

PUBLIC WORKS MEMORANDUM
No. 2019-29

DATE: April 26, 2019

TO: Honorable Mayor Moore Wolfe and City Council Members

FROM: Scot Wrighton, City Manager
Matthew C. Newell, P.E., Public Works Director

SUBJECT: Motion to Approve the Proposed 2019 Local Motor Fuel Tax Street Project
Street List and Other Expenditures
City Project 2019-25

SUMMARY RECOMMENDATION:

Since the details of the 2019 Street Improvement Program were not included in the 2019 municipal budget approved by the City Council, it is recommended that these details be approved, by motion, on May 6. In the future, the Public Works Department will prepare a detailed 5-Year street plan as a part of the annual budget process so governing body members will be able to review which street improvements are planned, and for which year, during budget deliberations.

The proposed 2019 street program includes recommended street sections, and “alternate” street sections. Alternate street sections are ones that do not score quite as high, but some of these could be improved if bids come in below the engineer’s estimate. Alternate street sections are also the most likely ones, based on pavement conditions, that could be switched-out for recommended street sections if, in the opinion of the City Council, one or more alternate street sections warranted improvement ahead of the recommended sections.

Finally, the 2019 street program includes the purchase of equipment that will enable the Public Works Department to make maintenance repairs that bond with existing street surfaces more effectively and last considerably longer than existing street patching methods.

It is recommended by staff that the City Council approve by motion the following items:

1. The proposed street list for the 2019 Local Motor Fuel Tax Street Improvement Project.
2. The authorization for staff to specify and bid the purchase of a spray injection patch machine to assist in providing long term pothole repairs.

PRIOR COUNCIL ACTIONS:

The 2019 Capital Improvements Plan includes an allocation of funds for this project.

BACKGROUND:

Street Determination Process

The City Public Works staff inspects half of the City’s streets each year. These inspections assign a rating number to each block of every City maintained street, called a Pavement Condition Index (PCI). The PCI rating is a number between 0 and 100 that is based on the various pavement distress features present on each street. This information is maintained in a database using software specifically designed to inspect and manage street condition.

General Rating	Pavement Condition Index (PCI)
Excellent	90-100
Good	80-90
Fair	70-80
Poor	60-70
Very Poor	50-60
Fail	0-50

Table 1. Pavement Condition Index

The yearly capital improvement list generally focuses on City streets with a PCI rating of less than 75. Roughly 41% of the City’s streets fall below this rating. The City’s overall street condition is graphed in Figure 1. The graph shows that over the past 6 years the overall condition of the City’s streets has declined from an average PCI score of 82 to a current average score of 78.

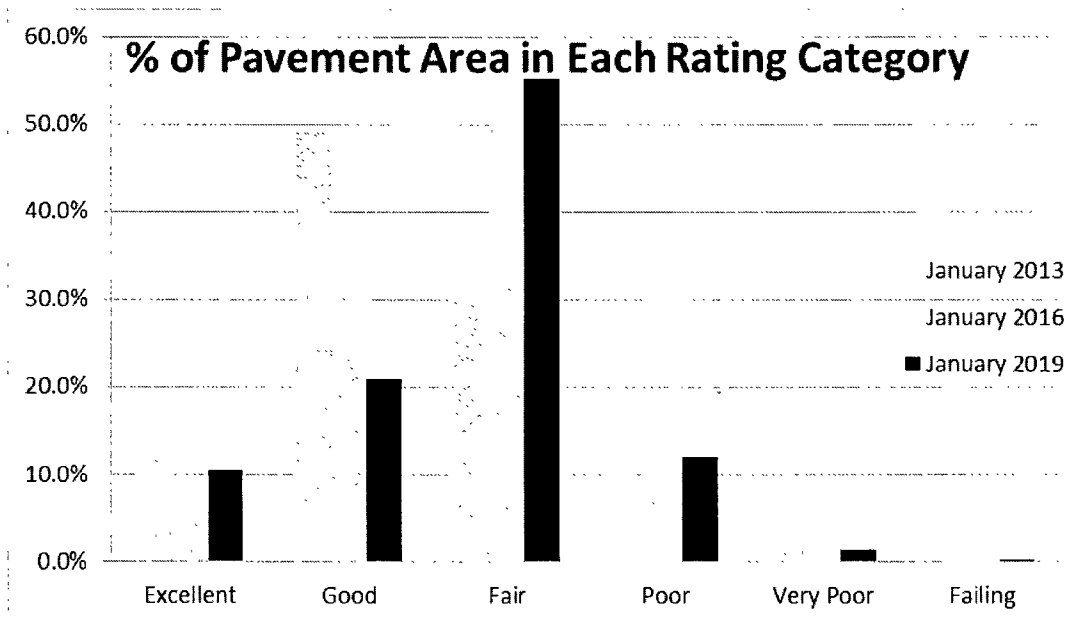


Figure 1. Pavement Condition from 2013 to 2019

The City Council has directed that Local Motor Fuel Tax funds be used on residential streets using a “worst first” improvement approach. Public Works staff uses the street database program to help identify those streets that are worst in the City. Since there are more “worst first” streets identified

than can be done with the available funding, staff uses the following information to refine the list and determine the recommended streets each year.

