Memorandum City of Lawrence Public Works

TO: Mark Thiel, Assistant Public Works Director

FROM: David P. Cronin, P.E., City Engineer Steven M. Lashley, P.E., Project Engineer Matt Bond, P.E., Storm water Engineer James Risner, Traffic Supervisor

Date: January 29, 2013

RE: 2012 Engineering Division Year End Report

The Engineering Division is responsible for the review and approval of all public improvement plans for streets, sidewalks, Rights of way, driveways and storm sewers. The division administers designs and inspects these projects. The division evaluates pavement condition and contracts for major pavement restoration and replacement. The Engineering Division solicits grants and other funding for major reconstruction or new construction projects.

In addition to project management, Engineering includes work groups for Storm water Engineering, Traffic Engineering, Bridge inspection, Levee inspection / monitoring, Surveying and supports services, including providing mapping and GIS functions for public information. The Engineering Division is responsible for the Farmland Industries redevelopment project including remediation efforts of ground water and future development as industrial site.

In-house Design Plans

The Engineering Division produced plan sets and construction documents for several projects in 2012 including:

- KLINK 6th Street project including: geometric improvements for dedicated right turn lane, sidewalk and bus stop on the SW corner of 6th & Kasold; bus turn out at 6th & Schwarz; and roadway widening for center turn lane between Rockledge and Iowa.
- CDBG Sidewalk Gap project: installed sidewalk on north side of Iowa from Harvard to 6th Street; sidewalk on New Hampshire St from 17th to 19th St.; sidewalk on north side of 9th from Highland Drive to Iowa; sidewalk on south side of 11th from Mississippi to Indiana; and sidewalk ramps at 11th & Vermont.

- Wakarusa Drive Reconstruction: roadway reconstruction north/south of intersection of Wakarusa Drive and Bob Billings Parkway (to be constructed in 2013).
- Crosswalk Marking Project: improvement of several intersections with permanent pavement marking for crosswalks (to be constructed in 2013).
- 18th & Kentucky HAWK Signal Installation.
- Pennsylvania Street, 8th to 9th brick reconstruction, and 9th Street, Pennsylvania Street to Delaware Street concrete reconstruction (to be constructed in 2013).
- 9th & Tennessee project: plans for traffic signal and traffic analysis for lane configuration (to be constructed in 2013)
- Bob Billings Parkway Reconstruction: roadway reconstruction, addition of center left turn lanes and shared-use path from Kasold to Crestline (to be constructed in 2013).

Iowa Reconstruction Project

The Engineering Division administered the review of the design plans, the relocation of utilities, right-of-way/easement acquisition, meetings with individual property owners and facilitated a neighborhood meeting. The project will be constructed in 2013.

Farmland Infrastructure

In 2012 plans were produced for the first phase of infrastructure improvements at the proposed industrial park including geometric improvements and the signalization of 23rd and O'Connell. Construction of the intersection improvements is to be complete in spring 2013.

Plans for the second phase of infrastructure improvements were also developed in 2012, including extension of O'Connell Rd. north of 23rd Street and an east/west road that connects O'Connell Rd to the East Hills Business Park. Construction will begin in 2013 to install the streets, storm sewer and waterline.

The 2012 Farmland Progress Report, including past history of remediation and demolition of site improvements, is attached to the end of this memo.

Kansas and Mud Creek River Levee System

Public Works is responsible for the operation and maintenance of the North Lawrence Levee Unit. It contains approximately 14.6 miles of levee on the Kansas River and 0.6 miles of levee on Mud Creek.

In March of 2012 the US Army Corp of Engineers (USACE) conducted a periodic inspection of the levee, which included a detailed and comprehensive evaluation of the condition of the levee system. The inspection noted some minor maintenance items including trees and brush within the levee slopes and more long term improvements needed: replacing degraded riprap, Mud Creek channel improvements and a location with potential for underseepage.

Public Works is working to correct issues noted during the inspection and providing the USACE a quarterly report with updates on progress to ensure our acceptable rating. Overall the levee is in good condition and the levee system should perform as intended during the next flood event.

Traffic Engineering Operations

To date we have installed battery back-ups in <u>59</u> of our <u>81</u> signalized intersections. We have 4 signalized intersections we maintain for the Kansas Department of Transportation. We have 8 High Angle Crosswalks (HAWK), 2 signalized crosswalks, and one fire station signal giving us a total of 96 signals. Out of the 81 signal intersections 48 have video detection and 2 out of the 4 intersections we maintain for KDOT 2 have video detection.

