Memorandum
City of Lawrence
Public Works Department

To: David L. Corliss, City Manager
Debbie Van Saun, Assistant City Manager
Casey Liebst, Budget Manager

From: Charles F. Soules, Public Works Director

Subject: 2008 Budget Request -- Letter of Transmittal

Date: April 12, 2007

With this memo, I transmit to you the Public Works Department budget request for 2008. To facilitate easy reading and reference, please find attached a chart summarizing significant issues, changes, and program improvement requests for each division of the department.

The total operating budget requested for the Public Works Department is over $29 million, excluding program improvement requests or budget increases for general wage adjustments. In 2006, the department reorganized into three primary sections: engineering and capital projects (engineering, traffic & stormwater engineering, and support services), infrastructure management (pavement management, street and stormwater maintenance, and buildings and structures), administration and services (administration, solid waste, and central maintenance garage). Approximately 180 Public Works employees provide core community services and projects that are vital to the growth, health, safety, comfort and quality of life for our community.

The most critical issues facing Public Works are adequate funding for infrastructure maintenance (pavements, facilities, and equipment, etc.), adequate staffing to meet service demands and expectations, and the completion Wakarusa Service Center. The program improvement packages submitted relate directly to the efficient, cost-effective management of our infrastructure.

In December 2005 the city completed the first pavement condition rating. This information identified a large backlog of work that needed to be completed. The initial goal of the pavement management program was to prevent further deterioration of streets beyond the point at which preventative maintenance measures would no longer be cost effective (keeping the good pavement in good condition). For 2007 staff presented a pavement maintenance program including crack sealing, microsurfacing, mill and overlay, and curb and gutter repair. The work completed in 2006 has slowed the deterioration rate of the streets that were completed; however, continued effort needs to be maintained annually as the overall average PCI continues to decrease. Significant funding increases are requested for street maintenance priorities.

Staffing resources are needed in the building and structures division to address a variety of issues. An electrician and lighting specialist is requested for the downtown area. This request will centralize downtown responsibilities and accountability for lighting and electrical issues for downtown and roundabouts. Other staffing needs identified by the department are summarized here for information only. A half-time maintenance person is needed for the 90,000 square feet Community Health Facility. One full-time maintenance person is currently providing all services for this structure. Additional custodial services are also requested to maintain City Hall, in accordance with industry staffing standards. Program improvement requests for these positions have been withdrawn due to lack of resources.

Finally, the Wakarusa Service Facility is critical for Public Works operations. The facility will house the street, stormwater, and traffic maintenance functions. This issue was outlined for the City Commission at a recent study

session. It is an on-going and high priority for the department.

We look forward to the opportunity to answering your questions during our budget session and further discussing financing and infrastructure maintenance issues at the study session scheduled in June.

Respectfully submitted,

Charles F. Soules

Charles F. Soules, P.E.
Director of Public Works

Public Works Budget Attachment 2008
Critical issues and program improvements

STREET MAINTENANCE DIVISION **(includes gas tax, general fund maintenance, levee, portion of airport budgets)**	
Significant issues	Adequate funding pavement management program Replacement of major construction equipment Adequate funding for materials Protection of Gas Tax Fund fund balance Funding for radio replacement phasing plan (current system obsolete) General infrastructure financing
Program Improvement requests	
General Fund Streets (3000)	**Street Maintenance Funding Program – 2008** This funding request is consistent with information to be presented to the City Commission regarding pavement maintenance needs. Slightly over $2.8 million has been requested as part of the regular budget submittal ($2.1 million general fund, 715,000 gas tax). This request may or may not be approved. This program improvement package requests an additional $3.65 million, as the needs have been outlined for the City Commission.
General Fund Streets (3000)	**Radio replacement program – phase 1** The current radio system is being phased out by the FCC. The radio replacement program allows the City to partner with public safety agencies, county, and state to share infrastructure and provide the best possible services to Lawrence residents during disasters and emergency response.