1. Residential vs. non-residential. Staff generally uses State Motor Fuel Tax funds on streets that are mostly non-residential and uses City Motor Fuel Tax funds on streets that are mostly residential or have a significant residential nature to them.
2. Traffic volume on the street. Lower traffic volumes generally mean a slower deterioration of the street, meaning that the street with a lower traffic volume can often be deferred if needed.
3. Future work. We will recommend holding off on a street if future water main, sewer, storm drainage or other construction work is planned that will potentially damage the new street surface.
4. Complicating issues are identified. Occasionally during the initial design review, complicating issues are identified that will take more design work which could cause a project delay. If we identify additional work that is needed such as a significant intersection design, accessibility work, storm drainage, etc., we will defer the street to allow time for that work to be designed and completed either separately or as part of the project.
5. Too costly. Some streets are deferred because they are too costly to repair within available funding. Many brick streets and some concrete streets fall into this category. If it is the desire of residents that a brick street remain brick, the costs for repair or improvement will often exceed available funding.
6. Asphalt streets generally take precedence. In general, concrete and brick streets deteriorate much slower than asphalt. An asphalt street's condition can change drastically from one year to the next. We don't normally see these wide swings in the condition of concrete or brick streets.
7. Ongoing maintenance requirements. We consult with the City's maintenance crews on which streets are proving too taxing on their manpower and materials or they do not have the necessary equipment to adequately maintain a street.
8. Proximity. Occasionally we will propose to add some blocks that are not "worst first" into a project that is working on adjacent blocks in order to keep the street at the same condition and not require a second project 2 or 3 years later to pick up the extra blocks that were skipped. Since each block is rated separately, they all tend to have different ratings. We will try to group blocks together rather than end up with a quilt pattern of improved and unimproved streets.

Three years ago, when the City Council approved a Local Motor Fuel Tax to help fund additional street repairs, the Council also approved a \$7.5 million loan to give an initial "kick start" to the City's street improvement program. At the time Council implemented the Local MFT, the Pavement Condition Index was in a steep decline from a high of 87 in 2007, to nearly 79 in 2015. As detailed on Figure 2, the past 3-year, \$7.5 million boost appears to have stopped the free fall, temporarily stabilizing the City's PCI at nearly 78.

