City of Kirkwood

Pavement Condition Assessment - Final Report

July 2015

LOCHMUELLER GROUP

PAYKEN CONSULTING LLC

PAVEMENT CONDITION ASSESSMENT

CITY OF KIRKWOOD, MISSOURI

FINAL REPORT

PREPARED BY

IN COOPERATION WITH

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Introduction

The City of Kirkwood faces the challenge of determining how it will provide for the long-term rehabilitation and maintenance of its streets. This report was produced at the direction of the Kirkwood City Council in response to concerns about the condition of the City's streets and the projected budget expenditures needed for their repair.

Executive Summary

The estimate of pavement related expenditures projected over the next five years under current fiscal conditions is $41.4 million as determined by MicroPAVER's work plan module. This calculation was based on the default maintenance policies contained within the software and can be refined as the City of Kirkwood develops and refines their own maintenance policies.

The team of Lochmueller Group and Payken Consulting inventoried and surveyed approximately one-hundred and fourteen (114) centerline miles of streets in the City of Kirkwood. The overall average surface condition index of the street network in the City of Kirkwood is 64, or the lower end of the good condition range, based on a scale from 1 to 100 with 100 being a new street. The deterioration of the City's streets will occur with increasing frequency as the overall condition of Kirkwood's streets fall below the critical Pavement Condition Index (PCI) of 55.

The structural distress in streets within the City is a function of a number of factors: 1) fatigue from repetitive stresses of wheel path traffic, as referenced in Figure 1; 2) temperature changes coupled with advanced oxidation of the asphalt cement (the tendency for asphalt to oxidize with age, making the pavement brittle, amplifies the stresses of both traffic and temperature); and 3) settlement of the road bed, due to water reaching the subgrade soil. Each of these processes leads to extensive cracking within the surface of the pavement.

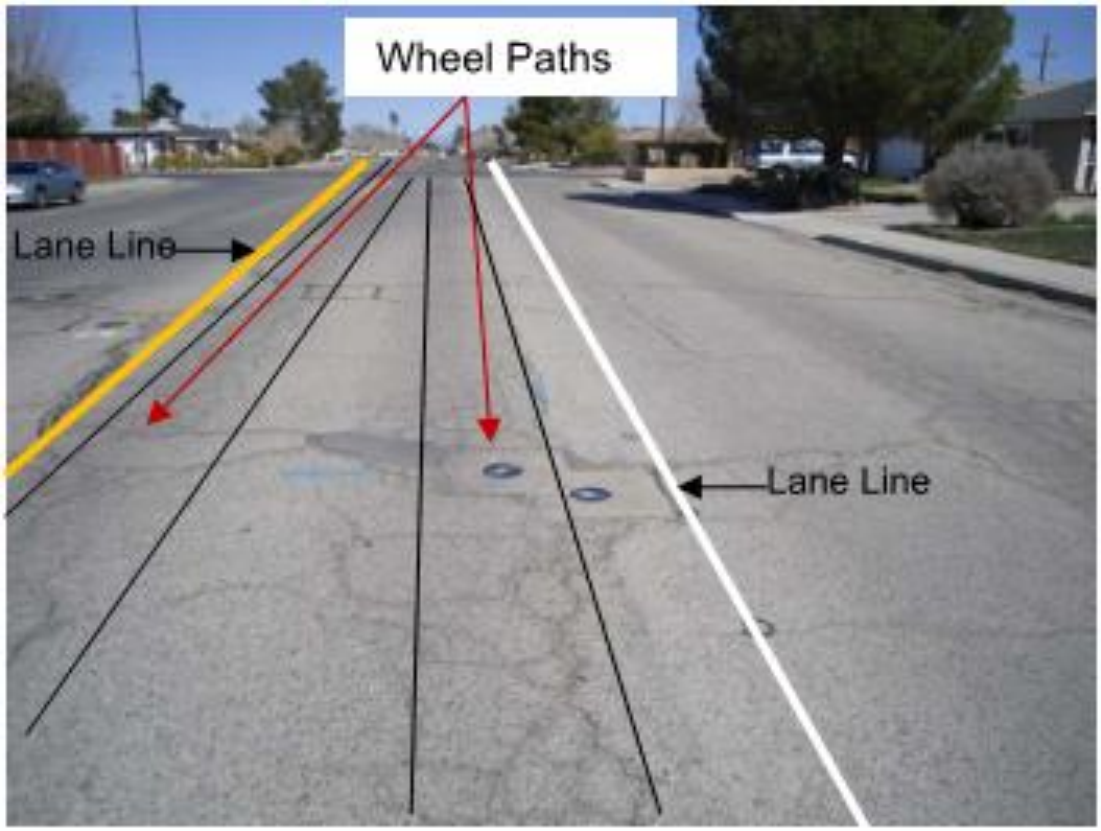


Figure 1: Example of Wheel Path Traffic Wear on Pavement

Once the pavement is cracked, water can move into the underlying soil causing loss of support to the pavement in surrounding areas. An acceleration of the spread of cracking usually results. Further deterioration of a different type follows, beginning at the originally cracked area. Water and traffic will cause a base failure, such that reconstruction is necessary. This secondary deterioration is also accelerative, in that the more base failure, the faster is the spread of base failure in surrounding areas.

The budget estimates cited in this study are only for pavement reconstruction. They do **not** include the following items:

- Grading
- Subgrade preparation needed due to unsuitable soil or wet conditions
- Utility relocations
- Storm or sanitary sewer reconstructions
- Roadway realignment
- Special provisions for residents
- Traffic control
- Sidewalks
- Street signage
- Street lighting

Further study by City Staff or hired consultants regarding specific projects is necessary to determine project scope, maintenance selected and reconstruction costs.

A goal the City could consider is increasing the slope of the overall PCI curve over time. By implementing this goal with possible funding mechanisms discussed later in the report, the City would improve the overall quality of their streets and minimizing deferred maintenance.

This study was limited to the assessment and analysis of the City's public roadways and does not contain condition assessments for the following:

- City-owned building and facilities
- Heavy equipment
- City bridges
- Private Roads within Kirkwood (see Appendix H for a complete listing)

2

Pavement Management

Pavement management is the practice of planning for pavement repairs and maintenance with the goal of maximizing the value and life of a pavement network.

To accomplish this, a community needs to have several repair techniques in its arsenal and the knowledge of when to apply them. This is where pavement management comes into play. With a comprehensive database of road conditions, pavement management software can model when to perform which repairs on a road network. Of course, engineering judgment is required to finalize any list of street repairs, as no computer model can take every variable analyzed in making a repair decision into account. Pavement management software is a great springboard to help a community start its repair program for each year and serves as an excellent method of storing the repair data. Lochmueller Group, working in conjunction with Payken Consulting, utilized a computerized Pavement Management System (PMS) developed by the U.S. Corps of Engineers Laboratory entitled MicroPAVER. A full description of this program and its capabilities is provided in Appendix B of this report.

The MicroPAVER System

The MicroPAVER System utilizes a numerical score to indicate the condition of each street. This score is called the Pavement Condition Index (PCI) and is based on the amount and type of surface defects, for example, longitudinal and transverse cracks, potholes, alligator cracking and others as illustrated in Figure 2. The PCI score can range from 0 to 100 with 100 representing new pavement. The computer program makes extensive use of pavement condition life cycle relationships. The pavement condition history is developed over a number of years and inspections. Eventually this information will be completely customized for Kirkwood's needs. The computer software does contain default life cycles for various pavement types (full-depth asphalt, concrete with asphalt overlay and concrete streets).

The scores are based on observation of cracks, potholes, ruts, patches and other surface distress. The severity and extent of pavement distress are both considered. The PCI rating can vary throughout a street. However, it is generally tied to a previous

maintenance action for a section of street, e.g., the PCI for a portion of a street with a recent overlay will be higher than the part which has not had recent maintenance. Conducting a full inventory of the street system which includes a full evaluation of pavement condition assists the expert reviewer in identifying necessary improvement strategies.

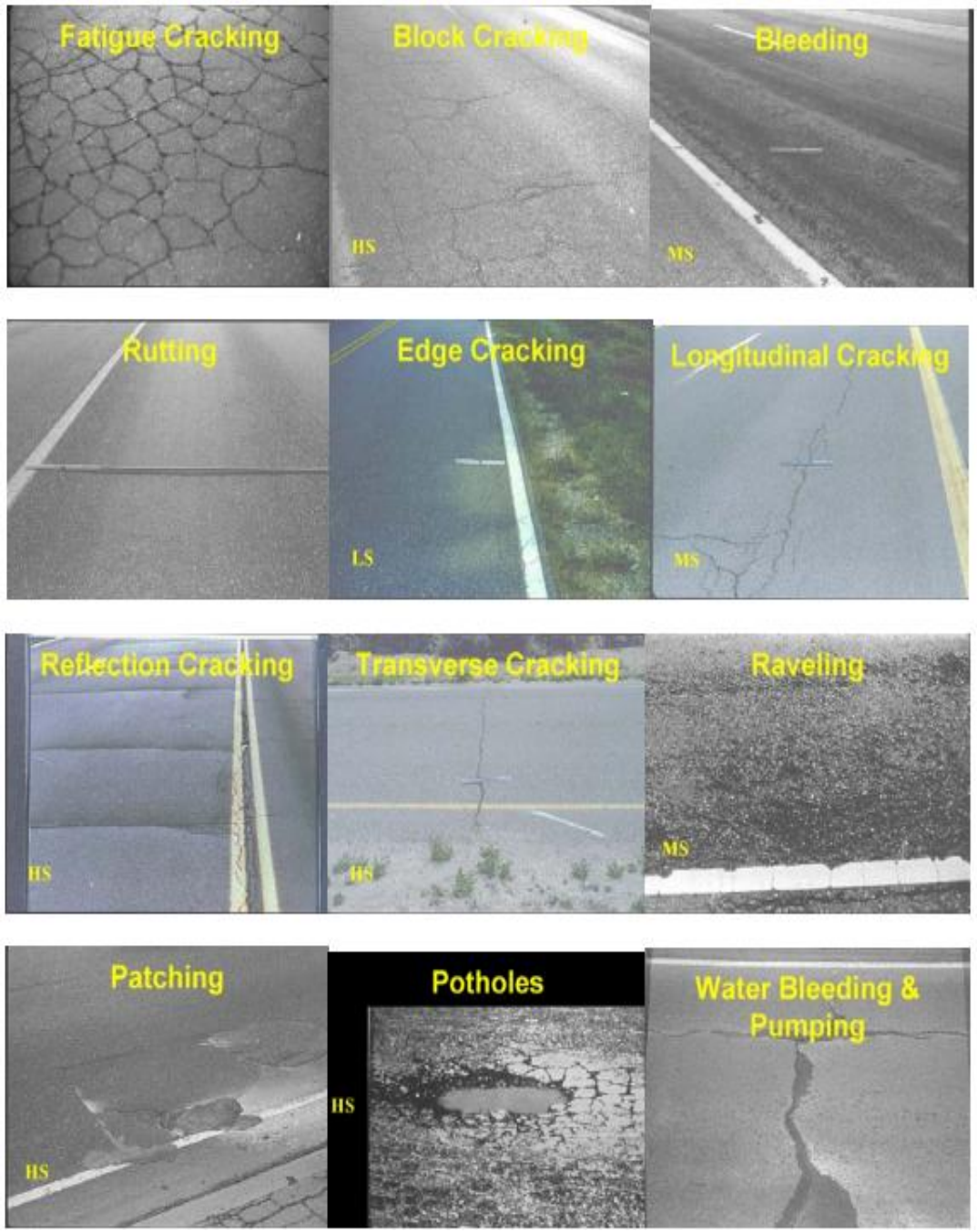


Figure 2: Examples of Pavement Surface Distress

Figure 3 illustrates the typical pavement condition life cycle. The focus of the data inventory process centered around the collection of the pavement area, pavement material composition and last known date of the roads to be tested. After obtaining this information, a system of separating the road into networks or "families" is performed followed by branches, sections and furthermore into sample units. Once inspection data is populated within the program then a family curve is used to project the future condition of the pavement. This capability provides the user a powerful tool for determining the capital expenditure needs with regard to street repair.

Upon inspecting the City's streets and loading incremental information into the MicroPAVER program, the results show that the City's average PCI is **64**. The Critical PCI is defined as the PCI value below which the pavement shows a significant increase in the rate of deterioration and preventive maintenance cost. The Critical PCI is usually between 55 and 70. A value of 55 is most likely to be selected unless otherwise indicated. By examining Figure 3 the significance of this score is visually apparent. The significance of this fact cannot be overstated. The implication is clear that the City's streets as a whole are at a point in their life cycle that will result in ever increasing deterioration and maintenance costs if measures are not enacted to reverse this trend.