General Fund Streets (3000)	**Equipment replacement for Street Division** The street division has a significant backlog of equipment that greatly exceeds its expected useful life by industry standards. Maintenance costs are escalating and reliability is low. Equipment needs were articulated for the City Commission regarding street maintenance needs. The program improvement package is requested in addition to the equipment replacement already included in general fund, gas tax, and stormwater. Options are provided for funding the package in a one year or two year implementation strategy.
General Fund Streets (3000)	**Sidewalk Connectivity Program** Request for a multi-year program to address connectivity and pedestrian transportation. The program would address the primary objectives of completing the sidewalk network on both sides of arterial streets with highway designations, one side of all other arterial and collector streets. This is requested for multi-year implementation at $250,000 per year for six years. In 2007, the City Commission funded $125,000 of the requested program.
Other notes / comments	**Gas tax fund balance** The fund balance for this fund has been used over many years to support general operations. It is important for all decision makers to stay aware of the reduction of the fund balance. Historically, the Gas Tax Fund has been relied upon for the preponderance of employees assigned to maintenance activities, overlay and contracted maintenance, and all heavy equipment and vehicles utilized by maintenance staff. No program improvements are requested and there have been reductions in the maintenance funding in the Gas Tax Fund in an on-going effort to protect the fund balance.

ENGINEERING DIVISION

(includes engineering, traffic division, and stormwater utility)

Significant issues	Adequate funding for training /professional development Replacement of equipment in a cost effective manner Funding for intersection striping (additional)
Program Improvement requests	
General Fund Traffic (3200)	**Intersection striping program** Request additional funding for pavement markings. This program would be dedicated to refreshing the striping at high volume intersections.
Other notes / comments	**Traffic calming devices (not submitted)** Funding for traffic calming devices was submitted for consideration in the Capital Improvement Program

BUILDINGS AND STRUCTURES **(includes building maintenance, health facility, arts center, portions of airport and downtown)**	
Significant issues	Adequate funding for preventive maintenance Adequate level of staffing for all facilities Adequate staffing for custodial and maintenance services
Program Improvement requests	
Downtown Parking Fund	**Electrician (downtown lighting, electrical, roundabouts)** Public Works requests an additional electrician to be dedicated to downtown maintenance. Currently, functions are completed by a combination of building maintenance, traffic engineering, and parks and recreation. There is confusion over work responsibilities, funding, and accountability. The addition of an electrician would centralize all responsibilities for lighting and electrical maintenance in the central business district. The person would also provide services for roundabouts.
General Fund Building Maint	**Custodian 1** Industry standards recommend 2.8 custodial FTE's to provide service to a 30,000 s.f. facility with 100 occupants, similar to City Hall. Presently, we have 1 staff person providing custodial services supplemented by part-time, temporary staff when funding is available.
General Fund Community Health	**½ time maintenance worker** A half-time regular employee is requested to assist with labor and maintenance responsibilities for the Community Health Facility, a 90,000 s.f. facility housing three agencies. This fund is reimbursed partially by Douglas County.
Other notes and comments	**Garage sweeper** The small Tennant sweeper that cleans the downtown parking garages needs to be replaced. Public Works does not budget for the downtown parking funds.
CENTRAL MAINTENANCE GARAGE	
Significant issues	Adequate funding for parts and fuel Expansion of facilities and storage is critical Incorporation Fire Medical Fleet management