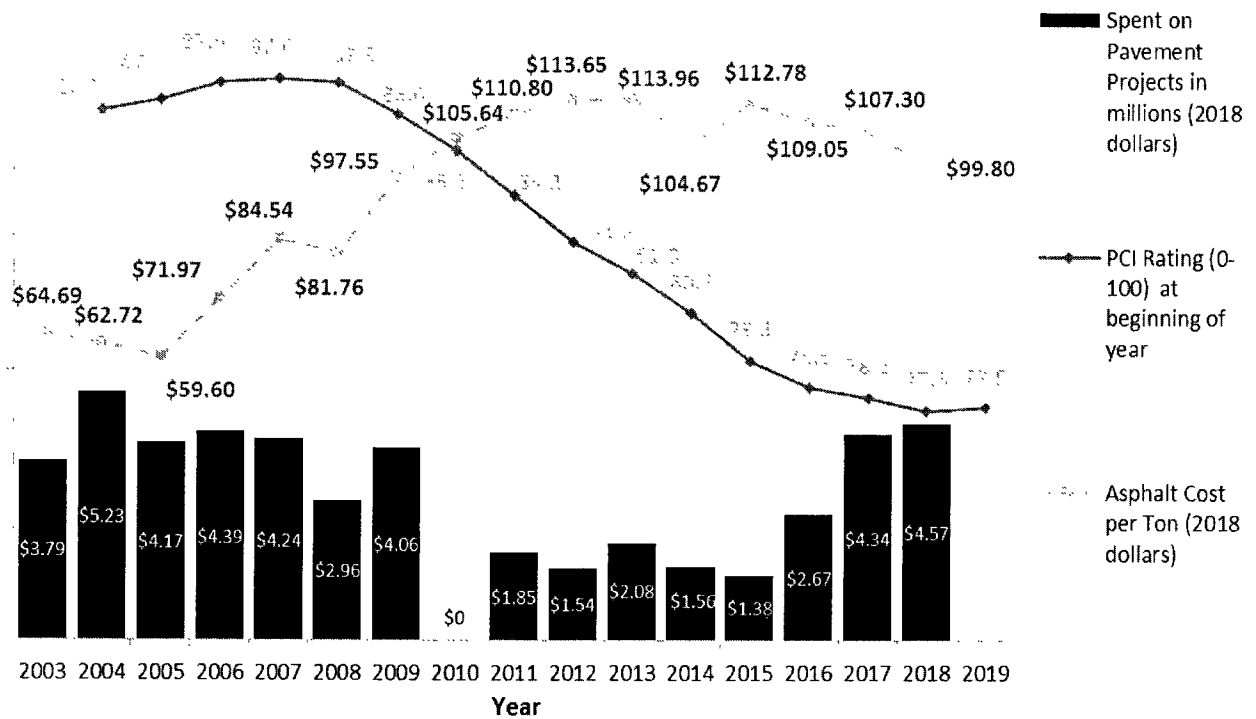


Figure 2. Pavement Condition vs. Funding

The loaned funds have now been expended and the Local Motor Fuel Tax funding will be significantly reduced over the coming years as the loan is paid off. Table 2 outlines the 5-year funding estimation allocated in the 2019 Capital Improvement Plan approved by the City Council.

Fiscal Year	Anticipated Funding
2019	\$1,500,000
2020	\$1,000,000
2021	\$600,000
2022	\$600,000
2023	\$600,000

Table 2. Local MFT 5-Year Funding Plan

2019 Local Motor Fuel Tax Street List (See Figure 3 attached)

The proposed 2019 Local MFT project is identified on Table 3. The main street on the project is proposed to be Wood Street between Jasper Street and 22nd Street. Wood Street has nearly 80 partial lead water services which will need to be replaced as part of the project. With the water main in the center of the street, the water service work will require the closure of portions of Wood Street to be closed to all traffic as water services are replaced.

Pavement Type	Description	Length (ft)	Maintenance Type	Est. Total Cost
Asphalt	E CENTRAL AV, END OF STREET to N WARREN ST	500	Mill & Overlay	\$220,000.00
Asphalt	N WARREN ST, E CENTRAL AV to E KING ST	355	Mill & Overlay	\$44,000.00
Asphalt	E DIVISION ST, N 34TH ST to N 35TH ST	430	Reconstruction	\$63,000.00
Asphalt	E WOOD ST, S JASPER ST to S 22ND ST	3888	Mill & Overlay	\$700,000.00
			Utilities	\$367,000.00
Miscellaneous				
Asphalt	N MLK JR DR, WABASH CROSSING		Turn Lane and Patching	\$80,000.00
Asphalt	E WOOD ST, N MLK JR DR to N MAFFIT ST		Patches	\$100,000.00
Asphalt	BAYVIEW, COUNTRY MANOR, LAKERIDGE, and BAKER WOODS NEIGHBORHOODS		Patches	\$200,000.00
			Contingency	\$50,000.00
Estimated Total Street Cost (budget = \$1.4 million LMFT Fund)				\$1,457,000.00
Est. Total Utility Cost (Storm Fund, Sewer Fund, Water Main Repl. Fund)				\$367,000.00
Estimated Total 2019-25 Project Cost				\$1,824,000.00
Alternate Streets				
Asphalt	N OAKLAND AVE, ELDORADO ST to LEAFLAND AVE	2684	Mill & Overlay	\$410,000.00
Asphalt	W LEAFLAND AVE, N OAKLAND AVE to N VAN DYKE ST	1286	Mill & Overlay	\$25,000.00
Asphalt	E WELLINGTON WAY, N PORTAGE PL to N WOOFORD ST	981	Mill & Overlay	\$42,000.00
Asphalt	E DECATUR ST, MLK JR DR to MAFFIT ST	1303.4	Mill & Overlay	\$87,000.00
Asphalt	E DIVISION ST, N 24TH ST to N 27TH ST	1326	Mill & Overlay	\$45,000.00
Asphalt	N 33RD ST, E DIVISION ST to E FARIES PKWY	1300	Mill & Overlay	\$50,000.00