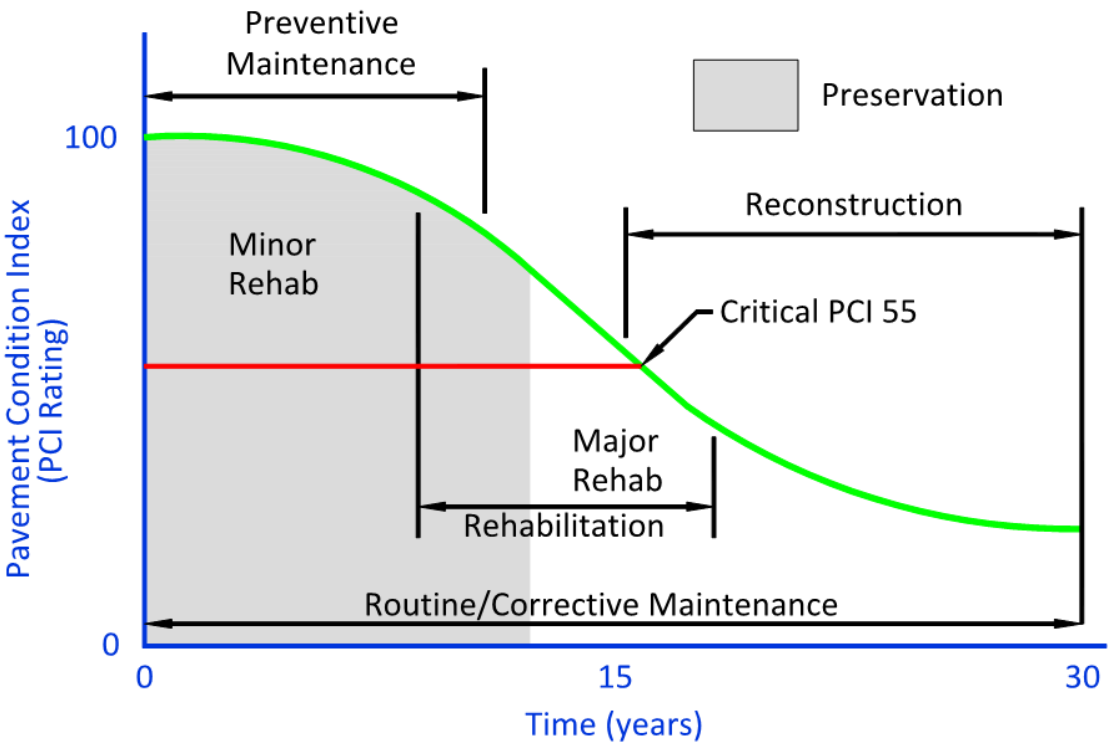


Figure 3: Pavement Condition Index Curve

In addition, the cost to restore this pavement will increase dramatically at the lower end of this life-cycle curve. Obviously, it is more cost effective to maintain Kirkwood's road network in the upper portion of this curve. It should be noted that an adequate amount

of money must be funded in order to maintain the roads at this level. If adequate revenue is not provided for this maintenance, then deferred maintenance occurs.

Pavement Analysis

As the data was reviewed, it became apparent that the City would have to spend approximately $2,000,000 for each 1 point increase in the City's overall street condition. However, when one considers that the streets deteriorate, on average, at a rate of 2-3 points per year (when no maintenance is applied), a total cost of approximately $1,200,000 annually is necessary for the City's streets to maintain their current condition (PCI). This figure may seem staggering, but when you consider the City of Kirkwood has over 600 streets, it takes a significant amount of improvements to increase the overall condition of the City's roadways. An average of three or four street reconstructions each year will not have an appreciable effect on the City's overall pavement condition.

As a way to illustrate this cost relationship, it may be helpful to consider that if the City did four street reconstructions each year, it would take over 150 years to rebuild all the City's streets. When you factor in a 30-year design life, the numbers really start to work against any meaningful overall improvement in the City's streets.

It should be noted that for a number of years the City and its residents enjoyed streets that were in consistently high condition. Examining Figure 3 again, one can see that it was not necessary for the City to perform extensive major maintenance and repair to maintain a fairly high level of service for the first 25% of the street's service life.

What has traditionally been Kirkwood's advantage is now turning into Kirkwood's liability. Many of Kirkwood's streets are approaching the end of their service lives simultaneously. There exist a number of repair alternatives that the City may wish to consider for addressing this situation. The amount of manpower and materials Kirkwood currently has available to address all of their various maintenance needs are inadequate at this time. Our analysis indicates that the City will realize a better return on its maintenance investment by applying the appropriate maintenance operation to Kirkwood's streets when they are within the preventative maintenance position of the pavement condition curve (PCI range 60-80). Therefore, it is recommended that the Department of Public Services adopt a policy of maintaining the condition of streets at the upper end of the pavement condition curve (PCI range 60-80) and consequently allowing the worse-conditioned streets to continue to deteriorate until they are replaced. The City will spend less money and realize a higher return on its maintenance investment using this type of prioritization scheme.

There are a number of factors that have contributed to the condition of Kirkwood's streets. They are, in no particular order, as follows:

- The discontinuation of the City's chip seal program
- The effect of in-fill housing
- Need for pavement standards
- Mill & overlay program history

Discontinuation of the Chip Seal Program

The City's Street Maintenance Division had for a number of years conducted an annual chip seal program. This program provided for the application of a chip seal surface treatment on every asphalt street in the City on a 5 year cycle basis. At one time it is estimated that 65% of Kirkwood's streets were maintained in this fashion. This low-cost surface treatment (because it was performed in-house with City employees) essentially maintained the City's streets in a good condition for many years. However, the decision was made in 2002 to discontinue the chip seal program and sell off the equipment used to apply the chip seal treatments. This decision resulted in the resumption of the majority of the City's streets continued deterioration. The average condition of Kirkwood's asphalt streets is now **60.3**, roughly 5 points difference from the critical PCI (The Critical PCI is 55). There presently exist a number of alternative surface treatment options (such as; micro surfacing, NOVACHIP, slurry seal and other similar products. Frequently, loose stone is cited as the principle objection with chip seal. If that objection was the basis for deciding to discontinue the chip seal program that would be understandable. However, there were other options that should have been implemented in place of the chip seal program. None of these alternate surface treatments cited above share chip seal's loose stone "problem." Unfortunately, this group of asphalt streets which have been previously chip sealed is now in a state of disrepair that makes surface treatments a poor choice for extending their service life.

Effect of In-Fill Housing

Over the last twenty years Kirkwood has experienced a significant number of single family in-fill housing demolitions and reconstructed houses. This typically involves a home builder purchasing an existing, smaller, older house; razing it and rebuilding a house that is typically significantly larger (and more expensive) than what was demolished. The effect of in-fill housing is experienced in a number of ways that are detrimental to Kirkwood's streets. First, each of these new homes must have their existing utilities disconnected prior to demolition. Typically, the water, gas, electric and sewer lines all must be taken out of service, capped or removed. These same services will then be reestablished later, constructed in compliance with current building codes. The survey team noted in the field that the typical utility cut for an in-fill house is 10 ft. x 10 ft. square. The first utility cut on a given street lowers the PCI by 15 points. The second utility cut lowers the street's PCI by another 10 points, for a total of 25 points. The third utility cut lowers the street's PCI by another 5 points, for a total of 30 points for each subsequent utility cut a diminishing number of points are deducted from the street's overall PCI rating. For example, on North Harrison Avenue between West Rose Hill Avenue and West Essex Avenue there have been at least twenty-four (24) in-fill houses constructed resulting in a PCI of 35. The larger the amount of utility cuts on a street the higher the impact they will have on degrading the pavement score within the MicroPAVER software program. In a somewhat counter intuitive manner it should be noted that the impact of utility cuts is greater for streets that have a higher PCI (between 75 and 100) than on a street that is already in bad shape prior to adjacent in-fill housing. An excellent example of this dynamic is seen on Glendover Drive (off of Dickson Street). Glendover Drive is an asphalt roadway with a chip seal maintenance application in which there are two sample units on the street. On one end of the street

the sample unit's PCI was 90, where the housing stock is original construction. However, at the other end of the street, where a couple of teardown homes have been rebuilt, the sample unit's PCI is 63. The second effect of in-fill housing is that of truck traffic. On each in-fill house upwards of 50 truck deliveries occur bringing all manner of construction materials to the site. Multiplying the 50 deliveries by the aforementioned twenty-four (24) in-fill houses on North Harrison Avenue will result in over 1,200 truck deliveries that this community and its streets would not have otherwise experienced. Many of Kirkwood's neighborhoods that have the greatest amount of interest for the in-fill housing market are located in the older parts of the City that contain a number of different pavement types and compositions that were built 75-100 years ago when large trucks did not exist.

Pavement Standards

Kirkwood's streets vary widely in width and pavement composition. Street width can be as narrow as 15 ft. with varying widths between 15 ft. and 45 ft. with no definitive standard. We recommend the City adopt a minimum standard of 26 ft. wide pavement with no parking posted on one side. We also observed instances where six inch vertical concrete curb and gutter were reconstructed when a better choice due to the sidewalk height and the surrounding terrain would have been a standard 3 inch concrete rolled curb and gutter system. Another issue confronting Kirkwood's streets is the almost complete lack of appropriate preventative and safety maintenance performed by the City's Street Maintenance Division. A disturbingly high number of streets have received no asphalt mat repair or crack sealing for what looks to be upwards of 20-30 years. Our team recommends the Department of Public Services engage in a thorough analysis of the Street Maintenance Division's priorities and makes appropriate organizational changes to bring about the desired service level. Appendix F shows recommended pavement restoration standards that the City should consider adopting. Still another factor effecting Kirkwood's streets is the prevalence of curb cuts and other ad hoc efforts to route downspouts and sump pumps.

We recognize that residents are attempting to install solutions they think is in their best interests. However, it appears that in too many instances what is best for the residents is not in the best interests of the City's streets. Frequently, builders and home owners merely cut a slot in the curb and gutter and discharge their storm water effluent directly into the street causing a greater degree of pavement deterioration than would not otherwise exist. Meaningful standards should be adopted and enforced to minimize this type of damage to the City's infrastructure. Finally, the other significant challenge Kirkwood faces is the prevalence of alligator cracking within the pavement network. Alligator cracking is defined as a base failure by the MicroPAVER program. As such, the pavement structure is insufficiently strong enough to carry the loads that it currently experiences. This fact places a special burden on the Department of Public Services due to the fact that in many areas there is not sufficient curb height to add extra material thus strengthening the pavement. Reconstruction is therefore the only option available for a failed pavement, thus increasing the budgetary demands of the Department.

Mill & Overlay Program History

Historical project information for previous year's mill and overlay were made available to the study team. The following tables breakdown each year's projects and based on each street's 2015 PCI rating as well as the given year's (2009, 2010, 2011, etc.) average PCI rating versus the PCI rating calculated by MicroPAVER (MicroPAVER calculates a default deterioration rate of 3 points per year).

2009	
STREET	**PCI RATING**
Lindeman (Des Peres city limits to Dougherty Ferry)	59
N. Clay (W. Essex to W. Adams)	45
N. Clay (Wilson to Barter)	60
S. Clay (W. Madison to W. Woodbine)	52
N. Taylor (E. Essex to E. Washington)	58
N. Taylor (E. Washington to E. Adams)	83
E. Argonne (S. Taylor to Holmes)	59 & 77
E. Washington (Kirkwood to N. Taylor)	72
W. Washington (Kirkwood to N. Clay)	64
Wilson (N. Clay to Kirkwood)	71
S. Harrison (W. Adams to RR Bridge)	40 & 63
2009 Average PCI =	**61.7**
MicroPAVER Predicted PCI =	**82**

Table 1: PCI Ratings for each Project in 2009

2010	
STREET	**PCI RATING**
Lemp	52 & 56
E. Rosehill	46
W. Monroe (N. Geyer to N. Harrison)	47
W. Monroe (N. Harrison to N. Clay)	72
S. Van Buren (W. Monroe to W. Woodbine)	79
S. Harrison (W. Monroe to W. Woodbine)	63
McCullough (S. Van Buren to S. Clay)	62
Heege	52
Hillcrest	53
Idlewild	47
W. Clinton (S. Clay to Kirkwood)	48
Silver	59
W. Jefferson (N. Clay to N. Harrison)	70
S. Geyer (Big Bend to City Limits)	72
Leffingwell (Scott to City Limits near Holmes)	42
N. Woodlawn (Manchester to City Limits)	60
S. Woodlawn (E. Adams to E. Argonne)	46
E. Bodley (Homewood to N. Woodlawn	61
S. Woodlawn (E. Argonne to Scott)	47
Nirk (Geyer to Couch)	67
S. Fillmore (E. Woodbine to E.Rosehill)	61
Forest (Big Bend to Marco)	73
E. Monroe (S. Woodlawn to Scott)	78
Nelda	68
Swan (Kirkwood to N. Taylor)	65
Duley	75
Frieda	72
Altus	83
Lockett	57
2010 Average PCI =	**61.1**
MicroPAVER Predicted PCI =	**85**

Table 2: PCI Ratings for each Project in 2010

2011	
STREET	**PCI RATING**
W. Woodbine (S. Geyer to S. Clay)	65
W. Woodbine (S. Clay to Kirkwood)	65
Goethe (W. Essex to Wilcox)	68
Wilcox (Goethe to Dead End)	62
Clemens (Knierim to W. Essex)	63
Central Ave (N. Geyer to Goethe)	58
Central Place (N. Van Buren to N. Geyer)	34
Dickens (Central to Knierim)	67
Longfellow (Central to Knierim)	77
Longfellow (Knierim to W. Washington)	82
Burns	72
Elm Tree	71
Edna	73
Bach	80
Janet	81
Thursby	76
Arminda (Virginia to Edna)	86
Arminda (Woodbine to Thursby)	91
Lavinia	85
Lockett Ln	55
Wilton (Forest to near Marco)	55
Virginia	82
2011 Average PCI =	**70.4**
MicroPAVER Predicted PCI =	**88**

