

# **Memorandum**

## **City of Lawrence**

### **Department of Public Works**

**TO:** David L. Corliss, City Manager  
**FROM:** Shoeb Uddin, City Engineer  
**CC:** Chuck Soules, Mark Thiel, David Woosley, Tammy Bennett  
**Date:** April 22, 2011  
**RE:** Budget Request  
Pavement Marking Improvement Program

#### **Introduction**

Pavement markings are integral part of the streetscape and play a very important role in channelizing and guiding the road users, including motorists, bicyclists and pedestrians. It is important to maintain the visibility and retro-reflectivity of pavement markings (especially on highly traveled and higher speed arterial streets and intersections) in order to ensure safe and efficient movement of people and goods.

Over the years, it has been a challenging task to provide adequate maintenance of pavement markings due to budget constraints. The current annual budget for pavement marking maintenance is only \$15,000.00. In order to keep up with the increasing maintenance needs, we need a substantial increase in Pavement Marking Maintenance Budget in Lawrence.

#### **Pavement Marking Need Summary**

Traffic Division staff recently conducted a city wide inspection / survey to assess the condition of the pavement markings in the city. The survey / inspection focused on arterial streets including the intersections on arterial streets (see Exhibit). In the future, we will make an assessment on the condition of pavement markings on collector streets. In general, pavement markings on local streets are not critical.

There are 3 suitable methods to install pavement markings on existing asphalt pavement – Paint, Pre-formed Thermo-Plastic and 3M A270. Paint is a cheaper option and will need to be done preferable twice a year (at a minimum once a year). However, it is a preferred solution for pavements scheduled for mill and overlay in the near future. Both Pre-formed thermoplastic and 3M A270 are durable and relatively longer lasting (approximately 3 to 5 years) material and are preferable where the existing asphalt surfacing is in good condition and is not scheduled for surface treatments (e.g. mill and overlay or micro-surfacing) within the life span of these materials. Pre-formed Thermoplastic and 3M A270 are comparable in price.

All 3 methods / materials mentioned above can be applied on concrete pavement as well. Since concrete does not require frequent surface treatment (similar to mill and overlay of asphalt surfacing), a durable and long lasting option is always preferable for concrete pavements.

Following is a priority list of locations where pavement marking is currently deficient, and are recommended for installation of new pavement markings.

<b>Priority Ranking</b>	<b>Location Mainline</b>	<b>Pre-formed thermoplastic / 3M 270</b>	<b>Paint (twice a year)</b>	<b>Comment</b>
1	Kentucky, 12 <sup>th</sup> to 19 <sup>th</sup>	\$10,000.00	\$2,250.00	
2	Tennessee, 6 <sup>th</sup> to 10 <sup>th</sup>	\$7,500.00	\$1,500.00	
3	9 <sup>th</sup> Street, New Hampshire to Tennessee	\$12,500.00	\$3,000.00	
4	19 <sup>th</sup> , Iowa to Naismith	\$6,500.00	\$1,500.00	
5	Wakarusa, 6 <sup>th</sup> to Harvard and 18 <sup>th</sup> to Clinton Parkway	\$35,000.00	\$8,000.00	
6	Clinton Parkway, Iowa to Crestline and Kasold to Hartford	\$7,500.00	\$1,250.00	
	<b>Mainline Total</b>	<b>\$79,000.00</b>	<b>\$17,500.00</b>	
	<b>Intersections</b>			
1	6 <sup>th</sup> and Wakarusa	\$15,000.00	\$6,000.00	
2	Wakarusa and Bob Billings	\$9,000.00	\$3,500.00	
3	Clinton Parkway and Wakarusa	\$15,000.00	\$6,000.00	
4	6 <sup>th</sup> and Kasold	\$15,000.00	\$6,000.00	
5	Kasold and Bob Billings	\$12,500.00	\$5,000.00	
6	Clinton Parkway and Kasold	\$15,000.00	\$6,000.00	
7	19 <sup>th</sup> and Iowa	\$12,500.00	\$5,000.00	
8	19 <sup>th</sup> and Naismith	\$6,000.00	\$2,500.00	
9	31 <sup>st</sup> and Iowa	\$12,500.00	\$5,000.00	
10	6 <sup>th</sup> and Folks	\$14,000.00	\$5,500.00	
11	6 <sup>th</sup> and Monterey	\$15,000.00	\$6,000.00	
12	6 <sup>th</sup> and Iowa	\$5,000.00	\$2,000.00	
	<b>Intersection Total</b>	<b>\$146,500.00</b>	<b>\$58,500.00</b>	

### **Future Funding Scenarios**

For mainline pavement markings, the cost differential between Paint and Pre-formed thermoplastic / 3M A270 seems inconclusive based on a life-cycle cost analysis. However, due to the higher initial cost associated with the durable options, Paint option seems more feasible for mainlines, at the beginning of a multi-year comprehensive program. Once all pavement markings are restored to an acceptable condition, durable methods / materials can be applied on mainlines if funds are still available.

At intersections, pavement marking installation is labor intensive due to the turning traffic, typically of higher volume. As a result, the price differential (for initial installation) between Paint and Pre-formed thermoplastic / 3M A270 is not as high compared to mainline installation. However, when compared on the basis of life cycle cost, Pre-formed thermoplastic / 3M A270 is certainly more cost effective. Therefore, a durable and long lasting option is always recommended at intersections, unless the intersection is scheduled for surface treatment in the immediate future.

Following are two hypothetical funding scenarios for consideration.

**1. Increase funding by \$50,000.00 annually**

Install pavement markings on mainlines (paint option):	\$17,500.00
Intersections (6 <sup>th</sup> and Wak, Wak and BB, Wak and Clinton) (Pre-Formed thermoplastic or 3M A270)	\$39,000.00
Total	\$56,500.00

If this level of funding is sustained, it will take at least 5 years to restore all deficient pavement markings on arterial streets (mainlines and at intersections) to an acceptable condition.

**2. Increase funding by \$100,000.00 annually**

Install pavement markings on mainlines (paint option):	\$17,500.00
Intersections (top 6 intersections listed in the table) (Pre-Formed thermoplastic or 3M A270)	\$81,500.00
Total	\$99,000.00

If this level of funding is sustained, all deficient pavement markings on arterial streets (mainlines and intersections) can be restored to an acceptable condition in 2 years. With continued funding at this level beyond the first 2 years, we will be able to restore pavement markings on Collector streets, in addition to maintaining the markings on arterial streets.

### **Conclusions and Recommendations**

Based on the two funding scenarios outlined above, it appears that an increased funding of \$100,000.00 per year (for at least 3 years) will effectively address the current deficiencies in pavement marking (on all arterial and collector streets, including intersections) throughout the city. After the 3<sup>rd</sup> year, funding for pavement marking could go down to about \$50,000.00 per year in order to continue providing proper maintenance of pavement markings in the city. It is important to note, as we address existing deficiencies, there will be

**Alternatively**, attached is a truck mounted paint unit that staff could operate to maintain the mainline pavement markings annually. The equipment would cost approx \$50,000 and the current \$15,000 / year budget could be used for paint materials. This option would tie up 2 employees for about a month each year but the City's pavement markings could be kept up to an acceptable level.