Asphalt	N 33RD ST, S LAKE SHORE DR to E WILLIAM STREET RD	2160	Mill & Overlay	\$105,000.00
Asphalt	N 34TH ST, E PRAIRIE ST to E WILLIAM STREET RD	1365	Mill & Overlay	\$68,000.00
Asphalt	N 35TH ST, E PRAIRIE ST to E WILLIAM STREET RD	1164.4	Mill & Overlay	\$69,000.00
Asphalt	E ELDORADO ST, N 33RD ST to N LAKE SHORE DR	973	Mill & Overlay	\$40,000.00
Asphalt	E PRAIRIE ST, END OF STREET to N 35TH ST	986	Mill & Overlay	\$25,000.00
Estimated Total Alternate LMFT Projects Cost				\$966,000.00

Table 3. 2019 Proposed Street List with Alternates

Some of the alternate streets will be included in the bid package to add to the project if favorable bids are received, otherwise they will be included in future annual projects.

Pothole Patching

The cost of pothole patching varies from year to year depending on the weather. Potholes are formed by water getting into the pavement and freezing. When warm weather arrives after a hard freeze, potholes begin to bloom throughout the City. Table 4 shows the City’s cost for pothole patching for the last three years:

Task	Year			
	2016	2017	2018	2019
Equipment	\$21,002	\$17,249	\$26,896	\$14,498
Labor	\$214,220	\$181,472	\$316,390	\$169,038
Material	\$36,477	\$23,234	\$53,591	\$22,925
Total	\$271,699	\$221,955	\$396,877	\$206,461

Table 4. Pothole Patching Costs

Pothole patching occurs under all weather conditions. Most of the work is “throw and go”, meaning the crew throws a shovel full of asphalt into the hole and moves on. This is not the best way to patch potholes but is often the only way to patch a large number of potholes in a short amount of time. Because of the time constraints when the “pothole bloom” is upon us, we will never fully get away from the throw and go method of patching.

As funding for street improvements decreases, the City’s ability to provide a better pothole patching method is becoming increasingly critical to our ability to maintain a safe and reliable street system. Over the past year, the Public Works Department has researched patching systems to determine a way to provide a higher quality, long lasting patch at less cost and at a high rate of productivity.

The spray injection patching process has been identified as a leading method to provide a long-lasting patch with a rapid application rate. The spray patching process involves removing water and debris from the patch area, spraying on a tack coat of hot asphalt, blowing hot asphalt coated aggregate into the patch area. This method is successfully used by the Illinois Department of

Transportation and has been shown to provide a high-quality patch that will last significantly longer and can be installed at a very good rate of application. Testing performed by other transportation departments have borne this out.

A spray injection patching system has the potential to save the City \$20,100 annually in productivity and materials costs over traditional patching. Costs are further reduced by reducing the number of times a street needs to be patched. For instance, the City patches many of the major streets multiple times over the course of a season: Jasper-23 times, Martin Luther King-28 times, MacArthur-10 times. When a more permanent patch is placed, these repeat trips will effectively end, or be significantly reduced. If the system works for the City as anticipated, it may be beneficial to add additional spray patch units to the fleet in coming years.

The estimated cost for a spray patching system will be around \$100,000 for a trailer mounted applicator and an emulsion tank. Typical spray patching machines from different vendors are attached for Council's information. It is staff's recommendation, that in a time of increased budget pressure for pavement maintenance, the City would be better served by acquiring an improved repair system to maintain its pavements than to overlay one additional street this year. The City's ability to perform long lasting patches will ultimately improve the overall condition of the City's street system by slowing deterioration and enabling the Department to catch and strengthen pothole prone areas before they fall apart.

SCHEDULE:

The Local MFT Street Improvement Project is planned to be advertised within the next two weeks. Work is planned to begin in July with an early fall completion.

If the spray patching machine is approved, staff will prepare bid specifications with the intention of bringing a machine to Council for purchase approval within the next 3-4 months.

BUDGET/TIME IMPLICATIONS:

Budget Impact: Funding for this project is allocated in the Local Motor Fuel Tax Fund.

Staff Impact: Staff has allocated time to manage this project.

POTENTIAL OBJECTION: There are no known objections.