Table 3: PCI Ratings for each Project in 2011

2012	
STREET	**PCI RATING**
Woodleaf Ct	63
Julian Pl	89
E. Essex Ave	80
Cranbrook Dr	88
Hawbrook Ln. (Triangle off Dickson)	96
Hawbrook Ct. (N. off Hawbrook Ave)	97
Parkwoods Ave (Adams to Hawbrook)	78
Parkwoods Ave (North off Hawbrook)	93
Parkwoods Ave (South off E. Essex)	62
Luther Ct	92
Norfolk	72
Longview Blvd	88
Claybrook	100
Ericson Place	93
Fairwood Ln	54
Churchill Ln	82
Seekamp Ave	99
Wood Ave	91
E. Essex (Kirkwood to N. Taylor)	87
Kneirim	74
Schubert	98
N. Harrison (Peeke to W. Essex)	85
2012 Average PCI =	84.6
MicroPAVER Predicted PCI =	91

Table 4: PCI Ratings for each Project in 2012

2013	
STREET	PCI RATING
Couch Ave (Big Bend to cul de sac)	95
Couch Ave (Big Bend to Rosehill)	85
Couch Ave (W. Rosehill to W. Adams)	78
Couch Ln (cul-de-sac below Big Bend)	64
Marjean Ct	100
Andrews Ave	83
Mclain Ln	96
Boxwood Ln	99
Forest Glen Ln	92
W. Rose Hill Ln (Couch to Craig)	98
Grandview	97
Robert Ave	100
Harvey St	100
W. Rose Hill Ln (S. Geyer to Couch)	86
2013 Average PCI =	90.9
MicroPAVER Predicted PCI =	94

Table 5: PCI Ratings for each Project in 2013

When major maintenance activities, such as mill & overlay or complete reconstruction, are entered into the Work History module of the MicroPAVER software the PCI is reset to 100. Even though the software considers a complete reconstruction (such is currently happening on North Clay Avenue) equivalent to a mill and overlay; in point of fact these two types of projects are not equivalent in long term performance. A complete street reconstruction has a longer service life and remains in better condition longer than a mill and overlay process. In other words, the deterioration rate for a milled and overlaid street is greater than that for a reconstructed street. That being said, the previously cited average PCI scores for each year's mill and overlay suggests that some of these streets were poor candidates for mill and overlay based on the low PCI scores. Those streets with low PCI ratings are attributed primarily to extensive alligator cracking which is an indication of base failure.

Over recent years City Staff has specified no joint fill material for all reconstructed concrete streets. Whether or not this practice is a good policy for the City, to continue this practice is beyond the scope of this study. It should be noted that the MicroPAVER software deducts 4 points from the PCI rating for non-crack sealed joints.

3

Budget Analysis

A generally accepted level of service for a community with the age of Kirkwood would be in the range of 75-80 PCI. A city can defer a great deal of expenditures in its initial growth years. However, as streets age they require more and more maintenance to keep them in an acceptable condition. The continued deterioration of Kirkwood's streets is inevitable, if unchecked.

Current PCI Condition

As stated previously, Kirkwood's current network PCI is 64 which is considered the low end of the good range. The PCI scale is defined below in Table 6:

PCI Scale	
Excellent	86 - 100
Very Good	71 - 85
Good	56 - 70
Fair	41 - 55
Poor	26 - 40
Very Poor	11 - 25
Failed	0 - 10

Table 6: Pavement Condition Index (PCI) Scale

Projected PCI Conditions

The following chart assumes that no additional revenues for street maintenance are available, which over the next 20 years is admittedly unlikely. However, it does provide tangible evidence of the inexorable deterioration of Kirkwood's streets. Table 7 illustrates the cumulative effect caused by deferred maintenance over the next 20 years.

PROJECTED NETWORK PCI (Safety Repairs Only)		
YEAR	PCI RATING	
2015	64	
2016	61	
2017	58	
2018	55	* critical PCI
2019	52	
2020	49	
2021	46	
2022	43	
2023	40	
2024	37	
2025	34	

Table 7: PCI Ratings as a Result of Deferred Maintenance

Budget Scenarios

OPTION #1

Unlimited funding (heavy first and second year needs)

Cost: $97,500,000.00

Result: PCI is raised from 64 to 82 in first year, 100 in the second year and levels out at 92 by the fifth year. There is no deferred maintenance after the second year.

OPTION #2

Safety repairs only

Cost: $250,000.00 annually

Result: Gradual decline from current PCI of 64 to a PCI of 52 by the fifth year.

OPTION #3

Cost: $1,000,000 annually

Result: PCI decreases from 64 to 60 in year 5. There will be deferred maintenance contingent upon future funding levels as shown in the below Figure 4.

Budget Consequence

$1,000,000 Budget

Year	Condition PCI	Funded	Unfunded
2015	64	$1,000,000.00	$31,200,000.00
2016	63	$1,000,000.00	$32,500,000.00
2017	62	$1,000,000.00	$33,800,000.00
2018	61	$1,000,000.00	$35,100,000.00
2019	60	$1,000,000.00	$36,400,000.00
	Total:	$5,000,000.00	

Total Cost: $41,400,000.00

Figure 4: PCI Ratings as a Result of $1,000,000.00 Annual Budgeted Maintenance

OPTION #4

Cost: $1,500,000 annually

Result: PCI increases from 64 to 67.1 by year 5. Option #4 will result in the satisfactory maintenance of all pavements above the critical PCI. However, limited funds will be available for pavements requiring major maintenance or repair. There will be greater levels of deferred maintenance as shown in Figure 5 on the next page.

Budget Consequence

$1,500,000 Budget

Year	Condition PCI	Funded	Unfunded
2015	64	$1,500,000.00	$28,600,000.00
2016	64.8	$1,500,000.00	$29,500,000.00
2017	65.9	$1,500,000.00	$30,200,000.00
2018	66.5	$1,500,000.00	$31,350,000.00
2019	67.1	$1,500,000.00	$32,200,000.00
	Total:	$7,500,000.00	

Total Cost: $39,700,000.00

Figure 5: PCI Ratings as a Result of $1,500,000.00 Annual Budgeted Maintenance

OPTION #5

Kirkwood Budget identified by Director of Public Services

Cost: $2,000,000 annually

Result: PCI increases from 64 to 70 by year 5. There will be a degree of deferred maintenance but less so than other budget scenarios. There will be even greater levels of deferred maintenance as shown in Figure 6 on the next page.

Budget Consequence

$2,000,000 Budget

Year	Condition PCI	Funded	Unfunded
2015	64	$2,000,000.00	$26,000,000.00
2016	65	$2,000,000.00	$26,500,000.00
2017	66	$2,000,000.00	$27,000,000.00
2018	68	$2,000,000.00	$27,600,000.00
2019	70	$2,000,000.00	$28,000,000.00
	Total:	$10,000,000.00	

Total Cost: $38,080,000.00

Figure 6: PCI Ratings as a Result of $2,000,000.00 Annual Budgeted Maintenance

All five above mentioned options are compiled in the below Figures 7 and 8 graphically illustrating the various budget scenarios with the required annual spending needed to meet these scenarios.

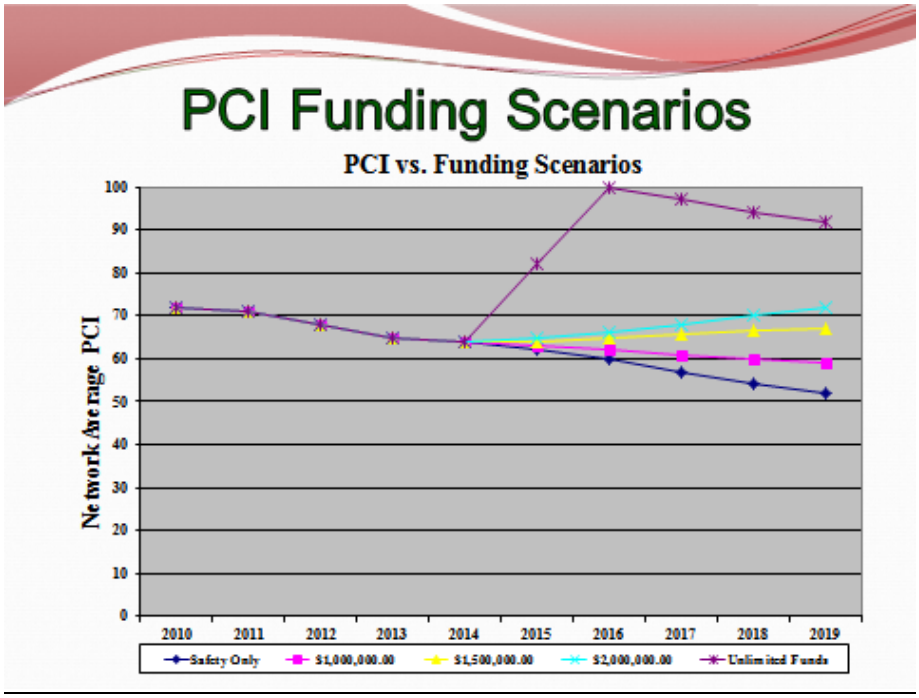


Figure 7: PCI Funding Scenarios

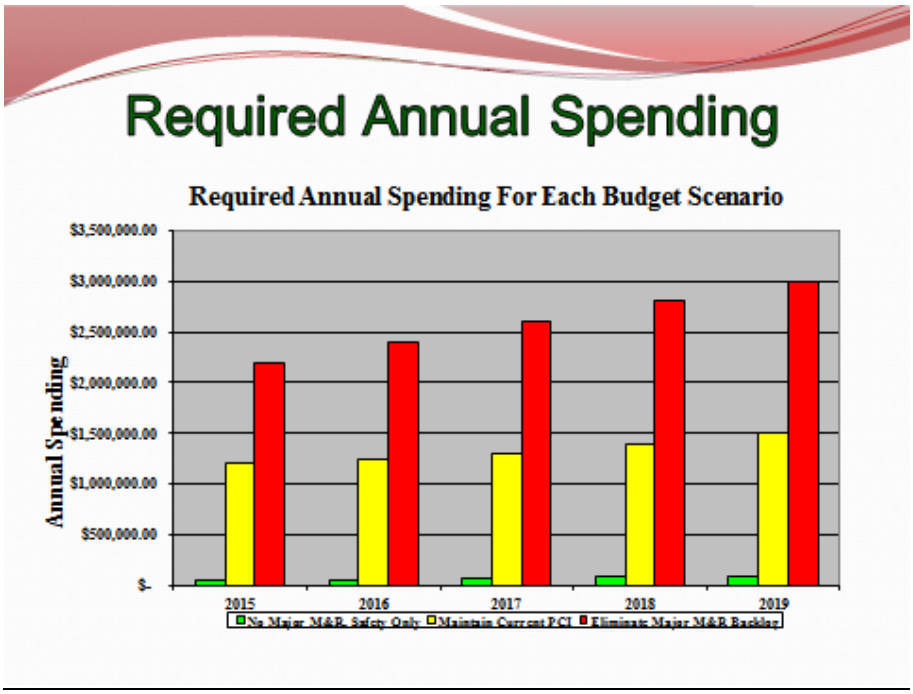


Figure 8: Required Annual Spending for Each Budget Scenario

4

Conclusion

The City should begin to consider identifying potential revenue sources to address the long-term major maintenance and repair needs of their streets. Current funding levels, manpower and materials are insufficient to adequately address the City's maintenance needs well above the critical PCI of 55.

Deferred maintenance has increased significantly over the last 10 years while street reconstruction funding has declined each year. The amount of deferred maintenance will continue to increase as well as the total cost necessary to restore an adequate PCI level to the City's streets should the City decide to defer street maintenance.

The three (3) year Capital Improvement Plan (CIP) has not been developed at this time for the following reasons:

- Future budgets are unknown.
- The maintenance policies unique to Kirkwood have not been developed yet in order to be entered into the PMS software for use in developing a future Work Plan.
- It has not been determined yet what the future role and responsibilities of the Street Maintenance Division shall be and what impact that may have on resource allocation.
- An extensive pavement coring program needs to be developed, implemented and completed prior to the development of maintenance policies which will help guide the Department's future decision making process.

Recommendations

The following funding options exist to enhance street maintenance and capital improvement budgetary support:

Transportation Development District (TDD)

General Obligation Bonds

Neighborhood Improvement Districts (NID)

Community Improvement District (CID)

Transportation Sales Tax

Enhance participation in East West Gateway STP and CMAQ funding

Property Tax Increase

Appendix G contains further information prepared by Mr. James Mello with Armstrong, Teasdale Law Firm describing the use of TDDs, NIDs and CIDs.