Other notes / comments	The garage budget is an internal service fund. Services are billed to user departments as needed. Critical line items are requested at levels high enough to ensure budgetary authority, if it is needed (e.g., parts, commercial repairs including body work, and fuel). Funding requests have been submitted for replacement of the tire shop and several pieces of critical shop equipment. The garage has a fund balance forward sufficient to pay for the tire shop replacement. All other budget items would be covered by billed services.
SOLID WASTE DIVISION **(includes residential, commercial, and waste reduction / recycling)**	
Significant issues	Reasonable and consistent rate adjustments to address operational needs and increasing costs (fuel, steel, labor) Replacement of equipment in a cost effective manner Provide accurate data and information to the City Commission regarding possible enhancements to solid waste services
Program Improvement requests	
Solid Waste Residential and Commercial	**Equipment enhancements to comply with truck weight restrictions** The division is proposing to equip an additional 10 – 12 solid waste rear loader trucks with pusher axles to comply with city truck weight ordinances when fully loaded and compacted. An memo outlining various compliance options will be presented to the City Manager's office in May.
Solid Waste WR/R	**Citizen survey regarding curbside recycling** The RRCAB has expressed strong and continued interest in enhancing city support of curbside recycling services, up to and including city sponsored or city provided services. The department recommends conducting a professional, externally managed survey to measure citizen interest in curbside services at various price points (e.g., do they want curbside collection if it costs $7 / month? $5 / month?)
Other notes / comments	The budget presented requires a rate increase, without the addition of the program improvement packages. Please note that a significant amount of equipment replacement is being deferred an additional year to achieve this level of rate increase. Maintenance of the equipment replacement schedule is critical to providing the quality, timely services that are expected by our customers. The rate study is not yet fully complete – key data missing include the fund balance forward and personnel costs for 2008. I preliminary study will be completed by the first week of May.

Attachments:
Pavement memo
Stormwater memo

Memorandum
City of Lawrence
Public Works Department

TO: Dave Corliss, City Manager
Debbie Van Saun, Assistant City Manager
Charles Soules, Director of Public Works
FROM: Dena Mezger, Assistant Public Works Director
Steve Lashley, Project Engineer- Infrastructure Management
Date: March 12, 2007
RE: Pavement Maintenance Program Update & Evaluation

Background

In 2005 the first pavement rating cycle was completed for all streets in the city. The rating was the first step in establishing a more formalized ongoing pavement maintenance program. (Copies of earlier reports outlining the results of the first rating cycle are available if needed.) A second evaluation and rating of 25 percent of the city's streets was completed in February 2007. Information from the second rating cycle is being used to evaluate the effectiveness of the pavement maintenance program. The second cycle generally covered streets in the area south of 23rd Street.

Program Goals

The initial goal of the Pavement Maintenance Program was to prevent further deterioration of streets beyond the point at which preventative maintenance measures would no longer be cost effective. The critical point has been defined as a Pavement Condition Index (PCI) of 65 for arterials, 60 for collectors, and 55 for residential streets. Streets with PCIs below those values have been termed "unacceptable." The first rating cycle indicated that 31.5% of streets in the city fell into the "unacceptable" range. The initial program recommended a mill and overlay treatment for arterials with PCIs in the range of 65-74, for collectors with PCIs in the range of 60-67 and for residential streets with PCIs in the range of 55-60 over a three year period from 2006 through 2008 to prevent more streets from falling into the unacceptable category. The PCI ranges for recommended improvements were based on initial estimated deterioration rates for the various classes of streets.

Program Funding and Progress

In late 2005 it was estimated that a total of $17.3 million would be needed in 2006 ($6.0M), 2007 ($6.4M) and 2008($4.9M) for the contracted mill and overlay program to prevent the "borderline" streets from being downgraded to unacceptable condition. This amount did not include any funding for crack sealing or microsurfacing programs (generally used on streets with higher PCIs), major curb and gutter replacement (initially estimated at $12.5M), nor Street Division funding for routine asphalt and concrete pavement maintenance activities. Additional funding was recommended for those programs. Actual funding allocated for contracted maintenance services, including the crack seal program, microsurfacing, curb and gutter repairs, and KLINK projects, was $4,467,500 in 2006 and $4,735,000 in 2007. A copy of the summary for streets from the 2007 budget is attached with funds allocated for contracted maintenance highlighted. With those funds the following maintenance has been, or will be, completed by the end of 2007.

Contracted Maintenance	2005	2006	2007 (proposed)
Mill & Overlay, miles	9.80	12.80	7.52
Crack Sealing, pounds	75,000	386,580	225,000

Microsurfacing, miles	0	0	12.76
Curb Replacement, miles	8.1	10.2	6.4

In addition to the maintenance programs, several other street projects are planned to begin in 2007 or are already underway. The projects will address maintenance issues and positively impact condition ratings where the work is being done. Those projects include 2nd and Locust, Wakarusa and Clinton Parkway (in association with the Miracon project); 4th Street, Maine and Michigan as part of the Lawrence Memorial Hospital project; and both Kasold capital projects.