We have 14 intersections that have Flashing Yellow Arrows.

The traffic department is responsible for 24 hour vehicle and Intersection Peak Hour traffic counts. For 2012 we conducted 91 - 24 hour counts and 68 - Intersection Peak Hour counts.

ITS Projects

In 2012 we completed two major projects for our Intelligent Transportation System (ITS).



The North 3rd ITS project was completed in February. We installed 11,000 feet of fiber cable that has 144 strands of fiber. We extended the ITS conduit 2,000 feet to the intersection of 24-40 highway and 59 highway informally known as Teepee Junction. In that project we added three intersection to our ITS system and one city building (Swan building) to our fiber system. We also added 3 additional intersection cameras to view

traffic flows; this brought the Lawrence ITS system to 13 intersections manageable from our Traffic Operations Center.

The 23rd street ITS project was completed in September. We installed 15,500 feet of fiber cable that has 144 strands of fiber. In that project we added 8 intersections to our ITS system. We also added 6 additional intersection cameras.



To date we have installed 20,000 feet of fiber cable that has 288 strands of fiber, and 26,500 feet of fiber cable that has 144 strands of fiber. This gives us 46500 feet of fiber cable or approximately 8.8 miles.

Pavement Markings

This is our first year of painting our own pavement markings. We purchased an EZ-liner paint machine in March of 2012.

Between May and July the Traffic operation staff painted:

- 6th Street
- Clinton Parkway
- Bob Billings Parkway
- Haskell Ave
- Massachusetts Street
- New Hampshire Street
- Wakarusa
- Kasold

- 19th Street
- 31st Street
- Folks Road

The double yellow stripes were painted along with the white stripes and turn arrows. We also painted crosswalks for school crossings and painted the crosswalks on New Hampshire Street with the exception of 7th street. This was approximately 99,775 feet or 19 miles of roadway.



Conduit for City's Future Fiber Network

In 2012, the traffic division was instrumental in getting Verizon Wireless to install an addition 1¼ inch conduit along with 33 fiber hand holes when they installed their fiber through Lawrence. This gives us 52,800 feet of empty conduit to install future fiber. Verizon Wireless Company installed the 1 ¼" conduit from East 800 road to Wakarusa Drive on 6th Street; on Wakarusa Drive from 6th Street to Clinton Parkway; on Clinton Parkway from Wakarusa Drive to Iowa Street; and on 23rd Street from Iowa to East hills Business Park. They also installed 33 hand holes at intersections and other selected sites for future fiber optic cable.

Maintenance Program & Budget

The city's annual pavement maintenance program was reviewed and approved by City Commission on December 20, 2011. The program had an approximate budget of \$6.4 million. The program projects map had some revisions which included the addition of some mill and overlay streets, other internal street maintenance pavement rehabilitation locations, speed humps on planned mill and overlay streets, concrete crosswalks, and the postponement or carryover of reconstruction and rehabilitation locations to the 2013 program year. The As-Built 2012 Comprehensive Street Maintenance Program map is attached.

The following table displays the various contracted maintenance projects awarded and completed in 2012. A detailed photo compilation that includes these project activities will be included with the City Manager's Report on the January 22, 2013 City Commission Meeting Agenda (see the following link <u>2012 Comprehensive Street</u> <u>Maintenance - Photo Compilation</u>).

Maintenance Project	Award Date	Final Contract Amount
2012 Microsurfacing Program	Feb. 28, 2012	\$1,901,897.26
2012 Concrete Rehabilitation Program	April 17, 2012	\$690,656.00 (Encumbered – Project Extended into 2013)
2012 KLINK Overlay & Geometric Improvement on 6 th St from Iowa St to Monterey Way	May 1, 2012	\$1,084,889.01
2012 Overlay Program Phase 1	April 24, 2012	\$636,765.50
2012 Overlay Program Phase 2	June 5, 2012	\$1,215,804.84
2012 Crack Seal Program (Internal)	Approvals March 27 & Dec. 11, 2012	\$91,600.12

Tom Research rank way to oread west bi 2015 Hogram	2012 CIP Reconstruction of Wakarusa Dr from Research Park Way to Oread West Dr	To be included in 2013 Program	NA
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Contracted Maintenance and Internal Street Maintenance work performed throughout the 2012 program year included:

Work Type	Contracted Maintenance - 2012	
Mill & Overlay	22.0 lane-miles	
Microsurfacing/ Patching	32.6 lane-miles	
Concrete Rehab Patching	6,533 Square Yards (To Date)	
Curb & Gutter	19,354 Linear Feet (To Date)	
ADA Ramps	45 Ramps	

Work Type	Internal Street Maintenance - 2012
Crack Sealing	92,390 lbs
Potholes Patched	6,041 potholes (536 tons + 293 SY Durapatch)
Concrete Patching	1375 Cubic Yards (~ 7,000 Square Yards)
Curb & Gutter	6,525 Linear Feet
ADA Ramps	29 Ramps

Maintenance Projects & Highlights

Work began on the **2012 Microsurfacing Program** (Project No. PW1204) in early April of 2012. The pavement patching and microsurfacing contract was completed in early November of 2012. The pavement patching prep work included partial and full depth asphalt pavement repairs. There was a significant increase in the amount of asphalt tonnage needed over the course of the project for the patch work which resulted in an extended project completion date as well as requesting and receiving authorization for use of an additional \$400,000 from the infrastructure sales tax fund. Based on the extent and increase of patching quantities, previously identified alternate locations for patching and microsurfacing were carried over to the 2013 program.

Microsurfacing, in conjunction with patch work, has shown to be an effective preventative maintenance technique to improve pavement condition for streets that are generally in good condition. In addition to this maintenance work, the City installed new bicycle shared lane use pavement markings on Monterey Way from W 6th St to Bob

Billings Pkwy and on Connecticut St from E 7th St to E 15th St. Also, Public Works staff facilitated a partnership with Parks and Recreation Department to collaborate efforts in the enhancement and beautification of the intersection at N 3rd St and KTA access ramps in conjunction with the microsurfacing/patching of the N 2nd St/3rd St corridor from Lincoln St to the north City limits.

Work began on the **2012 Concrete Rehabilitation** (Project No. PW1205) in late April. To date, this concrete rehabilitation project has included intermittent curb repair and replacement, replacement of adjacent concrete sidewalk impacted by curb repairs including access ramps, and various concrete street pavement removals and replacements. The street curb and gutter and concrete pavement sections being worked on are in poor condition with extensive concrete deterioration. Currently, the project is approximately 85% complete and the completion timeline has been extended to late March of 2013. So far there has been a general increase in overall patching quantities which led to the request and approval of the reallocation of \$200,000 from other previously approved budget funds to support continued work on planned concrete streets.

Imprinted concrete sidewalks were installed at the intersections of W 12th St on Ohio, Tennessee, and Kentucky streets. These crosswalks were inspected along with the rehab contract but were originally approved with the 12th St Lighted Pathway Project and were performed as a continuation of the Sidewalk Gap Program.

Concrete rehabilitation projects are primarily focused on the removal and replacement of existing failed concrete pavement without the inclusion of an asphalt overlay. With the goal of preservation in mind, Public Works has been steadily rehabilitating concrete pavements to extend the life cycle of the street and delaying the need for an asphalt overlay. Once a street has received an asphalt overlay application, deterioration will persist and could even become accelerated. The typical life cycle of a concrete street exceeds that of an asphalt street and returning to a concrete street after an overlay would most likely require reconstruction.

2012 KLINK Project, W 6th St from Monterey Way to Iowa St (Project No. PW1201) began in late May and was substantially completed in August of 2012. The 2012 KLINK project consisted of a mill and overlay, concrete curb and gutter replacement and full depth patching where needed. The project also included three geometric improvements: the addition of an eastbound right turn lane including a bus stop and sidewalk at W 6th St & Kasold Dr, an eastbound dedicated bus turnout at W 6th St & Schwarz Rd, and a section of road widening on W 6th St between Rockledge Rd and Iowa St to install a center turn lane. In addition, new sidewalk was installed along the south side of W 6th St from Gateway Ct to Lawrence Ave.

The **2012 Overlay Program Phase 1** (Project No. PW1209) project began in mid-May. This milling and overlay project was completed in early July of 2012 and included a number of City residential streets along with the arterial Kentucky St from W 12th St to W 19th St. The street mill and overlay sections worked on were determined to be in generally fair to poor condition and had deteriorated beyond the point at which costeffective preventative maintenance techniques could be performed. This type of minor rehabilitation work is utilized when some structural deficiencies exist along with other signs of progressed deterioration that lead to poor drainage and diminished ride quality. An effective milling and overlay program will re-establish desired drainage, structural, and ridability characteristics to a street and reduces other long-term maintenance and rehabilitation costs.