APPENDIX A

Definitions

Service level:	the overall condition of a community's streets and the associated expectation regarding the condition of those streets.
PCI	(Pavement Condition Index) – A numerical score representing a particular street's condition
PMS	Pavement Management System
AAC	Full Depth Asphalt Street Construction
APC	Concrete with Asphalt Overlay Street Construction
PCC	Concrete Street Construction
Network	A community (i.e. Kirkwood)
Branch	A roadway (i.e. North Harrison Avenue)
Section	A piece of a roadway broken up for the purpose of maintaining like characteristics (i.e. road width, pavement construction, traffic volume, traffic characteristics, etc.) Based on this definition, North Taylor Avenue has been broken up into eight sections to facilitate MicroPAVER analysis.

APPENDIX B

Explanation of the MICROPAVER System

INTRODUCTION

In order to effectively manage a City's streets, a systematic, objective method of determining maintenance and rehabilitation (M&R) needs and priorities must be used to ensure efficient allocation of resources. Both engineering and economic factors must be taken into consideration in determining cost-effective M&R strategies. In 1968, the U.S. Army Construction Engineering Research Laboratory (USACERL) began developing the Pavement Maintenance Management System, now known as PAVER, to assist as a tool in making standard, practical decisions.

PAVER was developed under the auspices of Headquarters, U.S. Army Corps of Engineers through funding from the Army and Air Force. It was originally designed to be operated on a mainframe computer at military installations, but also has far reaching application among municipalities, airports and counties. PAVER was field tested and validated at Fort Eustis, VA through full scale demonstration monitored by 21 pavement engineers.

One of the primary functions of a PMS is predicting pavement condition into the future. To make this projection, there must be an objective repeatable scale for determining the present pavement condition. PAVER uses the Pavement Condition Index (PCI); a numerical index from 0 to 100 that gives an indication of a pavement's structural integrity and operational condition. The PCI is based on the types, severity, and quantity of pavement distress identified during a condition survey.

In 1984, USACERL began developing a microcomputer version of PAVER called MICROPAVER. This project was initially sponsored by the FAA, with additional capabilities funded by the Army and Air Force. MICROPAVER maintains most of the capabilities of mainframe PAVER, while taking advantage of the more user friendly features of a microcomputer. MICROPAVER offers an economical solution to small database users seeking the advantages provided by a PMS. The American Public Works Association (APWA) has adopted MICROPAVER as the best available Pavement Management System (PMS) and has assisted in implementation at more than 90 military installations and 400 civilian facilities.

PAVEMENT MAINTENANCE MANAGEMENT CONCEPTS AND COMPONENTS

Overview

In past years, when maintenance funds were easier to obtain, pavement maintenance was typically performed as the need was brought to the engineer's attention. Past experience tended to dictate the selection of short-term repair techniques with little regard given to the long-term effects of the selected remedy. In today's economic environment, as pavement deterioration rates exceed the availability of M&R funds, a more systematic approach to determining M&R needs and priorities is required. Pavement networks must now be managed, not simply maintained.

The recent emergence of Pavement Management System (PMS) products has provided engineers with the tools needed to manage their pavements economically. A PMS provides a systematic, consistent method for selecting M&R needs and priorities and determining the optimal time of repair by predicting future pavement condition. The importance of early detection and repair of pavement distress cannot be overstated; the consequences of neglect and deferred maintenance are plotted in Figure 3. If repairs are performed during the early stages of deterioration before the sharp decline in pavement condition, repair costs of 80 percent can be realized. In addition to money savings, less shutdown time would be required, making neglect a costly alternative. A PMS can be used to alert the manager to this point in a pavement's life cycle.

Pavement management consists of two levels of analysis (1) the network level, in which the agency's entire pavement network is considered for budgeting, planning, scheduling, and selection of potential M&R projects and (2) the project level, in which potential projects are evaluated in more detail to identify feasible alternatives that address the site-specific conditions. The final step in project-level analysis is to perform life-cycle costing for selection of the most cost-effective M&R alternative. The scope of this report will be confined to network level analysis. Should the City give conceptual approval of the recommendations contained in this report, it will be necessary for City Staff to complete project-level analysis in order to "nail down" each street's M&R costs.

Approaches to Determining M&R Needs

Various organizations in the United States use different approaches to determine the necessary maintenance and rehabilitation for a given pavement section. Brief descriptions of the three most common approaches follow:

Ad Hoc Approach

Many agencies use the "habitual" or ad hoc approach, in which the staff applies the M&R alternatives that experience indicates is the best solution. Evaluation suggests that this approach results in the seemingly habitual application of a selected few

alternatives. A major drawback to this approach is that because of the limited set of alternatives, the best or more economical option for the pavement being considered may not be selected.

Present Condition Approach

In the "present condition" approach, the pavement is first evaluated using various condition indicators. Based on an analysis of these indicators, an M&R alternative is selected to correct the condition; however, no life-cycle cost comparisons of the alternatives are considered. A major advantage of this approach is that the prescribed M&R alternative addresses the deficiencies found in the pavement. The disadvantage is that the choice may not be the most cost-effective method.

Life Cycle Approach

The "Life Cycle" approach requires not only an in-depth evaluation of the pavement under consideration, but also prediction of its future condition. This process ensures selection of the most economical M&R strategy, as determined on a life-cycle cost basis. Projection of future condition requires the ability to measure condition on an objective, repeatable scale. By projecting rate of change on an objective condition scale, a meaningful life-cycle cost analysis can be performed to compare the various M&R alternatives and the future maintenance costs associated with each. Not only is the best M&R alternative selected, but the optimal time of application is also determined. As discussed earlier, such a decision is critical in order to avoid the higher M&R costs caused by excessive deterioration.

Project- vs. Network-Level Management

The individual selection of the best M&R alternative for each project being considered is known as "project-level management." Each project is analyzed in detail and the most feasible alternative is selected on a case-by-case basis. Little or no consideration is given to the resource requirements of the other projects being evaluated. Engineers have traditionally been trained to work at the project level, which may be acceptable as long as money is abundant.

However, this approach is no longer feasible due to the ever increasing budget constraints. Top management is now demanding budget projections for each fiscal year. This process is not possible within current resources if there must be an in-depth evaluation for each project to arrive at required budgets. Instead, the pavement network must be inspected in less detail and at a faster rate to identify a list of potential projects. When the needs of the entire network are considered, the process is referred to as "network-level management." When a pavement section is selected as a potential project, only then is it scheduled for in-depth evaluation and selection of a specific M&R strategy at the project level.

In general, network-level management considers the agency's short- and long-range budget needs, present and future overall network condition, and the identification and prioritization of potential projects to be considered at the project level. At the project level, the primary objective is to select the most cost-effective M&R strategies within existing management constraints.

Network-Level Management in a PMS

In network-level management, current and future M&R requirements are determined by considering the needs of the entire pavement network. The most important step in analyzing network needs accurately is to project the future condition of each section. This projection provides the input needed to perform two tasks: (1) scheduling future condition inspections and (2) identifying sections that will require major M&R in future years for budget estimating.

Pavement sections are flagged for inspection when their projected condition falls below a user-specified minimum allowable condition level. Ordinarily, this will be the point at which the pavement begins the sharp decline in condition and at which M&R should be performed. Also, based on the section's rate of deterioration, or loss of PCI points per year, re-inspections are scheduled, allowing pavements with a high rate of deterioration to be inspected more often than those with a lower rate.

Some examples of MicroPAVER financial capabilities include:

Five-Year Budget Forecasts: Based on local maintenance costs, the deterioration rates of individual local pavements and other factors, MICROPAVER will estimate annual maintenance budget needs.

Budget Scenarios: MICROPAVER can develop "what if" maintenance budget scenarios that relate budget packages to expected street conditions and future budgets.

Forecasts of Pavement Condition: Forecasts of future pavement conditions can be developed reflecting the consequences of deferred maintenance.

Project Prioritization: MICROPAVER will target pavements that should receive immediate attention by using a variety of criteria selected by Kirkwood staff.

Life-Cycle Costing: There are several programs to help select the maintenance strategy with the lowest long-term (life-cycle) cost and longest life expectancy.

Budget Optimization: MICROPAVER will identify those maintenance alternatives and those projects under consideration that will optimize a given budget.

The forecasted budget requirements calculated by the PMS should be compared with the actual amount of money allocated for M&R in the program year. When the

forecasted budget requirements exceed the actual amount of dollars available, as is usually the case, a prioritization scheme should be developed to provide a method of determining which pavement sections will be repaired first. By comparing the prioritized projects with the actual budget, a list of potential projects which are candidates for M&R in the current program year is produced. This potential project list provides the basis for project-level management.

Typically most cities utilize a worst-first priority scheme as shown below.

"WORST-FIRST"

PCI Range	Arterial	Collector	Residential
56-100	7	8	9
41-55	4	5	6
0-41	1	2	3

However, extensive PMS research has shown the reverse priority scheme is most cost effective. That is, over the life of the pavement you realize higher service levels for less money when this type of priority scheme is used.

"COST-EFFECTIVE"

PCI Range	Arterial	Collector	Residential
56-100	1	3	6
41-55	2	5	8
0-41	4	7	9

Project-Level Management in a PMS

In project-level management, each section identified in the network analysis as a candidate for M&R in the current year should be subjected to a detailed condition survey. The results of these detailed surveys are then used to identify feasible alternatives that can correct existing deficiencies and prevent their recurrence. The various alternatives identified, including "no action," should be compared on a life-cycle cost basis. In addition, the economic feasibility of combining adjacent sections into one large project should be investigated. The results, combined with any budget and/or management constraints, produce the final M&R project list for the current program year. A more sophisticated analysis for the current year's projects would include consideration of the benefits associated with each feasible alternative for each section. An analysis of both benefits and life-cycle costs produce M&R alternatives that ensure maximum return on investment for the agency.

Benefits of a PMS

Implementation of a PMS benefits the user in several ways. With an objective, consistent method of evaluating pavement condition, M&R needs and priorities can be determined on a systematic, documented engineering basis. Necessary budget requirements can be identified for maintaining pavements at various levels of serviceability, and the effects on the pavement network of delaying the necessary repairs can be shown. Finally, a PMS can be used to ensure selection of the most cost-effective M&R strategy by performing a life-cycle analysis on all feasible M&R alternatives. It is important to remember that a PMS does not replace good engineering judgment. It serves only as a tool to assist the engineer in the decision-making process.

PAVEMENT CONDITION SURVEY AND RATING PROCEDURE

Overview

The most useful feature of an effective PMS is the ability to both determine the current condition of a pavement network and predict pavement condition some time into the future. To predict condition reliably, an objective, repeatable rating system for identifying the pavement's present condition must be used. The MICROPAVER System uses the PCI, a numerical index ranging from 0 for a failed pavement to 100 for a pavement in perfect condition, as its pavement condition rating.

The PCI is calculated based on the results of a visual condition survey in which distress type, severity, and quantity are identified. Field verification of the PCI inspection method has shown that the index gives a good indication of a pavement's structural integrity and operational condition. It has also been shown that, at the network level, the observation of existing distress in the pavement provides a useful index of both the current condition and an indication of future performance under existing traffic conditions, without requiring comprehensive testing programs such as roughness, skid resistance, and structural capacity. As a result, large savings can be realized in terms of both time and money.

The degree of pavement deterioration is a function of the type of surface distress, distress severity, and amount of distress. Because of the large number of possible combinations, producing one index that would take into account all three factors was one of the major problems in developing the PCI. To overcome this problem, "deduct values" were introduced as a type of weighing factor to indicate the size of the effect that each particular distress type, severity level, and distress density combination has on pavement condition. Based on input from field-testing and evaluating the procedure, accurate descriptions of distress types and severity levels, and the corresponding deduct values, were developed so that the PCI could be calculated.

Pavement Inspection Sampling Techniques

The inspection of every sample unit in a pavement section may require considerable effort, especially if the section is large. In an effort to limit the amount of resources required, a sampling plan was developed so that a reasonable estimate of the PCI could be determined by inspecting only a portion of the sample units in the pavement section. The degree of sampling depends on the current and projected use of the pavement as well as the objective of the survey. For streets and parking lots it is difficult to justify a high degree of sampling unless a project level evaluation is being performed.

DEVELOPMENT OF ANNUAL AND LONG-RANGE WORK PLANS USING MICROPAVER

Introduction

Several engineering studies have shown that the most economical way to preserve pavements is through preventive and timely application of the correct maintenance alternative. Figure 3 is a schematic diagram of a typical pavement condition life cycle showing the significant increase in maintenance cost if the pavement is allowed to deteriorate below a certain condition.

The MICROPAVER system provides personnel with an easy to use decision-making tool for pavement maintenance management. A step-by-step method for annual and long-range planning will help personnel prioritize the pavement system and allocate the budget at the network level. At the project level the MICROPAVER system can help choose the best maintenance and rehabilitation alternative. The goal of this technology is to maximize the pavement condition with the available funds.

ANNUAL WORK PLAN

An Annual Work Plan (AWP) consists of two parts. Annual Recurring Requirements (ARR) and Programmed Year Projects (PYP). Following is a description of each, as well as guidelines for their development using the MICROPAVER system.

Preventive Maintenance

Preventive maintenance consists of activities intended to show the deterioration of street pavement in order to preserve the pavement investment. There are two types of preventive maintenance: localized and global. Localized preventive maintenance includes crack sealing and various patching techniques. Global preventive maintenance includes various methods of surface sealing for asphalt pavements and joint sealing for concrete payments.