Impact of Program

The impact and effectiveness of the pavement maintenance program can be estimated based on several factors determined through the pavement rating system. One measure is the change in the average PCI. Another measure is the change in the rate of deterioration of the pavements. The deterioration rate represents the reduction in PCI each year as the pavement ages and wears. A large negative number indicates a rapidly declining pavement condition The overall progress of the program may also be reflected by the change in percentage of streets with PCIs in the unacceptable range.

Average PCI

The average PCI for all streets established during the initial rating cycle was 69.0. Taking into consideration the maintenance performed since that time, the continued deterioration of other streets, and the results of the second rating cycle, the average PCI for all streets is anticipated to be 66.2 at the end of 2007. However, the averages just for the 25% of streets rated during Cycle Two of the condition rating process (south of 23rd Street), were also calculated separately. Since many of the street segments in the second cycle had been crack sealed, and a few milled and overlaid since the first cycle, this provided the opportunity to evaluate more specifically the benefit of these maintenance activities. Those streets showed less change in the average PCI. The average PCI from the first rating cycle for this area was 70.94. The average PCI calculated from the second cycle ratings is 70.04. Although these averages do not reflect any deterioration during 2007, the additional maintenance planned for the area during that time period could be expected to at least offset the deterioration and possibly increase the average slightly.

Deterioration Rate

During the initial rating cycle the deterioration rates were calculated for various street classifications and pavement types. Updated deterioration rates were calculated for the second rating cycle based on the change in PCI for each street segment from the initial rating cycle. A summary of results of the second rating cycle is shown in the attached table. The average deterioration rate for the 25% of streets recently evaluated is compared to the average rate for the entire city as established in the first cycle. The data were analyzed and grouped by pavement type and street classification as shown. Since there were only a few arterial streets included in the evaluation, the results are reported as an overall average for all pavement types.

Unacceptable Streets

As indicated previously, the initial rating cycle determined that the PCI of 31.5% of streets fell in the unacceptable range. Taking into consideration the pavement maintenance performed to date but with the continued deterioration of other streets, it is anticipated at the end of the 2007 program 35.7% of streets will fall within the unacceptable range based on PCI.

Evaluation of Results

Results of the second rating cycle indicate that the maintenance programs are slowing or reversing the deterioration rates. The positive numbers for deterioration rates indicate the average PCI has actually increased for those specific streets. However, overall the pavement maintenance programs are not keeping up with the deterioration as evidenced by the anticipated decrease in average PCI and increase in percentage of unacceptable streets. This can be attributed to the fact that not enough of the previously identified “borderline” streets have

been included in the program to slow the deterioration and prevent the PCI from declining beyond the critical point.

Continuing Improvements

The city's asphalt pavement specification is being updated to use oils that provide an improved paving material. A higher grade of oil will be used on high-volume roads to reduce rutting, a major problem in areas of heavy truck traffic. Recycled material is being allowed but there are basic criteria it must meet in order to obtain more consistency throughout the projects. Material testing is being increased to better ensure that the pavement being placed meets the specified requirements. North Iowa between Peterson Road and West 2nd St (near Hallmark), is an example of an area where material failure is the cause of the deteriorated pavement condition. Ensuring quality material at the time of placement may have eliminated this problem.

In addition to upgraded materials, a provision is being added to the specifications to adjust payment based on the quality of the finished product. Like KDOT, the specifications will outline reductions in payments for in-place pavement densities below the specified minimum.

Microsurfacing has been added this year as another preventative maintenance tool. This process is generally intended for use on streets that are still in relatively good condition in order to prolong pavement life. If the underlying pavement is in good condition, microsurfacing can be expected to add approximately 5 years or more to the life of the pavement.