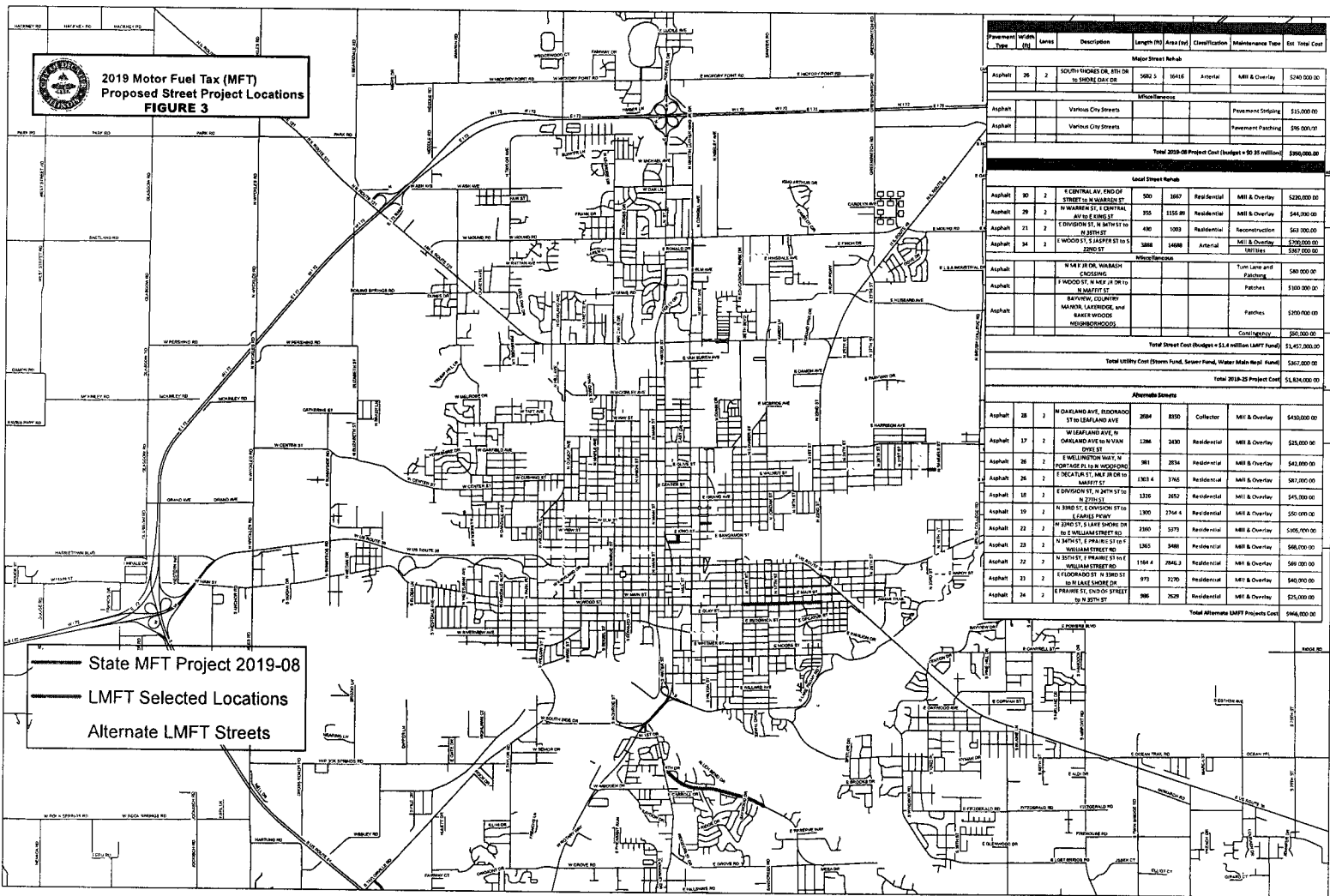
INPUT FROM OTHER SOURCES: None

STAFF REFERENCE: Matt Newell, Public Works Director. Matt will be in attendance at the City Council meeting to answer any questions of the Council on this item.

LEGAL REVIEW: Not applicable.

