



## MEMORANDUM

**TO: Mayor Laurel Lunt Prussing and Members of the City Council**

**FROM: William R. Gray, P.E., Public Works Director  
Richard T. Coyne, Operations Manager  
Larry S. Fredrick, Fleet Manager**

**DATE: September 24, 2009**

**RE: Tandem Axle Truck and EPOKE Spreader System Purchase**

### **Introduction**

Public Works Staff is proposing to purchase a tandem axle truck and an EPOKE Salt Spreading System. The truck will replace one of the single axle trucks that are budgeted for replacement this fiscal year. The EPOKE Spreader System is a unique system that is capable of spreading liquid or salt by itself or both at the same time. It holds 650 gallons of liquid and 7 tons of salt. The system is designed to fit in a tandem axle truck and is capable of pre-wetting the primary and secondary streets before a snow plowing event. The EPOKE system and the tandem axle truck will save money and has environmental benefits. The tandem axle truck would be used year around and will reduce the number of trips for hauling to and from job sites. The benefits for both the tandem axle truck and the EPOKE spreader system are explained in detail on the attached memo.

### **Fiscal Impacts**

The tandem axle truck would cost an additional \$12,000 above the replacement cost of a single axle truck. The EPOKE System has a cost of \$88,000. Both would be funded from the CIP fund that is available due to unspent monies not needed to cover overages in the Operations Division's budget for pavement maintenance materials and savings from recent bids. The Operations Division has been able to save money primarily from having the capabilities to perform jobs in house and not having to hire a contractor to do the work. (Please see the attached Budget Amendment Ordinance).

### **Recommendation**

It is recommended that "An Ordinance Approving and Authorizing a Budget Amendment for the Purchase of this Equipment" be approved.

Attachment: Detailed Request for Equipment  
Ordinance



## MEMORANDUM

**TO:** Mayor Laurel Lunt Prussing  
Ron Eldridge, City Comptroller

**FROM:** William R. Gray, Public Works Director  
Rich Coyne, Operations Manager  
Larry Fredrick, Fleet Manager

**DATE:** August 27, 2009

**RE:** Tandem Axle Dump Truck & EPOKE Salt Spreading System Purchase

### Introduction

Public Works staff is proposing to purchase a tandem axle dump truck and an EPOKE Salt Spreading System. This truck would replace one of the six dump trucks that are scheduled and budgeted for replacement in FY09/10. The additional cost of a tandem dump truck would be approximately \$12,000. The EPOKE salt spreading system would cost \$88,000. This system would be fitted onto the tandem dump truck. Salt spreaders would be purchased for the remaining five dump trucks at a cost already budgeted. Cost savings predicted below will offset the additional **\$100,000** upfront cost.

In addition to the predicted costs savings, there will be environmental benefits. Public Works will be reducing the amount of salt that will provide for healthier streams, reduce the salt spray that harms right-of-way vegetation and also reduce the amount of fuel consumption thereby reducing diesel fuel emissions. These benefits are difficult to quantify, yet they add an intrinsic value to our environment.

This tandem axle dump truck would be used year-round for snow and ice control in the winter and general operations work and hauling during the remainder of the year.

### Fuel Savings

Even though the tandem axle dump truck will use more fuel because of its larger engine, it has a 50% larger dump capacity (12 cubic yards versus 8 cubic yards), which would result in fewer trips to the waste transfer station, recycling station, and the cold asphalt patch supplier. The tandem axle dump truck would make two trips for every three trips made by a single axle dump truck. Typically, a single axle dump truck would make 400 trips annually when assigned to the concrete crew. With a larger capacity truck, the in-town trips would be reduced by 133. Each trip uses approximately 1.5 gallons of fuel. The savings for in-town trips would be 200 gallons of fuel per year. This truck would also go to Decatur to pick up cold asphalt patch about 12 times per year. The number of trips would be reduced by 1/3 resulting in 9 trips and a savings of 150 gallons of gas per year. These fuel savings reflect the miles per gallon for each vehicle.

As part of the snow fighting equipment, the tandem axle truck would be used to perform initial snow and ice control. The vehicle would be able to reduce the number of trucks called for the first round of brine application prior to a predicted event. This system would allow fewer trucks to be used to pre-treat the streets before the event. This treatment would be done in advance of a snow event resulting in fuel savings, but the savings would depend upon each storm event. Typically, the city has seven major winter events (events with two or more inches of snow). With the EPOKE system, one treatment during a major winter event could be eliminated. This would result in fuel savings of 126 gallons of fuel per major winter event.

Fuel savings resulting from the replacement of one single-axle dump truck with a tandem axle dump truck and the use of the EPOKE salt spreading system would be 350 gallons during normal operations and 882 (7 events x 126 gallons saved per event) gallons for snow and ice control. The annual diesel fuel savings would be **\$3696** @ \$3 per gallon, \$4928 @ \$4 per gallon, and \$5544 @ \$4.50 per gallon.

The tandem axle truck and EPOKE system will cost about **\$1000** per year more in operation and maintenance costs as determined by the Fleet Manager based on the fact the vehicle will have extra tires, axle, and use more fuel.

### **Salt Savings**

Studies have shown that you can lose up to 30 percent of salt off the roadway when it is applied dry from scatter, bounce and traffic. Using salt along with liquid brine or calcium chloride reduces salt scatter to 4 percent. With the EPOKE salt spreading system, road salt and liquid brine will be used for snow and ice control. The EPOKE system will be able to spread liquid brine on the street surface prior to the event requiring less salt usage during and following the event. The improved accuracy of the spreader allows the operator to effectively direct the salt brine so less will go into the storm sewer system or collect in one area on the street. On four-lane roadways, the truck would be able to cover two lanes in one trip with liquid brine. Under the current system, a four-lane roadway would require four trips to treat for snow and ice control.