Staff members in Engineering and Street Maintenance have also been working to coordinate in-house maintenance activities with the contracted program. The intent is to make the most effective use of funds and to have a coordinated program that addresses maintenance priorities in a logical manner, whether work is performed by city or contractor forces. The program will transition over the next couple of years to a process that allows in-house crews to perform an increased portion of the patching and repairs well in advance of the contracted maintenance.

Policy Issues

More defined goals and expectations for the pavement maintenance program would be helpful in determining the scope of the annual program. The approach to selecting streets for maintenance and the budget request need to be tailored more closely to what the City Commission and the public expect for the program.

When the program was initiated the proposed goal was to perform the work required to keep streets from deteriorating to an unacceptable pavement condition as defined by the PCI. To do that, it was projected that $17.3 million would be required for contracted maintenance in 2006 through 2008. That funding was not available, however, and the initial goal has not been met. If the expectation is that the program will meet that initial goal, or even begin to reverse the decline in overall pavement condition within a certain amount of time, significant amounts of funding will be necessary. An alternative approach is to simply do as much as possible with the available funding without focusing on the city's overall pavement condition rating or percent of unacceptable streets.

A policy on maintenance of brick and brick composite streets also needs to be finalized. Although the overall percentage of brick pavement is relatively low, the very low PCIs for those streets do have some impact on the city's average condition ratings. At this time there is no maintenance work being performed on the brick pavements pending the policy decisions.

What else needs to be done?

Some streets simply need to be rebuilt. In the first rating cycle 31.5% of streets in the city were identified as being "unacceptable", or deteriorated beyond the point where typical preventative maintenance measures will be beneficial. Generally speaking, pavement with a PCI below 50 requires at least significant full-depth patching of the base layers and subgrade repairs if not complete removal and replacement. Some examples of such streets

include Kasold north of Bob Billings Parkway (PCI 46.3) and 19th Street between Naismith and Louisiana (PCI 31.5). As currently structured, the pavement maintenance program is aimed at preventative maintenance and does not address such extensive rehabilitation.

Some of these streets are being included in the overlay program although the poor initial condition generally results in the maintenance being a short term “band aid.” Using preventative measures on streets that are too far gone reduces the return on investment. In addition, when these relatively extensive base and subgrade repairs are made as part of the mill and overlay program, less funding is available to address streets that could better benefit from true preventative measures. As maintenance is deferred longer on the “borderline” streets the extent of required repairs will increase, essentially reducing the “bang for the buck” in the preventative maintenance program.

Budget Implications and 2008 Funding

As currently proposed the 2007 program includes approximately $3.8 million for mill and overlay (including KLINK) and curb replacement, $600,000 for microsurfacing, and $300,000 for crack sealing. Of those amounts, it is estimated that at least $200,000 will be needed to patch the most deteriorated areas before resurfacing.

The budget request for 2007 was for $6 million just for contracted maintenance programs (exclusive of the KLINK funding) with $1 million of that amount just for microsurfacing. The additional funding would have added 6.5 miles of streets to the mill and overlay program and approximately 8 more miles of microsurfacing. With that additional maintenance it is projected that the percent of unacceptable streets would have increased to only 33.4% (from 31.5%) as opposed to 35.7% anticipated at current funding levels.

Currently, a large program has been identified for the 2008 contract pavement maintenance program because of the number of streets deferred from 2006 and 2007 due to budget constraints. The estimated cost of that 2008 program (excluding KLINK) is shown below.

Mill & Overlay	$ 6,725,000
Curb Replacement	1,151,000
Microsurfacing	1,424,000
Crack Sealing	190,000
Subtotal	$ 9,490,000

Additionally, to microsurface streets that are crack sealed in 2007 would cost another $370,000, bringing the total estimated cost to $9,860,000. Adding $450,000 for a KLINK project brings the total to $10,310,000. Clarification of the program goals and expectations would assist staff in determining how much of this funding should be requested. Requests of approximately $6,000,000 have been made in previous years. That amount would certainly expand the program beyond the scope of the 2006 and 2007 programs. Of course, expected budget constraints may dictate the program independent of goals and expectations.