Attach: 2

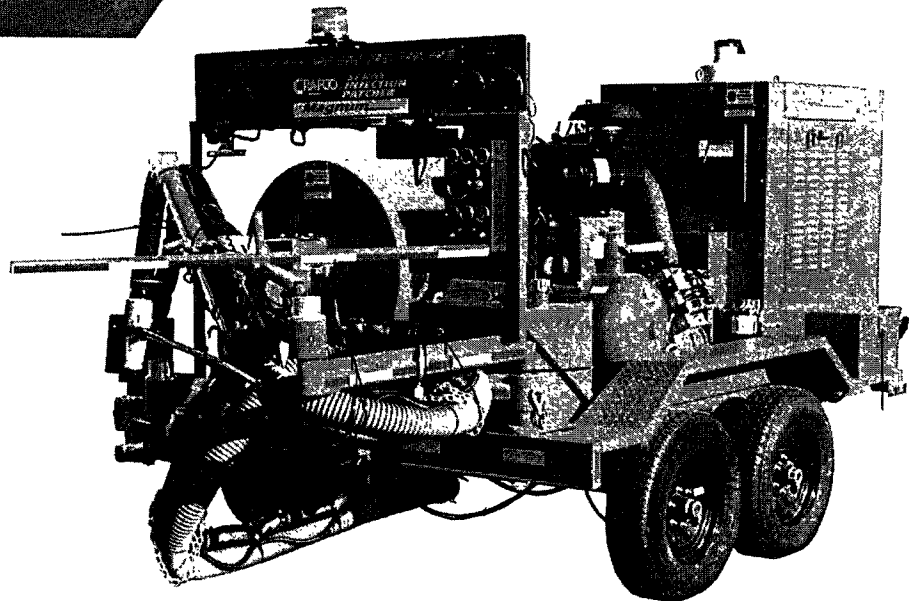
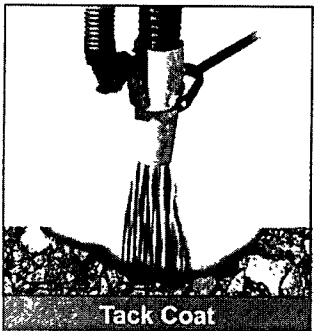
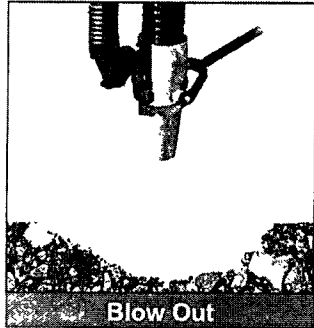
**2019 Motor Fuel Tax (MFT)
Proposed Street Project Locations
FIGURE 3**



Item No.	Length (ft)	Area (sq ft)	Description	Classification	Maintenance Type	Est. Total Cost
Major Street Rehab						
Asphalt	26	2	SOUTH MOORE DR. STR. DR. to MOORE DR. CR.	Arterial	MMI & Overlay	\$240,000.00
Miscellaneous						
Asphalt			Various City Streets		Pavement Overlay	\$15,000.00
Asphalt			Various City Streets		Pavement Patching	\$16,000.00
Total 2019-08 Project Cost (Budget = \$2.91 million)						
\$296,000.00						
Local Street Rehab						
Asphalt	30	2	E CENTRAL AV. END OF STREET to N HARRIS ST.	Residential	MMI & Overlay	\$226,000.00
Asphalt	29	2	N WARREN ST. & CENTRAL AV. to E CONG ST.	Residential	MMI & Overlay	\$44,000.00
Asphalt	21	2	E DIVISION ST. to N 34TH ST. to N 37TH ST.	Residential	Reconstruction	\$63,000.00
Asphalt	34	2	E WOODS ST. S. LAFFER ST. to S END ST.	Arterial	MMI & Overlay	\$170,000.00
Miscellaneous						
Asphalt			N 14TH ST. DR. W. BASH COSSING		Turn Lane and Patching	\$80,000.00
Asphalt			E WOODS ST. N. 14TH ST. DR. to N 16TH ST.		Patching	\$100,000.00
Asphalt			BARNEY, COLONY, MANOR, LAFFER, and BARKWOOD WOODS		Patches	\$100,000.00
Contingency						
\$60,000.00						
Total Street Cost (Budget = \$1.6 million LMFT Fund)						
\$1,457,000.00						
Total Utility Cost (Storm Fund, Sewer Fund, Water Main Rep. Fund)						
\$167,000.00						
Total 2019-20 Project Cost						
\$1,624,000.00						
Alternate Streets						
Asphalt	28	1	N OAKLAND AVE. REDORADO ST. to LEAFLAND AVE.	Collector	MMI & Overlay	\$410,000.00
Asphalt	17	1	W LEAFLAND AVE. to W OAKLAND AVE. to VAN DYKE ST.	Residential	MMI & Overlay	\$19,000.00
Asphalt	26	2	E WASHINGTON WAY. N 10TH ST. to N 12TH ST. to N 14TH ST.	Residential	MMI & Overlay	\$43,000.00
Asphalt	26	2	E DECATUR ST. N. 14TH ST. DR. to N 16TH ST.	Residential	MMI & Overlay	\$87,000.00
Asphalt	18	2	E DIVISION ST. N. 14TH ST. to N 17TH ST.	Residential	MMI & Overlay	\$45,000.00
Asphalt	19	2	3900 ST. DIVISION ST. to LEAFLAND AVE.	Residential	MMI & Overlay	\$51,000.00
Asphalt	22	2	N 2ND ST. S. LAFFER ST. DR. to N WILLIAM STREET DR.	Residential	MMI & Overlay	\$105,000.00
Asphalt	23	2	N 34TH ST. E. PRAIRIE ST. to N WILLIAM STREET DR.	Residential	MMI & Overlay	\$68,000.00
Asphalt	22	1	N 35TH ST. E. PRAIRIE ST. to N WILLIAM STREET DR.	Residential	MMI & Overlay	\$69,000.00
Asphalt	23	2	E DIVISION ST. N. 14TH ST. to N 16TH ST.	Residential	MMI & Overlay	\$40,000.00
Asphalt	24	2	E PRAIRIE ST. DIVISION ST. to N 20TH ST.	Residential	MMI & Overlay	\$25,000.00
Total Alternate LMFT Projects Cost						
\$946,000.00						

