Repair
Cape Seal
Micro Surfacing
Preservative Seal
Slurry Seal
Thermal Crack Repair
Ecopave Surface Seal
KLINK Mill and Overlay
Revised District Boundaries