The Critical PCI is defined as the PCI value below which the pavement shows a significant increase in the rate of deterioration and preventive maintenance cost. The

Critical PCI is usually between 55 and 70. A value of 55 is most likely to be selected unless otherwise indicated.

As you can see in Figure 3, the City is currently at an overall PCI of 64 which is slightly above the critical PCI of 55. The significance of this fact cannot be overstated. The implication is clear that the City's streets as a whole are at a point in their life cycle that will result in ever increasing deterioration and maintenance costs if something is not done to reverse this trend.

Global preventive maintenance is recommended for those asphalt pavement sections having a PCI above the Critical value and showing minor or no structural distress. The specific type of maintenance depends on the age of the pavement, usage, and existing distresses. For example, a pavement with weathering and raveling will benefit from a fog seal or a rejuvenator. A pavement with a smooth surface or skid problem should not be treated with a rejuvenator but instead should be considered for a chip or slurry seal or programmed for a thin overlay. Global preventive maintenance for PCC pavements usually consists of joint sealing.

Programmed Year Projects (PYP)

PYP includes all pavement sections at or below the Critical PCI as well as sections above the Critical PCI that are beginning to show structural distress. If the budget permitted, performing the most cost-effective M&R on all the PYP sections would be desirable. However, this is usually not the situation. Therefore, it is important to prioritize these sections to ensure the highest return on investment and to meet managerial constraint sand references

APPENDIX C

MICROPAVER Summary Reports

PCI Ratings (by maintenance zones)

PCI Ratings Citywide (Sorted by Maintenance Zone)

Name		To	Width	Length	PID	Section Area (SF)	Pavement Type	Zone	PCI	Number of Sections
Alice Ave.	Scott	dead end	23.	825.	KirkwoodMO::Alice::001	18,975.00	AC	E	**51**	
Angenette Ave.	E. Rosehill north	Thomas	27.	680.	KirkwoodMO::Angenette::002	18,360.00	AC	E	**43**	
Angenette Ave.	E. Woodbine south	island at Thomas	22.	754.	KirkwoodMO::Angenette::001	16,588.00	PCC	E	**54**	
Ashwood Ln.	S. Geyer	Boxelder	27.	675.	KirkwoodMO::AshwoodLn::001	18,225.00	PCC	E	**62**	
Bouyer Ln.	S. Fillmore	dead end	14.	315.	KirkwoodMO::Bouyer::001	4,410.00	AAC	E	**4**	
Boxelder Dr.	Ashwood	401/404 Ashwood	27.	1,000.	KirkwoodMO::BoxelderDr::001	27,000.00	PCC	E	**60**	
Chester Ave.	Kirkwood Rd.	S. Taylor	26.	520.	KirkwoodMO::Chester::001	13,520.00	AC	E	**47**	
Clark Ave.	Leffngwell	dead end at E. Eliott	26.	822.	KirkwoodMO::ClarkAve::001	21,372.00	PCC	E	**41**	
Clark Ave.	E. Argonne	dead end	22.	1,855.	KirkwoodMO::Clark::001	40,810.00	AC	E	**46**	
College Ave.	S. Clay	dead end	16.	260.	KirkwoodMO::College::001	4,160.00	AC	E	**100**	
Commerce Ave.	S. Taylor	S. Fillmore	25.	800.	KirkwoodMO::Commerce::001	20,000.00	AC	E	**45**	
Creekside Place	E. Clinton	cul de sac	26.	400.	KirkwoodMO::Creekside::001	10,400.00	PCC	E	**87**	
Dickson St.	E. Adams	E. Essex	24.	2,025.	KirkwoodMO::DicksonSt::002	48,600.00	AC	E	**46**	
Dickson St.	E. Argonne	E. Adams	25.	795.	KirkwoodMO::DicksonSt::001	19,875.00	AC	E	**100**	
Dickson St.	E. Argonne	E. Adams	25.	795.	KirkwoodMO::DicksonSt::000	19,875.00	AC	E	**66**	
E Woodbine Ave	Fillmore	E. side of S Taylor	24.	595.	KirkwoodMO::EWoodbine::002	13,560.00	PCC	E	**41**	
E Woodbine Ave	Kirkwood Rd	east curbline of Taylor	25.	924.	KirkwoodMO::EWoodbine::001	23,100.00	PCC	E	**52**	
E. Argonne Dr.	Kirkwood Rd east	west curbline N. Taylor	84.	625.	KirkwoodMO::EArgonn::001	52,500.00	AC	E	**48**	
E. Argonne Dr.	N. Taylor east curbline	Woodlawn	30.	1,925.	KirkwoodMO::EArgonn::002	57,750.00	AC	E	**59**	
E. Argonne Dr.	Woodlawn east curbline	Holmes	30.	1,665.	KirkwoodMO::EArgonn::003	49,950.00	AC	E	**77**	
E. Clinton Place	Kirkwood Rd	S. Taylor	24.	615.	KirkwoodMO::EClinton::001	14,760.00	PCC	E	**71**	
E. Clinton Place	S. Taylor	S. Fillmore	24.	591.	KirkwoodMO::EClinton::002	14,184.00	PCC	E	**56**	
E. Clinton Place	Leffingwell	dead nd	19.	760.	KirkwoodMO::EClinton::004	14,440.00	AC	E	**54**	
E. Clinton Place	S. Fillmore	Leffingwell	30.	860.	KirkwoodMO::EClinton::003	25,800.00	AC	E	**67**	
E. Elliot Ave.	Leffingwell	Clark	20.	975.	KirkwoodMO::EElliot::001	19,500.00	AC	E	**52**	
E. Elliott Ave.	Holmes	dead end	24.	563.	KirkwoodMO::EEliott::001	13,512.00	PCC	E	**46**	
E. Jefferson Ave.	Holmes	Dickson	24.	560.	KirkwoodMO::EJefferson::004	13,440.00	PCC	E	**52**	
E. Jefferson Ave.	Woodlawn	Dickson	25.	750.	KirkwoodMO::EJefferson::003	18,750.00	AAC	E	**54**	
E. Jefferson Ave.	N. Taylor	Woodlawn	25.	1,900.	KirkwoodMO::EJefferson::002	47,500.00	AC	E	**45**	
E. Madison Ave	Woodlawn	E. to Smith	24.	608.	KirkwoodMO::EMadison::003	14,592.00	PCC	E	**100**	
E. Madison Ave	Clark	Holmes	20.	680.	KirkwoodMO::EMadison::001	13,600.00	AC	E	**48**	
E. Madison Ave	Woodlawn	w. curbline Clark	25.	640.	KirkwoodMO::EMadison::002	16,000.00	AC	E	**45**	
E. Madison Ave	S. Fillmore	Smith	25.	630.	KirkwoodMO::EMadison::004	15,750.00	AC	E	**61**	
E. Madison Ave	S. Fillmore	S. Taylor	29.	680.	KirkwoodMO::EMadison::005	19,720.00	AC	E	**57**	
E. Monroe Ave.	Holmes	Woodlawn	25.	1,675.	KirkwoodMO::EMonroe::001	41,875.00	AC	E	**52**	
E. Monroe Ave.	Woodlawn	Gilbert/Scott	21.	940.	KirkwoodMO::EMonroe::002	19,740.00	AC	E	**78**	
E. Monroe Ave.	S. Taylor	S. Fillmore	36.	600.	KirkwoodMO::EMonroe::003	21,600.00	AC	E	**58**	
E. Monroe Ave.	Kirkwood Rd.	N.Taylor	36.	620.	KirkwoodMO::EMonroe::004	22,320.00	AC	E	**58**	
E. Rosehill Ave.	Kirwood Rd.	Fillmore	32.	1,350.	KirkwoodMO::ERosehill::001	43,200.00	AC	E	**48**	
Edgewood Ln.	E. Rosehill	Nipher parking lot	25.	225.	KirkwoodMO::Edgewood::001	5,625.00	AC	E	**100**	
Gilbert St.	E. Argonne	E. Madison	26.	355.	KirkwoodMO::Gilbert::001	9,230.00	AC	E	**42**	
Gilbert St.	E. Madison	E. Monroe	18.	435.	KirkwoodMO::Gilbert::002	7,830.00	AC	E	**35**	
Gordon Place	Big Bend	228 ft. N	26.5	228.	KirkwoodMO::GordonPl::001	6,042.00	PCC	E	**81**	
Grand Ave.	S. Harrison	Minnie	25.	890.	KirkwoodMO::Grand::002	22,250.00	AC	E	**49**	
Grand Ave.	Kirkwood Rd	Minnie	24.	477.	KirkwoodMO::Grand::001	11,448.00	PCC	E	**44**	
Handlan Ct.	E. Argonne	dead end	21.	160.	KirkwoodMO::Handlan::001	3,360.00	AC	E	**100**	
Heege Ave.	S. Harrison	S. Van Buren	21.	635.	KirkwoodMO::Heege::001	13,335.00	AC	E	**52**	
Hillcrest Place	W. Woodbine	dead end	26.	370.	KirkwoodMO::Hillcrest::001	9,620.00	AC	E	**53**	

Idlewild Place	S. Clay	Kirkwood Rd.	27.	630.	KirkwoodMO::Idlewild::001	17,010.00	AC	E	**100**
Kirkwood Rd.	RR Tracks north	MoDOT RW near Swan	44.	4,475.	KirkwoodMO::KirkwoodRd::002	196,900.00	AC	E	**65**
Kirkwood Rd.	RR tracks south	MoDOT ROW	44.	4,410.	KirkwoodMO::KirkwoodRd::001	194,040.00	AC	E	**52**
Lee Ave.	S. Harrison	S. Geyer	25.	1,290.	KirkwoodMO::Lee::001	32,250.00	AC	E	**67**
Leffingwell Ave.	Holmes	section 001 (APC)	24.	754.	KirkwoodMO::Leffngwell::002	18,096.00	PCC	E	**42**
Leffingwell Ave.	rr tracks south	section 002 (PCC)	23.	3,385.	KirkwoodMO::Leffingwel::001	77,855.00	AC	E	**68**
McCullough Ave.	S. Clay	S. Van Buren	26.	1,250.	KirkwoodMO::McCullough::001	32,500.00	AC	E	**62**
Midway Ave.	S. Harrison	dead end	19.	475.	KirkwoodMO::Midway::002	9,025.00	AC	E	**49**
Minnie Ave.	dead end	Grand	24.	477.	KirkwoodMO::MinnieAve::001	11,448.00	PCC	E	**45**
Miriam Ave.	Scott	dead end	22.	780.	KirkwoodMO::Miriam::001	17,160.00	AC	E	**69**
Mitchell Place	E. Argonne	E. Jefferson	25.	480.	KirkwoodMO::Mitchell::001	12,000.00	AC	E	**55**
Monroe Place	S. Geyer	S. Van Buren	21.	725.	KirkwoodMO::MonroePl::001	15,225.00	AC	E	**60**
N. Clay Ave	W. Argonne (south curbline)	W. Adams (south curbline)	37.	765.	KirkwoodMO::NClay::000	28,305.00	AC	E	**51**
N. Harrison Ave.	W. Argonne north	W. Adams (south curbline)	31.	730.	KirkwoodMO::NHarrison::001	22,630.00	AC	E	**40**
N. Taylor Ave.	E. Adams south	E. Argonne	36.	710.	KirkwoodMO::NTaylor::001	25,560.00	AC	E	**44**
N. Van Buren Ave.	W. Adams	W. Argonne	31.	730.	KirkwoodMO::NVanBuren::003	22,630.00	PCC	E	**100**
N. Woodlawn Ave.	E. Adams	E. Argonne	35.	1,600.	KirkwoodMO::NWoodlawn::004	52,675.00	AC	E	**46**
Norton Ave.	Lillian	dead end	24.	765.	KirkwoodMO::Norton::001	18,360.00	AC	E	**71**
Ohlman Ave.	Commerce	Gordon Place	27.	835.	KirkwoodMO::Ohlman::001	22,545.00	AC	E	**80**
Prospect Ave.	Kirkwood Rd.	dead end	24.	700.	KirkwoodMO::Prospect::001	16,800.00	AC	E	**50**
Reardon Dr	S. Fillmore	cul de sac	27.	630.	KirkwoodMO::Reardon::001	17,010.00	PCC	E	**47**
Rollingwood Ln	S Geyer	cul de sac	27.	620.	KirkwoodMO::Rollwood::001	16,740.00	PCC	E	**38**
Rose Ln.	S. Harrison	cul de sac	23.	1,140.	KirkwoodMO::Rose::001	29,250.00	PCC	E	**90**
S Fillmore Ave	Big Bend	555 ft N.	28.	555.	KirkwoodMO::SFillmore::001	15,540.00	PCC	E	**68**
S Fillmore Ave	Scott Ave. south	E. Clinton (south curbline)	36.	1,645.	KirkwoodMO::SFillmore::002	59,220.00	AC	E	**65**
S Fillmore Ave	Rosehill north	E. Clinton (south curbline)	37.	1,550.	KirkwoodMO::SFillmore::003	57,350.00	AC	E	**62**
S. Clay Ave.	W. Rose Hill	north curbline of W. Woodbine	24.	1,375.	KirkwoodMO::SClay::001	33,000.00	PCC	E	**84**
S. Clay Ave.	south curbline W. Argonne	north bridge approach @ RR tracks	25.	150.	KirkwoodMO::SClay::003	3,750.00	PCC	E	**61**
S. Clay Ave.	W. Woodbine (north curbline)	RR Bridge (south bent)	37.	2,055.	KirkwoodMO::SClay::002	76,035.00	AC	E	**52**
S. Elliot Ave.	Leffingwell	dead end	25.	1,125.	KirkwoodMO::SElliot::001	28,125.00	AC	E	**81**
S. Fillmore Ave	E. Argonne south	RR Tracks/Scott	26.	725.	KirkwoodMO::SFillmore::004	18,850.00	AC	E	**61**
S. Fillmore Ave	Section 001 (PCC)	dead end @ RRTracks	28.	465.	KirkwoodMO::SFillmore::005	13,020.00	AC	E	**41**
S. Geyer Rd. (NBL only)	W. Argonne	W. Madison	18.	480.	KirkwoodMO::SGeyer::007	8,640.00	AC	E	**45**
S. Harrison Ave.	W. Rose Hill	Lee	24.	359.	KirkwoodMO::SHarrison::002	8,616.00	PCC	E	**82**
S. Harrison Ave.	W. Woodbine	RR tracks	26.	1,865.	KirkwoodMO::SHarrison::004	48,490.00	AC	E	**63**
S. Harrison Ave.	W. Rosehill	Grand	22.	665.	KirkwoodMO::SHarrison::001	14,630.00	AC	E	**62**
S. Harrison Ave.	W. Woodbine	Lee (south curbline)	25.	975.	KirkwoodMO::SHarrison::003	24,375.00	AC	E	**67**
S. Harrison Ave.	W. Monroe (north curbline	RR Bridge (south bent)	32.	125.	KirkwoodMO::SHarrison::005	4,000.00	AC	E	**51**
S. Harrison Ave.	W. Argonne	RR Bridge (north bent)	31.	540.	KirkwoodMO::SHarrison::006	16,740.00	AC	E	**63**
S. Taylor Ave.	E. Woodbine north	E. Monroe	37.	1,640.	KirkwoodMO::STaylor::002	60,680.00	AC	E	**57**
S. Taylor Ave.	dead end @ RR Tracks	cul de sac	23.	975.	KirkwoodMO::STaylor::001	22,425.00	AC	E	**47**
S. Taylor Ave.	E. Argonne	E. Monroe	37.	708.	KirkwoodMO::STaylor::003	26,196.00	AC	E	**50**
S. Van Buren Ave.	W. Woodbine north	RR tracks	30.	1,380.	KirkwoodMO::SVanBuren::001	41,400.00	AC	E	**79**
S. Woodlawn Ave.	E. Adams south	Scott	24.	1,400.	KirkwoodMO::SWoodlawn::001	54,360.00	AC	E	**47**
Sante Ave.	S. Fillmore	dead end	24.	365.	KirkwoodMO::Sante::001	8,760.00	AC	E	**28**
Scott Ave.	S. Woodlawn @ eyebrow	S. Fillmore	22.	1,400.	KirkwoodMO::Scott::002	30,800.00	AC	E	**51**
Scott Ave.	Holmes	Woodlawn	24.	1,690.	KirkwoodMO::Scott::001	40,560.00	AC	E	**45**
Silver Ln.	McCullough (west leg)	McCullough (east leg)	25.	665.	KirkwoodMO::Silver::001	16,625.00	AC	E	**59**
Smith St.	E. Argonne	E. Monroe	25.	820.	KirkwoodMO::Smith::001	20,500.00	AC	E	**72**
Smith St.	E. Monroe	Scott	22.	200.	KirkwoodMO::Smith::002	4,400.00	AC	E	**57**
Thomas Ave.	S. Fillmore	dead end @ Nipher service road	19.	600.	KirkwoodMO::Thomas::001	11,400.00	AC	E	**63**
W. Argonne Dr.	N Harrison	N. geyer	30.	1,295.	KirkwoodMO::WArgonne::003	38,850.00	AAC	E	**71**