— State MFT Project 2019-08
 — LMFT Selected Locations
 - - - Alternate LMFT Streets

Magnum™ Spray Injection Patcher



Crafco's Magnum Spray Injection Patcher effectively repairs a wide variety of pavement conditions including potholes, deteriorated shoulders, utility cuts, fissures, and alligator cracked areas. The Magnum Spray Injection Patcher's integrated operation cleans the area to be repaired, applies a tack coat, coats the aggregate with asphalt emulsion and then applies the mixture, all in one easy continuous operation. Using high velocity air in conjunction with screw auger, the coated aggregate material is compacted during application, leaving virtually no voids in the final pavement repair, and making a long lasting patch that is superior to conventional methods as proven by government studies. The Magnum will place over seven tons per hour. The aggregate material for the trailer mounted Magnum is supplied from a dump truck that is equipped with a live tailgate, which provides a uniform material supply for uninterrupted production. A counterbalance folding boom sweeps a 360° arc that extends 18 ft (5.5 m) from the back of the unit covering an unprecedented **1,275 square foot (118 square meters) work area**. All controls are positioned at the operators' fingertips giving the operators complete control. The Magnum Spray Injection Patcher features a "maintenance free" emulsion feed line and a machined aluminum application nozzle, which contains an **internal pressurized spray ring that assures 100% coating of the aggregate while using far less emulsion**. Crafco Magnum Spray Injection Patchers give you complete control of pavement preservation, from the smallest repair to the largest, quickly, effectively and efficiently.

Attachment 1-1

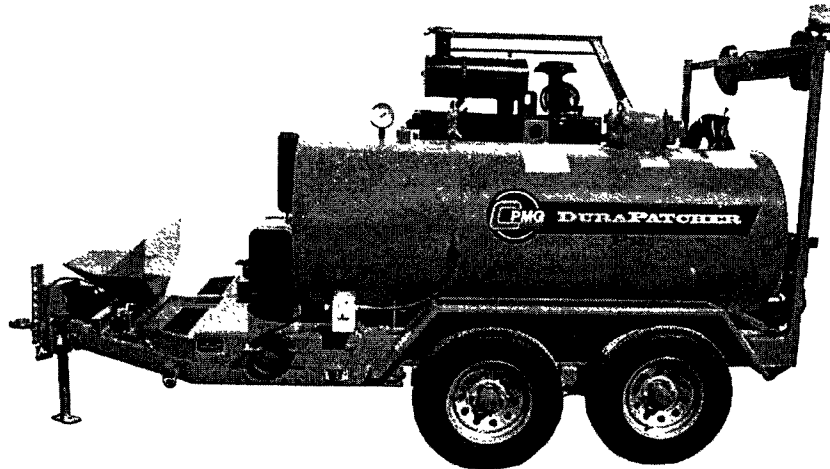
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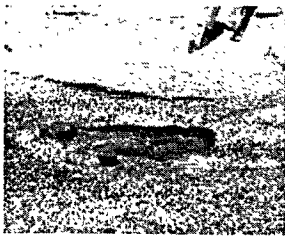
**INNOVATION
IN PRESERVATION**

P2



A Permanent Patch in 4 Easy Steps:

Patch in almost any weather conditions and eliminate labor-intensive, poor performing patches with the DuraPatcher 4 step process.