When checking references with entities that already have an EPOKE system they are reporting savings of 30 to 50 percent. The comparison below is for pre-treatment of roadways when a prediction of storms with 2 or more inches and plowing will occur. In this case the pavement is pretreated to form a bond and reduce the snow and ice buildup sticking to the pavement. Currently when pre-treating with salt only a loss of up to 30% of the material from scatter and bounce will occur. Using the EPOKE system to pre-treat using straight liquid brine will adhere to the pavement in a uniform manner with little or no waste. The EPOKE also has the ability to cover 2 lanes with one pass which reduces the number of passes made and saves on fuel.

Below is a comparison of pre-treating the primary and secondary routes using granular salt versus straight liquid brine before a storm of two or more inches is predicted. This cost is based on each event. Currently crews average about 30 tons of salt for 160 lane miles of primary and secondary routes per treatment. Using last year's prices of \$65 per ton for salt yields a cost of \$1,950 for pre-treating the primary and secondary routes. Using the EPOKE estimating 40 gallons of liquid brine per lane mile, at 20 cents per gallon, the cost would be \$1,280. That would be a savings of \$670 per event. A typical winter averages 8 plowing events per year so this could be a savings of **\$5,360** per year.

<b>Pre-Salting No Liquid</b>	<b>Pre-Wetting with EPOKE</b>
30 tons of granular salt @\$65 per Ton	No granular salt just Liquid Salt Brine
Total Cost \$1,950	Used at a rate of 40 gal per Lane Mile
	Total Cost @\$.20 per Gallon
	\$1,280 per event when pre-wetting

Public Works also pre-treats the residential routes before plowing occurs. There are 15 residential routes and each route averages about one ton of granular salt usage per route when pre-treating, so 15 tons of granular salt for all the residential routes at \$65 per ton = \$975 per event. With the EPOKE and using straight liquid brine at approximately 187 gallons per route at 20 cents per gallon, the cost would be \$561 per route, a \$414 savings per event. Averaging eight events of plowing per year this would be a savings of **\$3,312** per year. Taking the primary, secondary, and residential routes together using the EPOKE system there would be a savings of about **\$8,672** per year in pre-treatment cost.

Technology has improved with the basic system and the liquid tanks have increased in size to hold more liquid, however the system used on the single axle trucks do not have the ability to apply the liquid in the same manner as the EPOKE and would have to make more than one pass. The plan is to use liquid brine with granular salt on all the routes after the initial pre-treating. Without the EPOKE crews would not be able to pre-treat with straight liquid, but would use liquid with salt to help reduce the loss from scatter and bounce. There would be a reduction in the rate of granular material per lane mile but it would not be a significant savings. What the savings would be is hard to predict without actually having the equipment to use this method.

In summary the estimated cost savings of purchasing a tandem dump truck with the EPOKE system is **\$11,368** per year. The return on investment (ROI) would be just under nine years. Epoke spreaders are painted with a multi-stage primer and paint process that is baked on for durability and only stainless steel fasteners are used to minimize corrosion. The spreader is warranted against rust through for 10 years and a 15 year parts availability guarantee will ensure that we can use this spreader on the next chassis. The tandem axle truck would be scheduled for replacement in twelve years. Assuming the EPOKE system would continue to be used for the next truck purchase in twelve years, the ROI would be fewer than nine years.

ORDINANCE 2009-09-107

AN ORDINANCE REVISING THE ANNUAL BUDGET ORDINANCE  
(Public Works Dump Truck and Salt Spreader)

WHEREAS, the Annual Budget Ordinance of and for the City of Urbana, Champaign County, Illinois, for the fiscal year beginning July 1, 2009, and ending June 30, 2010, (the "Annual Budget Ordinance") has been duly adopted according to sections 8-2-9.1 et seq. of the Illinois Municipal Code (the "Municipal Code") and Division 2, entitled "Budget", of Article VI, entitled "Finances and Purchases", of Chapter 2, entitled "Administration", of the Code of Ordinances, City of Urbana, Illinois (the "City Code"); and

WHEREAS, the City Council of the said City of Urbana finds it necessary to revise said Annual Budget Ordinance by deleting, adding to, changing or creating sub-classes within object classes and object classes themselves; and

WHEREAS, funds are available to effectuate the purpose of such revision; and

WHEREAS, such revision is not one that may be made by the Budget Director under the authority so delegated to the Budget Director pursuant to section 8-2-9.6 of the Municipal Code and section 2-133 of the City Code.

NOW, THEREFORE, BE IT ORDAINED BY THE CITY COUNCIL OF THE CITY OF URBANA, ILLINOIS, as follows:

Section 1. That the Annual Budget be and the same is hereby revised to provide as follows:

FUND:	Capital Improvement and Replacement Fund	
ADD EXPENSE:	PW Dump Truck/Salt Spreader	\$100,000
REDUCE:	Fund Balance	\$100,000
FUND:	General Fund	

INCREASE EXPENSE:        Transfer V.E.R.F.                \$10,000  
REDUCE:    Fund Balance                                        \$10,000

Section 2. This Ordinance shall be effective immediately upon passage and approval and shall not be published.

Section 3. This Ordinance is hereby passed by the affirmative vote of two-thirds of the members of the corporate authorities then holding office, the "ayes" and "nays" being called at a regular meeting of said Council.

PASSED by the City Council this \_\_\_\_\_ day of \_\_\_\_\_,  
\_\_\_\_\_.

AYES:

NAYS:

ABSTAINED:

\_\_\_\_\_  
Phyllis D. Clark, City Clerk

APPROVED by the Mayor this \_\_\_\_\_ day of \_\_\_\_\_,  
\_\_\_\_\_.

Laurel Lunt Prussing, Mayor

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