Conclusions

The basic message from the results of the recent analysis appears to be that preventative maintenance is effective where used but overall the pavement condition in the city apparently is declining. The “bad” streets are getting worse and negatively impacting the overall condition ratings. Substantial additional funding would be necessary to reverse this trend if that is the goal of the program. Clearer direction on program goals and expectations would assist staff in developing recommendations in the future.

Option C

Funding for Streets/Curb/Ramp/Sidewalk Repairs (excludes City Personnel, equipment costs, etc.)

			2005 (actual)	2006 (budget)	2007 (budget)	2008 (proj.)	2009 (proj.)
001-3000	**General Fund**						
45-08	Mill & overlay		575,400	1,300,000	780,000	1,750,000	
45-10	Curb repair		424,983	425,000	425,000	425,000	
45-14	Crack Seal		93,750	500,000	300,000	300,000	
45-02	Asphalt		98,755	100,000	120,000	120,000	
45-01	Misc. repairs		58,996	40,000	55,000	55,000	
99-99	Contingency		0	0	100,000	100,000	
Sub-total			*1,251,884*	*2,365,000*	*1,780,000*	*2,750,000*	*2,500,000*
214-3800	**Gas Tax Fund**						
45-08	Mill & overlay		600,375	750,000	700,000	700,000	
45-09	Chip & seal		65,697	75,000	75,000	100,000	
45-10	Curb repair		118,665	165,000	165,000	175,000	
45-12	Sidewalk		0	25,000	25,000	25,000	
45-02	Asphalt		24,790	48,000	60,000	60,000	
45-01	Misc. repairs		49,499	45,000	60,000	60,000	
Sub-total			*859,026*	*1,108,000*	*1,085,000*	*1,120,000*	*1,200,000*
505-3900	**Stormwater**						
45-10	Curb repair		121,471	150,000	140,000	140,000	
99-99	Contingency		0	150,000	175,000	200,000	
Sub-total			*121,471*	*300,000*	*315,000*	*340,000*	*350,000*
	301Bond & Int						
	Street maint.	(City's share)	500,000	400,000	450,000	450,000	
		(KDOT share)	200,000	200,000	200,000	200,000	
Sub-total			*700,000*	*600,000*	*650,000*	*650,000*	*1,000,000*
	Reserves						
	Sales Tax		0	0	867,000	850,000	
	Cap Imp		0	502,500	233,000	0	
	Stormwater		0	0	400,000	400,000	
Sub-total			*0*	*502,500*	*1,500,000*	*1,250,000*	*0*
Sub-total	*Highlighted Items*			*4467500*	*4735000*		
	Highlighted figures = Funds		Available for Contracted Maintenance				
TOTAL			**2,932,381**	**4,875,500**	**5,330,000**	**6,110,000**	**5,050,000**

Note: The plan for 2009 is to reduce funding on preventative maintenance in order to allow for a focus on the "failed" streets inventory; projects to re-build the streets in this inventory will be debt-financed in addition to applicable funding from KDOT. Failed streets are more likely to be complete re-builds and thus more appropriate for debt financing due to their anticipated longevity once re-built.

Summary of Deterioration Rate Analysis

Street Classification	Pavement Type	Cycle 2 Avg Annual Deterioration in PCI*	Cycle 1 Avg. Annual Deterioration in PCI
Arterial	All	-3.26	-5.56

Collector	Composite (asphalt over concrete)	1.07	-5.66
	Flexible (asphalt) w/no past overlays	-1.20	-2.48
	Flexible w/past overlays	-0.84	-11.09
Residential	Composite	0.66	-3.72
	Flexible (asphalt) w/no past overlays	-1.17	-2.32
	Flexible w/past overlays	4.46	-5.18
	Rigid (concrete)	-1.10	-1.42

*Based on 2nd rating of 25% of city's streets.