W. Argonne Dr.	N. Harrison	N. Clay	40.	615.	KirkwoodMO::WArgonne::002	24,600.00	AAC	E	**58**	
W. Argonne Dr.	N. Clay	N. Harrison	84.	625.	KirkwoodMO::WArgonne::001	52,500.00	AAC	E	**63**	
W. Clinton Place	Kirkwood Rd.	S. Clay	28.	635.	KirkwoodMO::WClinton::001	17,780.00	AC	E	**48**	
W. Jefferson Avenue	N. Clay	Kirkwood Rd	43.	625.	KirkwoodMO::WJefferson::004	26,875.00	AC	E	**43**	
W. Jefferson Avenue	N. geyer	w. curbline of Van Buren	25.	635.	KirkwoodMO::WJefferson::001	15,875.00	AC	E	**49**	
W. Jefferson Avenue	N Harrison	N Clay	35.	615.	KirkwoodMO::WJefferson::003	21,525.00	AC	E	**70**	
W. Jefferson Avenue	S. Van Buren	N. Harrison	25.	600.	KirkwoodMO::WJefferson::002	15,000.00	PCC	E	**40**	
W. Madison Ave.	Kirkwood Rd	S. Clay	33.	625.	KirkwoodMO::WMadison::003	20,625.00	PCC	E	**100**	
W. Madison Ave.	S. Van Buren	S. Harrison	25.	625.	KirkwoodMO::WMadison::002	15,625.00	AC	E	**55**	
W. Madison Ave.	S. Geyer	S. Van Buren	25.	655.	KirkwoodMO::WMadison::001	16,375.00	AC	E	**53**	
W. Monroe Ave.	Kirkwood Rd.	N. Clay (east curbline)	32.	625.	KirkwoodMO::WMonroe::001	20,000.00	AC	E	**61**	
W. Monroe Ave.	S. Clay (west curbline)	Bend next to RR Tracks	28.	825.	KirkwoodMO::WMonroe::002	23,100.00	AC	E	**72**	
W. Monroe Ave.	S. Van Buren (east curbline)	section 002 (bend at RR tracks)	24.	540.	KirkwoodMO::WMonroe::003	12,960.00	AC	E	**58**	
W. Monroe Ave.	S. Van Buren	S. Geyer	21.	645.	KirkwoodMO::WMonroe::004	13,545.00	AC	E	**67**	
W. Woodbine Ave.	Kirkwood Rd.	S. Geyer	34.	2,525.	KirkwoodMO::WWoodbine::001	85,850.00	AC	E	**65**	
Whitson Ave.	E. Clinton	dead end	20.	355.	KirkwoodMO::Whitson::001	7,100.00	AC	E	**52**	
Willow Ct.	W Woodbine	cul de sac	27.	280.	KirkwoodMO::Willow::001	7,560.00	AC	E	**44**	
						22.64			**58.3**	**118**
Adams Ln.	E. Adams	dead end	20.	370.	KirkwoodMO::Adams::001	7,400.00	AC	NE	**76**	
Alexandra Dr.	Belson Ct	cul de sac	27.	800.	KirkwoodMO::Alexandra::001	21,600.00	PCC	NE	**45**	
Alfred Ave.	Wood	dead end	25.	550.	KirkwoodMO::Alfred::001	13,750.00	AC	NE	**74**	
Ascot Ln.	Mariedale	cul de sac	27.	395.	KirkwoodMO::Ascot::001	10,665.00	PCC	NE	**98**	
Avery Ct.	Avery Dr.	Avery Ct.	27.	1,480.	KirkwoodMO::AveryCt::001	39,960.00	AC	NE	**77**	
Avery Dr.	N. Harrison	N. Clay	23.	680.	KirkwoodMO::AveryDr::001	15,640.00	AC	NE	**66**	
Bambury Way	Woodlawn	cul de sac	24.	1,362.	KirkwoodMO::Bambury::001	32,688.00	PCC	NE	**46**	
Barry Ct.	Wilson	cul de sac	27.	585.	KirkwoodMO::BarryCt::001	15,795.00	PCC	NE	**96**	
Barter Ave.	N. Geyer	Evans Ave.	19.	930.	KirkwoodMO::Barter::001	17,670.00	AC	NE	**34**	
Barter Ave.	Evans	N. Harrison	25.	370.	KirkwoodMO::Barter::002	9,250.00	AC	NE	**50**	
Barter Ave.	N. Harrison	Kirkwood Rd.	25.	695.	KirkwoodMO::Barter::003	17,375.00	AC	NE	**44**	
Belson Ct	Dickson St	cul de sac	27.	750.	KirkwoodMO::BelsonCt::001	20,250.00	PCC	NE	**54**	
Belva Ave.	Simmons	Evans	20.	506.	KirkwoodMO::Belva::001	10,120.00	AC	NE	**49**	
Bernice Ave.	Manchester Rd	Quan	21.	1,570.	KirkwoodMO::Bernice::001	32,970.00	AC	NE	**59**	
Bogey Ln.	N. Woodlawn	Club	24.	1,195.	KirkwoodMO::Bogey::001	28,680.00	AC	NE	**75**	
Brookhaven Ct	Dickson (west)	Southbrook Dr	27.	565.	KirkwoodMO::Brookhaven::002	15,255.00	APC	NE	**63**	
Brookhaven Ct	Dickson (east)	cul de sac	24.	840.	KirkwoodMO::Brookhaven::001	20,160.00	AAC	NE	**46**	
Brownell Ave.	Dickson	City Limits (Glendale)	27.	1,125.	KirkwoodMO::Brownell::001	30,375.00	AC	NE	**72**	
Central Place	N. Harrison	east side of Van Buren	30.	617.	KirkwoodMO::Central::001	18,510.00	PCC	NE	**35**	
Central Place	N. Geyer	Van Buren (west curbline)	31.	650.	KirkwoodMO::Central::002	20,150.00	AC	NE	**34**	
Charlene Dr.	Evans	N. Harrison	20.	260.	KirkwoodMO::Charlene::001	5,200.00	AC	NE	**43**	
Charlene Dr.	Simmons	Folger	22.	260.	KirkwoodMO::Charlene::002	5,720.00	AC	NE	**64**	
Chelsea Ave.	Dickson	Brownell	27.	880.	KirkwoodMO::ChelseaAve::001	23,760.00	AC	NE	**63**	
Chelsea Ct.	Chelsea Ave.	cul de sac	27.	200.	KirkwoodMO::ChelseaCt::001	5,400.00	AC	NE	**69**	
Churchill Ln.	N. Taylor	cul de sac	26.	575.	KirkwoodMO::Churchill::001	14,950.00	AC	NE	**82**	
Claybrook Ln.	Longview	cul de sac	24.	380.	KirkwoodMO::Claybrook::001	9,120.00	AC	NE	**100**	
Cleveland Ave.	W. Essex	Peeke	24.	1,367.	KirkwoodMO::Cleveland::001	32,808.00	PCC	NE	**93**	
Cleveland Ave.	Wilson	Peeke	20.	1,595.	KirkwoodMO::Cleveland::002	31,900.00	AC	NE	**59**	
Club Ln.	Longview	Par	24.	795.	KirkwoodMO::Club::001	19,080.00	AC	NE	**60**	
Cranbrook Dr.	Dickson (north leg)	Dickson (south leg)	27.	1,375.	KirkwoodMO::Cranbrook::001	37,125.00	AC	NE	**88**	
Crescent Dr.	Dickson	N/S Cresent (west curbline)	17.	280.	KirkwoodMO::Crescent::001	4,760.00	AC	NE	**64**	
Curran Ave.	Manchester Rd.	Quan	21.	1,540.	KirkwoodMO::Curran::001	32,340.00	AC	NE	**47**	
Delshire Ct.	E. Gill	cul de sac	22.	225.	KirkwoodMO::Delshire::001	4,950.00	AC	NE	**76**	