Installation of traffic calming speed humps was also included in this project. After the review by Historic Resources Commission, two humps were installed on Massachusetts St south of 23rd St and two humps were also placed on Winona St from Massachusetts St to Barker St.

The **2012 Overlay Program Phase 2** (Project No. PW1210) project began in early July and completed in mid-October. This milling and overlay project also included some curb and gutter removal and replacement on City residential, collector, and arterial streets. Similar to Overlay Phase 1, these streets were generally in fair to poor condition and the maintenance work has improved drainage characteristics and structural capacity. The planned milling and overlay/ curb and gutter work on the pavement segment of Bob Billings Pkwy from Wakarusa Dr to Foxfire Dr was deferred to the 2013 program year and will be coordinated with the reconstruction of Wakarusa Dr from Research Park Way to Oread West Dr. As an alternate, staff included the additional work of milling and overlay on E 8th St from Connecticut St to the RR tracks and also on Lyon St from N 3rd St to N 4th St as part of this project.

The Public Works Internal Street Maintenance Division took on the project work for the **2012 Crack Seal Program** (Project No. PW1211). The City purchased crack sealing materials, incorporated the use of some contracted labor, and also purchased crack sealing equipment (machine). Internal street maintenance crews have been managing the schedules and directing the field work. Progression has been relatively slow; however, the quality of work and effectiveness of material application has exceeded prior crack sealing contracted work. The overall effectiveness of this project has been evaluated and continues to be successful through internal operations. Toward the end of 2012, daily output had increased to an average of 1,000 lbs per day. As the crack sealing program continues to be successful, it is our plan to maintain a five to seven year rotation throughout the city and to ensure that every street is sealed in that time frame. We will continue to seal streets each year that received other forms of maintenance from the prior year.

This crack and joint sealing project included a number of residential, collector, and arterial streets. Streets to receive crack sealing are determined to be in generally good condition. Crack sealing is applied to cracks and joints to prevent the intrusion of moisture into the subgrade and to slow pavement deterioration. Over time, water infiltration through cracks and joints will lead to subgrade destabilization and additional pavement distresses. This remains one of our most important maintenance tools in the effort to maintain our city streets.

The **CIP Reconstruction of Wakarusa Dr from Research Park Way to Oread West Dr** (Project No. PW1202). In-house design was completed in July of 2012. Construction is now scheduled from 2013 spring graduation to August of 2013. The project consists of a complete concrete reconstruction of Wakarusa Street from North of Oread West Dr to North of Bob Billings Parkway, and from South of Bob Billings Parkway to North of Research Park Way. This section will be widened to provide five driving lanes and two bike lanes of 10" concrete as well as new sidewalk and storm sewer improvements. A left turn (center) lane through the section will be included to improve traffic flow and safety. The bike lanes will add to the connectivity of bicycle routes currently in Lawrence.

We are making significant progress towards improving roadways in Lawrence with the contracted street maintenance program. Internal street maintenance crews have also played a key role in making this maintenance year a success. Some of the multiple work locations include Minnesota St, Northwood Dr, Kenwood Dr, Pinewood Dr, where curb and gutter and concrete valley gutters/intersections or concrete patching were removed and replaced in coordination with planned contracted milling and overlay projects (see program map for other internal street maintenance major work locations). As mentioned with the microsurfacing project update, Public Works and Parks and Recreation Department organized their efforts in the enhancement and beautification of the intersection at N 3rd St and KTA access ramps. This type of collaboration on projects has enhanced the overall impact to several City streets and intersections. As reflected in the most recent citizen survey, the residents of Lawrence continue to place a high importance on street maintenance.

Public Works staff completed the third phase of Cycle 3 street ratings in November of 2012 and plan to continue street ratings this year with the goal of completing the last quarter of the cycle this Summer/Fall period followed by an evaluation of the data collected. This information will continue to assist Public Works by utilizing the street pavement rating data to produce projected maintenance plans for future street maintenance program years. Having a projected maintenance plan will increase our effectiveness in programming street sections for upcoming maintenance years and will continue to be an ongoing project from one maintenance year to the next. As displayed by the <u>Pavement Management Program update</u> presented to City Commission on January 15, 2013, we believe that the maintenance program is working and the continued support from City Commission has given us the ability to make progress.

Attachments: 2012 As-Built Map 2006 – 2012 As-Built Map Farmland Progress Report