Memorandum
City of Lawrence
Public Works

TO: Dave Corliss, Debbie Van Saun, Charles Soules, Tammy Bennett, Dena Mezger, Shoeb Uddin
FROM: Matt Bond
Date: April 4, 2007
RE: Stormwater Utility Overview

This memo provides a requested overview of the stormwater utility including; capital improvement projects, the maintenance of existing stormwater infrastructure, recommendations concerning the North Lawrence Drainage Study and the recertification of the North Lawrence Kansas River Levee.

CAPITAL IMPROVEMENT PROJECTS
The stormwater utility is currently paying off two separate general obligation bonds resulting from the completion of capital improvement projects. These double bond payments continue through the end of 2009, the payoff for the complete debt service runs through the end of the year 2017, refer to the attachment. Since current expenditures exceed revenues and the fund balance forward is being spent down, implementation of any new capital improvement projects will be delayed. Without additional bond purchasing, a stormwater utility rate increase or some sort of additional funding mechanism, higher end capital improvement projects will not be possible in the immediate future. Examples include the following projects:

- Ø 23rd & Ousdahl (1996 Estimate - $1,022,800) (w/possibly partial grant funding)
- Ø Maple Street Pump Station (NLDS-System 6) (Dec. 2005 estimate - $4,375,000)
- Ø 8th/9th and Holiday (1996 Estimate - $130,000)
- Ø Alabama, 17th to Naismith Drive (1996 Estimate - $2,563,100)
- Ø Maple Lane, 19th to Brook (1996 Estimate - $1,080,000)

When opportunities to stretch funding present themselves, such as the 2nd and Locust state project, storm water upgrades will be implemented when possible. Additionally smaller projects can be kept for in-house engineering and construction. These projects would be constrained to minimal material cost accrual. The cost of future

capital improvement projects will need to be balanced between nuisance flooding and storm sewer infrastructure maintenance. Projects alleviating flooding problems which cause structure damage will be given the highest priority.

EXISTING STORMWATER INFRASTRUCTURE

The lack of funding for capital improvement projects provides an opportune time to develop and implement a more structured storm sewer maintenance program. There are 137.57 miles of storm sewer lines within the city. Of these existing storm sewer pipes 48% of them are 25 years or older and 17% are 50 years or older. A systematic inspection of all curb inlets will take place over the next year. Upon completion of the data collection; pipes, curb inlets and junction boxes will be evaluated to structure a maintenance and replacement program. To help comprehend the size of the task being undertaken the current GIS data is listed below:

- Ø 4385 curb inlets
- Ø 249 area inlets
- Ø 1287 manhole/junction box
- Ø 1088 end sections

In addition to structuring a formal maintenance program, staff will focus on long range watershed planning in the urban growth area as time permits. Sub water sheds will be modeled to help identify future potential stormwater problem areas.

NORTH LAWRENCE DRAINAGE STUDY

After reviewing the North Lawrence Drainage Study (NLDS) the following overview outlines both short and long term recommendations with regards to current flooding and future development in North Lawrence. The NLDS has provided a list of recommended improvements totaling $41 million (2005 estimate). It is not fiscally possible to finance all of these recommended improvements at this time. Staff continues to work on incorporating the priorities identified in the NLDS with the city wide projects identified in the 1996 master plan. The executive summary of the NLDS lists the following four major recommendations which directly affect future development in North Lawrence.

- Ø *"Drainage from north of 24/40 Highway should be cutoff by the highway embankment and the water should be pumped over the levee at a point just east of the 24/40 intersection to reduce the burden on the 2nd Street Pump Station."*

- Ø *"Future developments in the watershed should maintain the current conveyance levels in the 100-yr floodplain – development should not reduce the capacity for floodplain storage."*

- Ø *"The City should purchase parcels of land as necessary for use as dedicated ponding area."*

- Ø *"Major roads and hydraulic structures should be improved to meet the current APWA criteria with regard to overtopping during the 100-year event, in order to provide adequate emergency services to the area."*

Relative to the first point, raising the 24/40 highway embankment west of US-59 would cut off the flow of water into the City from the north but at an estimated project cost of $24,802,000. It would be reasonable to let the development of the property north of 24/40 Highway dictate when this will take place and at least share in the cost. This same reasoning can be applied to upgrading the 2nd Street Pump Station and its downstream piping.