Dewberry Ct.	Quan	cul de sac	28.	300.	KirkwoodMO::Dewberry::001	8,400.00	PCC	NE	**82**
Dickson St.	E. Essex north	Greenridge Manor	20.	1,970.	KirkwoodMO::DicksonSt::003	39,400.00	AC	NE	**75**
Dickson St.	Manchester Rd. south	Greenridge Manor	22.	2,500.	KirkwoodMO::DicksonSt::004	55,000.00	AC	NE	**37**
Doerwood Ct.	N. Woodlawn	cul de sac	27.	885.	KirkwoodMO::DoerwoodCt::001	23,895.00	PCC	NE	**47**
Doorack Ln.	N. Clay	cul de sac	27.	600.	KirkwoodMO::Doorack::001	16,200.00	AC	NE	**48**
Douglas Ln.	E. Adams	dead end	18.	235.	KirkwoodMO::Douglas::001	4,230.00	AC	NE	**23**
Douglas Ln.	E. Adams	Douglas	19.	456.	KirkwoodMO::Douglas::002	8,664.00	AC	NE	**35**
Drury Ln.	Dickson	cul de sac	27.	415.	KirkwoodMO::Drury::001	11,205.00	APC	NE	**72**
E. Bodley	Kirkwood Rd.	N. Taylor	22.	638.	KirkwoodMO::EBodley::001	14,036.00	AC	NE	**31**
E. Bodley	N. Taylor	N. Woodlawn	22.	2,210.	KirkwoodMO::EBodley::002	48,620.00	AC	NE	**61**
E. Essex Ave.	Kirkwood Rd	N. Taylor	25.	645.	KirkwoodMO::EEssex::001	16,125.00	AC	NE	**87**
E. Essex Ave.	N. Woodlawn	City Limits Glendale	21.	1,700.	KirkwoodMO::EEssex::003	35,700.00	AC	NE	**81**
E. Essex Ave.	Longview	N. Woodlawn	27.	365.	KirkwoodMO::EEssex::002	9,855.00	AC	NE	**80**
E. Gill Ln.	N. Woodlawn	N. Fillmore	22.	1,285.	KirkwoodMO::EGill::001	28,270.00	AC	NE	**40**
E. Jefferson Ave.	N. Taylor	Kirkwood Rd	43.	625.	KirkwoodMO::EJefferson::001	26,875.00	AC	NE	**64**
E. Jewel Ave.	Kirkwood Rd	N. Taylor	24.	629.	KirkwoodMO::EJewel::001	15,096.00	PCC	NE	**55**
E. Maple Ave.	N. Taylor	dead end	20.	410.	KirkwoodMO::EMaple::002	8,200.00	AC	NE	**41**
E. Maple Ave.	Kirkwood Rd.	dead end	20.	185.	KirkwoodMO::EMaple::001	3,700.00	AC	NE	**65**
E. Mermod Ave.	Kirkwood Rd.	dead end	21.	385.	KirkwoodMO::Emermod::001	8,085.00	AC	NE	**46**
E. Sarah Ave.	Bernice	Kirkwood Rd	18.	1,150.	KirkwoodMO::ESarah::001	20,700.00	AC	NE	**55**
E. Washington Ave.	Kirkwood Rd	N. Taylor	33.	635.	KirkwoodMO::EWashingtn::001	20,955.00	AC	NE	**72**
E. Washington Ave.	N. Taylor	N. Fillmore	33.	605.	KirkwoodMO::EWashingtn::002	19,965.00	AC	NE	**64**
Earl Ave.	Manchester Rd.	dead end	20.	300.	KirkwoodMO::Earl::001	6,000.00	AC	NE	**61**
Eastwood Dr.	Dickson	Meadowridge	27.	1,025.	KirkwoodMO::EastwoodDr::001	27,675.00	PCC	NE	**93**
Erichson Place	Longview	cul de sac	26.	330.	KirkwoodMO::Erichson::001	8,580.00	AC	NE	**93**
Evans Ave	Wilson	Peeke	24.	1,575.	KirkwoodMO::Evans::002	37,800.00	PCC	NE	**91**
Evans Ave	Essex	Peeke	24.	1,350.	KirkwoodMO::Evans::001	32,400.00	PCC	NE	**45**
Evans Ave	Manchester Rd	Belva	22.	1,213.	KirkwoodMO::Evans::003	26,686.00	AC	NE	**76**
Fairway	N. Woodlawn	Club	24.	1,195.	KirkwoodMO::Fairway::001	28,680.00	AC	NE	**79**
Fairwood Ln.	Longview	cul de sac	24.	515.	KirkwoodMO::Fairwood::001	12,360.00	AC	NE	**54**
Fillmore Ln.	N. Fillmore	cul de sac	18.	731.	KirkwoodMO::Fillmore::001	13,158.00	AC	NE	**56**
Florist Ave,	Dickson	dead end	20.	442.	KirkwoodMO::Florist::001	8,840.00	AC	NE	**97**
Folger Ave.	Manchester	Belva	28.	1,240.	KirkwoodMO::Folger::001	34,720.00	AC	NE	**57**
Garden Ln.	Kirkwood Rd.	cul de sac	23.	838.	KirkwoodMO::Garden::001	19,274.00	AC	NE	**32**
Gaslite Ln.	Dickson	cul de sac	25.	775.	KirkwoodMO::Gaslite::001	19,375.00	AC	NE	**64**
Girard Place	N. Clay	cul de sac	31.	445.	KirkwoodMO::Girard::001	13,795.00	AC	NE	**41**
Glendover Dr.	Brownell	Chelsea Ave.	27.	645.	KirkwoodMO::Glendover::001	17,415.00	AC	NE	**76**
Greenleaf Dr.	N. Woodlawn	Longview	27.	1,120.	KirkwoodMO::Greenleaf::001	30,240.00	AC	NE	**63**
Greenridge Manor Ln.	Dickson	cul de sac	28.	490.	KirkwoodMO::GrnrdgMan::001	13,720.00	PCC	NE	**57**
Hartmann Ct.	Dickson	cul de sac	26.	358.	KirkwoodMO::Hartmann::001	9,308.00	PCC	NE	**100**
Hawbrook Ave.	Dickson	Parkwoods	20.	407.	KirkwoodMO::Hawbrook::002	8,140.00	PCC	NE	**63**
Hawbrook Ave.	Glendale City Limits	Parkwoods	20.	608.	KirkwoodMO::Hawbrook::003	12,160.00	PCC	NE	**60**
Hawbrook Ave.	Hawbrook	E. Adams/Lockwood	24.	780.	KirkwoodMO::Parkwood::001	18,720.00	AC	NE	**78**
Hawbrook Ave.	Hawbrook north	cul de sac	23.	890.	KirkwoodMO::Parkwood::002	20,470.00	AC	NE	**91**
Hawbrook Ave.	E. Essex	cul de sac	26.	495.	KirkwoodMO::Parkwood::003	12,870.00	AC	NE	**62**
Hawbrook Ct.	Hawbrrok Ave.	cul de sac	36.	180.	KirkwoodMO::HawbrookCt::001	6,480.00	AC	NE	**97**
Hawbrook Ln.	Dickson (south)	Dickson (north)	24.	465.	KirkwoodMO::HawbrookLn::001	11,160.00	AAC	NE	**96**
Hill Dr.	#28/30 Hill	#53 Hill	24.	720.	KirkwoodMO::HillDr::001	17,280.00	AC	NE	**60**
Hollywood Ln.	N. Taylor	Kirkwood Rd.	20.	650.	KirkwoodMO::Hollywood::001	13,000.00	APC	NE	**96**
Homewood Ln.	E. Bodley	cul de sac	25.	1,250.	KirkwoodMO::Homewood::001	31,250.00	AC	NE	**45**
Huntleigh Dr.	Lindbergh	Lynchester	31.	1,210.	KirkwoodMO::HunteigDr::001	37,510.00	APC	NE	**72**
Huntleigh Forest Dr.	Lindbergh	cul de sac	27.	745.	KirkwoodMO::Huntleigh::001	20,115.00	PCC	NE	**47**

Hyacinth Ct.	N. Clay	cul de sac	22.	480.	KirkwoodMO::Hyacinth::001	10,560.00	APC	NE	**43**
Julia Place	Wood	Woodlawn	23.	900.	KirkwoodMO::Julia::001	20,700.00	AC	NE	**89**
Lawn Ct.	Quan	cul de sac	27.	285.	KirkwoodMO::Lawn::001	7,695.00	APC	NE	**48**
Lewiston Dr.	Dickson	cul de sac	23.	1,240.	KirkwoodMO::Lewiston::001	28,520.00	AC	NE	**69**
Longview Blvd.	N. Taylor	Woodlawn	40.	2,350.	KirkwoodMO::Longview::001	94,000.00	AC	NE	**88**
Luther Ln.	Hawbrook south	City Limits	24.	400.	KirkwoodMO::Luther::001	9,600.00	AC	NE	**92**
Lynchester Ln.	Manchester Rd north	1262 Lynchester	31.	900.	KirkwoodMO::Lynchester::001	27,900.00	APC	NE	**72**
Manlyn Dr.	N. Talor	Kirkwood Rd.	32.	660.	KirkwoodMO::Manlyn::001	21,120.00	AC	NE	**54**
Mariedale Ct.	Manchester Rd	section 002 (AAC)	27.	200.	KirkwoodMO::Mariedale::001	5,400.00	PCC	NE	**44**
Mariedale Ct.	section 001	cul de sac	21.	545.	KirkwoodMO::Mariedale::002	11,445.00	AC	NE	**80**
Mariedale Dr.	Mariedale Ct.	Ascot	27.	534.	KirkwoodMO::MariedaleD::001	14,418.00	PCC	NE	**64**
Meadowridge Dr.	Dickson west	section 002 (PCC)	27.	670.	KirkwoodMO::MeadowgDr::001	18,090.00	AC	NE	**48**
Meadowridge Dr.	section 001 (AC)	Eastwood	27.	500.	KirkwoodMO::MeadowgDr::002	13,500.00	PCC	NE	**100**
Meadowridge Ln.	Dickson east to	cul de sac	27.	483.	KirkwoodMO::Meadowrdg::001	13,041.00	PCC	NE	**46**
Morningside Dr.	N. taylor	Kirkwood Rd.	24.	650.	KirkwoodMO::Morningsid::001	15,600.00	AC	NE	**53**
N. Clay Ave	Manchester	Wilson	26.	886.	KirkwoodMO::NClay::005	23,036.00	PCC	NE	**69**
N. Clay Ave	W. Adams	Peeke	28.	1,380.	KirkwoodMO::NClay::002	38,640.00	PCC	NE	**100**
N. Clay Ave	W. Adams	W. Essex	33.	2,000.	KirkwoodMO::NClay::001	66,000.00	AC	NE	**45**
N. Clay Ave	Wilson (south curbline)	Barter	24.	1,080.	KirkwoodMO::NClay::004	25,920.00	AC	NE	**60**
N. Clay Ave	Peeke (north curbline)	Barter (north curbline)	24.	560.	KirkwoodMO::NClay::003	13,440.00	APC	NE	**72**
N. Clay Ave	Manchester Rd north	Maple Hill (PCC)	20.	485.	KirkwoodMO::NClay::006	9,700.00	AC	NE	**80**
N. Crescent Dr.	Woodlawn	Cresent	17.	470.	KirkwoodMO::NCrescent::001	7,990.00	AC	NE	**65**
N. Dickson St.	Mariedale	cul de sac	27.	405.	KirkwoodMO::NDicksonSt::001	10,935.00	PCC	NE	**73**
N. Fillmore Ave.	E. Adams	E. Gill	33.	695.	KirkwoodMO::NFillmore::002	22,935.00	AC	NE	**49**
N. Harrison Ave.	Manchester south	Peek	24.	2,400.	KirkwoodMO::NHarrison::004	57,600.00	PCC	NE	**94**
N. Harrison Ave.	W. Adams	W. Essex	25.	1,990.	KirkwoodMO::NHarrison::002	49,750.00	AC	NE	**35**
N. Harrison Ave.	W. Essex	Peeke	31.	1,355.	KirkwoodMO::NHarrison::003	42,005.00	AC	NE	**85**
N. Harrison Ave.	Manchester Rd	dead end	23.	1,140.	KirkwoodMO::NHarrison::005	26,220.00	AC	NE	**64**
N. Holmes Ave.	E. Essex	dead end	24.	285.	KirkwoodMO::NHolmes::001	6,840.00	AC	NE	**100**
N. Taylor Ave.	Manlyn	Hollywood	24.	271.	KirkwoodMO::NTaylor::006	6,504.00	PCC	NE	**100**
N. Taylor Ave.	Manchester Rd. south	1384 ft. south	24.	1,384.	KirkwoodMO::NTaylor::007	33,216.00	PCC	NE	**91**
N. Taylor Ave.	Hollywood south	Swan	24.	964.	KirkwoodMO::NTaylor::005	23,136.00	PCC	NE	**93**
N. Taylor Ave.	620 N. Taylor	Swan	25.	1,315.	KirkwoodMO::NTaylor::004	32,875.00	AC	NE	**59**
N. Taylor Ave.	E. Adams	E. Washington	37.	345.	KirkwoodMO::NTaylor::002	12,765.00	AC	NE	**83**
N. Taylor Ave.	E. Washington (north curbline)	620 N. Taylor	26.	1,940.	KirkwoodMO::NTaylor::003	50,440.00	AC	NE	**58**
N. Van Buren Ave.	Adams	S. side of Way	24.	1,167.	KirkwoodMO::NVanBuren::002	28,008.00	PCC	NE	**38**
N. Van Buren Ave.	Essex	N. side of Way	24.	706.	KirkwoodMO::NVanBuren::001	16,944.00	PCC	NE	**53**
N. Woodlawn Ave.	E. Adams north	E. Essex (south curbline)	34.	2,035.	KirkwoodMO::NWoodlawn::001	69,190.00	AC	NE	**65**
N. Woodlawn Ave.	Manchester Rd. south	E. Essex	26.	4,805.	KirkwoodMO::NWoodlawn::002	124,930.00	AC	NE	**59**
N. Woodlawn Ave.	Manchester Rd north	City Limits	26.	1,126.	KirkwoodMO::NWoodlawn::003	29,276.00	AC	NE	**60**
Norfolk Dr.	Dickson	E. Essex	23.	1,025.	KirkwoodMO::Norfolk::001	23,575.00	AC	NE	**72**
Oak Glen Manor Ct.	Quan	cul de sac	24.	375.	KirkwoodMO::OakGlenMnr::001	9,000.00	PCC	NE	**68**
Oakcraft Dr.	Greenleaf	Longview	27.	455.	KirkwoodMO::Oakcraft::001	12,285.00	AC	NE	**43**
Oakley Ln.	Wood	Bernice	26.	445.	KirkwoodMO::Oakley::001	11,570.00	AC	NE	**81**
Oakside Ln.	Willow View Ln.	Huntleigh Forest	27.	621.	KirkwoodMO::Oakside::001	16,767.00	PCC	NE	**38**
Orrick Ln.	N. Taylor	E. Gill	20.	650.	KirkwoodMO::Orrick::001	13,000.00	AC	NE	**57**
Par Ln.	N. Woodlawn	cul de sac	24.	1,245.	KirkwoodMO::Par::001	29,880.00	AC	NE	**62**
Par Ln.	Woodlawn	cul de sac	24.	600.	KirkwoodMO::ParLn::001	14,400.00	AC	NE	**52**
Parkwoods Ave.	Hawbrook south	E. Adams/Lockwood	24.	780.	KirkwoodMO::Parkwoods::001	18,720.00	AC	NE	**78**
Parkwoods Ave.	Hawbrook north	cul de sac	23.	890.	KirkwoodMO::Parkwoods::002	20,470.00	AC	NE	**93**
Parkwoods Ave.	E. Essex south	cul de sac	26.	495.	KirkwoodMO::Parkwoods::003	12,870.00	AC	NE	**62**
Pearl Ave.	W. Essex	W. Jewel	25.	995.	KirkwoodMO::Pearl::001	24,875.00	AC	NE	**44**