1. Clean:
Use high volume low pressure air to clean the patch of debris.



2. Tack:
Prep the patch with a coating of emulsion.



3. Fill:
Inject emulsion coated aggregate and fill pothole.



4. Coat:
Apply a light coating of clean aggregate and open to traffic.

Low Maintenance/Hi-Performance:

The DuraPatcher air-driven system utilizes virtually no moving parts in the delivery system. No augers, conveyors or other wear parts are required making it the most reliable in the industry. Aggregate is gravity fed from the tow vehicle completing the worry-free package. The system will deliver aggregate up to 2.5 inches in diameter without plugging or adjustment.

Ergonomic No-Stress Boom:

The 3 piece boom design provides the ultimate in support for the operator moving the delivery hose. The boom/slide system easily moves throughout the entire 18-foot working radius allowing for smooth patching anywhere in the work zone.

Vent-Flo Nozzle:

The specially designed Vent-Flo nozzle properly coats the aggregate with the right amount of emulsion regardless of aggregate size. The mix is applied at an angle to the repair allowing maximum placement and best operator safety. The vent holes diffuse/slow down the air stream to minimize rock overspray and maximize placement into the repair.

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Spray Patcher Street Max™

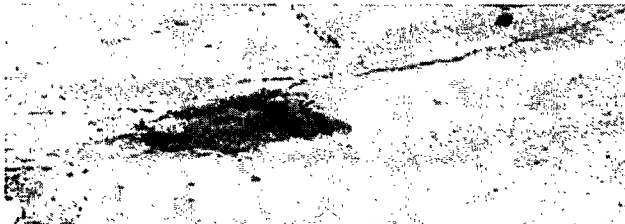
Emulsion Heating System: During Operation engine coolant keeps the emulsion at, or near 150 degrees. Can patch in cold temperatures.

Mix on Demand: Eliminates the end users dependency of commercially premixed materials

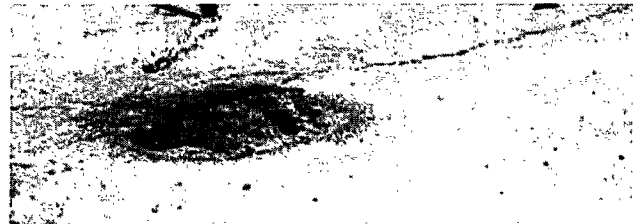
Modular Componentry: Reduced Repair time, and cost of ownership

Optional Pothole Vacuum: Cleans out wet or dirty potholes for better quality patch

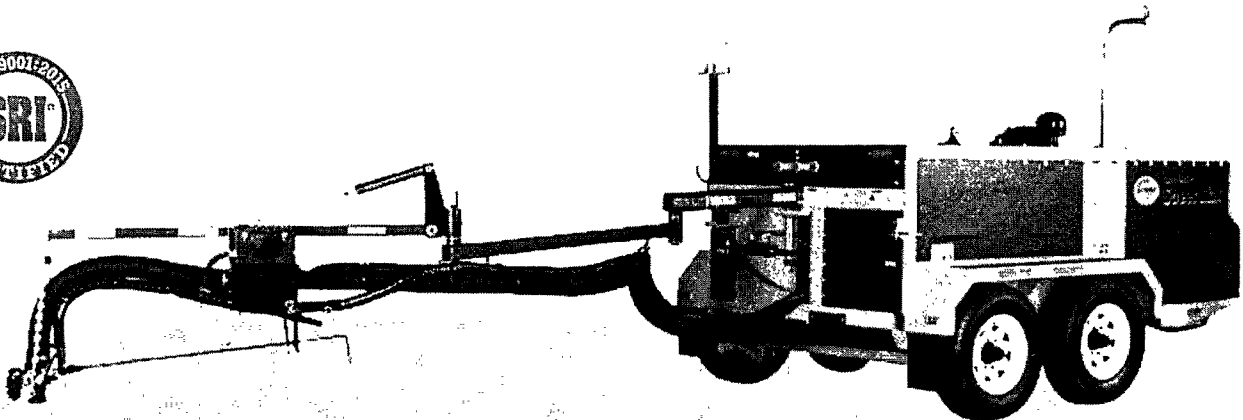
Custom Made-to-Order Hydraulic Hoses: Reduces the opportunity for contamination in Hydraulic System



Cleans - Dust and debris is blown from the pothole by a high velocity blower. The Operator is located in the cab eliminating being exposed to traffic and reducing the risk of potential personal injury.



Tacks - Asphalt emulsion is sprayed to seal the surface and create a binder for the repair. A nozzle tilt allows for more efficient movement of rock when cleaning the repair and reduces rock bounce.



Unibody Construction: Durable construction designed for long life and low cost of ownership

300 Gallon Emulsion Tank: Allows for fewer refills during the day for better productivity