Staff concurs with the second recommendation regarding floodplain conveyance but takes exception to a related statement. The executive summary of the NLDS, states "*Due to the extensive hydraulic studies detailed in this report, it would not be necessary for developers to conduct individual studies, as long as the general*

recommendations of this study are followed (i.e. conveyance needs to be maintained with the floodplain)." Until recommended "Internal Systems" can be completed and are operational it is recommended that a Hydrologic & Hydraulic (H&H) Study continue to be a requirement for any future development located within the floodplain in North Lawrence. Additional development within the floodplain has the potential to raise the overall water surface elevation for surrounding properties resulting in property damage. The continued requirement of an H&H study will help to identify these situations. For areas outside the floodplain the report can serve as the H&H study on a site specific basis provided that current conveyance levels are maintained and that there is no net reduction in overall floodplain storage.

The third recommendation from the NLDS was the acquisition of land to pond stormwater. The SE corner of the intersection of 7th & Lyons is a candidate for such an acquisition. Currently the City of Lawrence owns the majority of this area. Property appraisals for the remaining two lots total $83,200 (April 2006). In addition to providing a ponding area, this location could also serve as a bio-retention basin which would address future water quality requirements by the Environmental Protection Agency; it would also provide a short term solution to a portion of the flooding this system now experiences. It is recommended that when future opportunities present themselves those areas for ponding should be acquired.

Total compliance with the fourth and final recommendation of improving major roads and hydraulic structures to meet the current APWA criteria will not be possible until construction of or improvements to pump stations north of 24/40, at 6th & Maple and on 2nd Street are complete. Refer to "NLDS Recommendations" memorandum dated February 16, 2007 for more specific details.

An important fact to remember during any system upgrade: "improvements are to generally be made in a downstream to upstream manner within the system, as there is no advantage trying to deliver more flow to a downstream component that cannot convey the existing flow."

LEVEE RECERTIFICATION

FEMA has mandated that the levee protecting North Lawrence be recertified by June 2009. Unfortunately no funding has been provided by either the US Army Corps of Engineers or FEMA to complete the process. The cost for recertification of the levee could be several hundred thousand dollars. Failing to meet the recertification process would remove the levee from flood insurance protection maps which would place North Lawrence in the flood plain. An extension of the deadline as well as funding sources for the recertification will need to be identified as soon as possible.

SUMMARY

It will not be possible to fund new stormwater capital improvement projects for the immediate future with double bond payments lasting through the end of 2009. In order to better identify and plan for future storm sewer maintenance, a comprehensive storm sewer infrastructure maintenance program will be developed. With regards to the North Lawrence Drainage Study (NLDS), staff recommends that development of the property north of 24/40 Highway dictate when NLDS recommendations take place and that developers at least share in the cost. Hydrologic & Hydraulic (H&H) studies will continue to be required for proposed future developments in the floodplain. For areas outside the floodplain the report can serve as the H&H study on a site specific basis provided that current conveyance levels are maintained and that there is no net reduction in overall floodplain storage. The City Commission will need to provide direction in 2007 & 2008 on a storm water capital improvement project prioritization blending the NLDS and the 1996 Master Plan. Identifying and acquiring funding for the recertification of the levee as soon as possible is critical particularly if an extension of the deadline cannot be extended.

	Principal	Interest	Total
2007	1,056,605	277,516	1,334,121
2008	1,029,848	235,240	1,265,088
2009	665,834	194,996	860,830
2010	561,886	169,853	731,739
2011	575,990	150,865	726,854
2012	592,375	132,224	724,600
2013	611,934	112,237	724,170
2014	631,519	91,159	722,678
2015	654,279	68,964	723,243
2016	679,182	45,289	724,472
2017	510,421	20,053	530,474
2018	21,515	861	22,376
	7,591,388	1,499,257	9,090,645