Peeke Ave.	N. Harrison	Kirkwood Rd.	36.	1,330.	KirkwoodMO::Peeke::002	47,880.00	AC	NE	**45**
Peeke Ave.	N. geyer	N. Harrison (east curbline)	26.	1,365.	KirkwoodMO::Peeke::001	35,490.00	AC	NE	**72**
Pleasant Ct.	W. Washington	cul de sac	25.	300.	KirkwoodMO::Pleasant::001	7,500.00	AC	NE	**58**
Quan Ave	Woodlawn	Lawn	27.	204.	KirkwoodMO::Quan::002	5,508.00	PCC	NE	**19**
Quan Ave	N. Taylor	002 (PCC)	24.	1,755.	KirkwoodMO::Quan::001	42,120.00	AC	NE	**48**
Quanal Dr	Alfred Ave	cul de sac	27.	505.	KirkwoodMO::Quanal::001	13,635.00	PCC	NE	**100**
S. Crescent Dr.	Woodlawn	Cresent	17.	570.	KirkwoodMO::SCrescent::001	9,690.00	AC	NE	**46**
Seekamp Ave.	Woodlawn	Wood	17.	920.	KirkwoodMO::Seekamp::001	15,640.00	AC	NE	**99**
Simmons Ave.	W. Essex	Peeke	25.	1,365.	KirkwoodMO::Simmons::001	34,125.00	PCC	NE	**93**
Simmons Ave.	Manchester	Wilson	26.	557.	KirkwoodMO::Simmons::003	14,482.00	AC	NE	**65**
Simmons Ave.	Wilson	Peeke	24.	1,595.	KirkwoodMO::Simmons::001	38,280.00	AC	NE	**66**
Simmons Ave.	Manchester	dead end	26.	1,680.	KirkwoodMO::Simmons::004	43,680.00	AC	NE	**55**
Southbrook Dr.	Dickson (west)	Brookhaven Ct (002)	27.	615.	KirkwoodMO::Southbrook:001	16,605.00	APC	NE	**57**
Sturgis Dr.	Manchester	dead end	27.	520.	KirkwoodMO::Sturgis::001	14,040.00	AC	NE	**57**
Sunset Ln.	N. Taylor	cul de sac	23.	320.	KirkwoodMO::Sunset::001	7,360.00	AC	NE	**64**
Swan Ave.	N. Taylor	Kirkwood Rd.	30.	645.	KirkwoodMO::Swan::001	19,350.00	AC	NE	**65**
Sylvan Place	Manchester Rd	dead end	26.	510.	KirkwoodMO::Sylvan::001	13,260.00	AC	NE	**81**
Tarrymore Ln.	Kenmore	cul de sac	27.	480.	KirkwoodMO::Tarrymore::001	12,960.00	AC	NE	**67**
Taylor Estates	N. Taylor	cul de sac	27.	540.	KirkwoodMO::TaylorEst::001	14,580.00	AC	NE	**43**
Taylor Woods Dr.	N. Taylor (south leg)	N. Taylor (north leg)	28.	1,750.	KirkwoodMO::TaylorWood::001	49,000.00	AC	NE	**44**
Timbercrest Rd.	Huntleigh	237/1262 Lynchester	31.	1,330.	KirkwoodMO::Timbercres::001	41,230.00	APC	NE	**80**
W. Bodley Ave.	N. Clay	Kirkwood Rd.	24.	610.	KirkwoodMO::WBodley::001	14,640.00	AC	NE	**63**
W. Essex Ave.	207 ft west of N. Geyer	1277 ft west of N. Geyer	24.	1,070.	KirkwoodMO::WEssex::002	25,680.00	PCC	NE	**64**
W. Jewel Ave.	Kirkwood Rd	N. Clay	24.	645.	KirkwoodMO::WJewel::001	15,480.00	PCC	NE	**100**
W. Jewel Ave.	N. Clay	N. Harrison	25.	710.	KirkwoodMO::WJewel::002	17,750.00	AC	NE	**41**
W. Jewel Ave.	N. Harrison	N. Geyer	16.	1,170.	KirkwoodMO::WJewel::003	18,720.00	AC	NE	**43**
W. Maple Ave.	Kirkwood Rd.	N. Clay	25.	710.	KirkwoodMO::WMaple::001	17,750.00	AC	NE	**57**
W. Mermod Place	Kirkwood Rd	N. Clay	24.	710.	KirkwoodMO::WMermod::001	17,040.00	PCC	NE	**100**
W. Sarah Ave.	Kirkwood Rd	N. Clay	23.	715.	KirkwoodMO::WSarah::001	16,445.00	AC	NE	**62**
W. Washington Ave.	Van Buren	N. Harrison	24.	586.	KirkwoodMO::WWashingtn::003	14,064.00	PCC	NE	**57**
W. Washington Ave.	N. Geyer west	Sugar Creek Trail	24.	1,297.	KirkwoodMO::WWashingtn::005	31,128.00	PCC	NE	**33**
W. Washington Ave.	Kirkwood Rd.	N. Clay	34.	620.	KirkwoodMO::WWashingtn::001	21,080.00	AC	NE	**64**
W. Washington Ave.	N. Clay	N. Harrison	31.	620.	KirkwoodMO::WWashingtn::002	19,220.00	AC	NE	**57**
W. Washington Ave.	Van Buren	N. Geyer	25.	640.	KirkwoodMO::WWashingtn::004	16,000.00	APC	NE	**70**
Warrenton Dr.	Lewiston (south leg)	Lewiston (north leg)	23.	645.	KirkwoodMO::Warrenton::001	14,835.00	AC	NE	**74**
Way Ave.	Geyer	east cubline of Van Buren	27.	666.	KirkwoodMO::Way::002	17,982.00	PCC	NE	**71**
Way Ave.	N. Clay	Van Buren	25.	1,230.	KirkwoodMO::Way::001	30,750.00	AC	NE	**79**
Weatherfield Ct.	Dickson	cul de sac	27.	670.	KirkwoodMO::Wethrfield::001	18,090.00	AC	NE	**61**
Weston Oaks Ct.	Wood	cul de sac	26.	595.	KirkwoodMO::WestonOaks::001	15,470.00	PCC	NE	**95**
Westrick Ct.	E. Gill	cul de sac	21.	225.	KirkwoodMO::Westrick::001	4,725.00	AC	NE	**54**
Willow View Ln	Huntleigh Forest	1215 Willow View	27.	745.	KirkwoodMO::WillowView::001	20,115.00	PCC	NE	**49**
Wilson Ave.	N. Geyer	N. Clay	22.	1,915.	KirkwoodMO::Wilson::001	42,130.00	AC	NE	**59**
Wilson Ave.	N. Clay	Kirkwood Rd	22.	715.	KirkwoodMO::Wilson::002	15,730.00	AC	NE	**71**
Windrush Dr.	Dickson	cul de sac	25.	750.	KirkwoodMO::Windrush::001	18,750.00	AC	NE	**62**
Wood Ave.	Quan	Seekamp	24.	1,200.	KirkwoodMO::Wood::002	28,800.00	AC	NE	**91**
Wood Ave.	Manchester Rd	Quan	25.	1,585.	KirkwoodMO::Wood::001	39,625.00	AC	NE	**65**
Woodlawn Estates Dr.	Woodlawn	cul de sac	27.	410.	KirkwoodMO::WoodlawnEs::001	11,070.00	APC	NE	**52**
Woodlawn Grove Ln	Woodlawn	cul de sac	26.	365.	KirkwoodMO::WoodGrove::001	9,490.00	PCC	NE	**75**
Woodleaf Ct.	Woodlawn	cul de sac	27.	430.	KirkwoodMO::Woodleaf::001	11,610.00	APC	NE	**63**
Woodridge Rd.	Lynchester	Huntleigh	31.	1,100.	KirkwoodMO::Woodridge::001	34,100.00	APC	NE	**76**
Woodside Dr.	Bernice	Wood	26.	450.	KirkwoodMO::Woodside::001	11,700.00	AC	NE	**55**
Woodview Manor Ln	Woodlawn	cul de sac	26.	655.	KirkwoodMO::WodviewMnr::001	17,030.00	PCC	NE	**69**

						29.78			**64.8**	**186**
Applewood Dr.	Daugherty Ferry	bedford Oaks	27.	2,025.	KirkwoodMO::Applewood::001	54,675.00	AC	NW	**64**	
Bedford Oaks Dr.	Applewood	Bedford Oaks (002)	27.	645.	KirkwoodMO::BedfordOak::001	17,415.00	AC	NW	**65**	
Bedford Oaks Dr.	Daugherty Ferry	cul de sac	27.	1,090.	KirkwoodMO::BedfordOak::002	29,430.00	AC	NW	**56**	
Beethoven Dr.	W. Essex	Mozart	27.	825.	KirkwoodMO::Beethoven::001	22,275.00	PCC	NW	**93**	
Ben Davis Ln.	Lindemann	Twin Pine	27.	795.	KirkwoodMO::BenDavis::001	21,465.00	PCC	NW	**90**	
Black Twig Ln.	Lindemann	Ben Davis	37.	775.	KirkwoodMO::BlackTwig::001	28,675.00	PCC	NW	**95**	
Bluebonnet Ct.	Mistletoe (south)	311 ft. south	27.	311.	KirkwoodMO::Bluebonnet::001	8,397.00	PCC	NW	**97**	
Briar Meadow Ct.	Brookcreek Ln	cul de sac	27.	320.	KirkwoodMO::BriarMdwCt::001	8,640.00	PCC	NW	**64**	
Briarfarm Ln.	Lynkirk	cul de sac	27.	645.	KirkwoodMO::Briarfarm::001	17,415.00	PCC	NW	**71**	
Briarfarm Ln.	Lynkirk south	cul de sac	27.	645.	KirkwoodMO::Briarfarm::002	17,415.00	PCC	NW	**77**	
Bridelbrook Ln.	Lynkirk	Brookcreek	27.	1,226.	KirkwoodMO::Bridlebrok::001	33,102.00	PCC	NW	**62**	
Brookcreek Ln (Court)	Brrokcreek Ln	cul de sac	27.	300.	KirkwoodMO::BrookcrkCt::001	8,100.00	PCC	NW	**84**	
Brookcreek Ln.	Lynkirk	2039 2040 Ballas	27.	1,925.	KirkwoodMO::Brookcreek::001	51,975.00	PCC	NW	**67**	
Bryan Ave.	W. Essex	dead end	23.	1,025.	KirkwoodMO::Bryan::001	23,575.00	AC	NW	**55**	
Bryan Meadows Ct	Bryan Ave W. to	dead end	27.	445.	KirkwoodMO::BryanMdws::001	12,015.00	PCC	NW	**94**	
Burns Ave.	Central	Knierim	25.	905.	KirkwoodMO::Burns::001	22,625.00	AC	NW	**72**	
Central Ave.	S. Geyer	Goethe	26.	845.	KirkwoodMO::CentralAve::001	21,970.00	AC	NW	**58**	
Cherry St.	Woodgate Dr.	Ruth Dr.	27.	840.	KirkwoodMO::Cherry::001	22,680.00	APC	NW	**67**	
Cheswick Place	Lynkirk west curbline	cul de sac	27.	430.	KirkwoodMO::Cheswick::001	11,610.00	PCC	NW	**91**	
Chopin Dr.	Dougherty Ferry	W. Essex	27.	1,300.	KirkwoodMO::Chopin::001	35,100.00	PCC	NW	**49**	
Clemens Ave.	W. Essex	Goethe	24.	375.	KirkwoodMO::Clemens::001	9,000.00	AC	NW	**68**	
Clemens Ave.	Goethe	Knierim	20.	885.	KirkwoodMO::Clemens::002	17,700.00	AC	NW	**63**	
Clemens Ct.	Essex	cul-de-sac	28.	610.	KirkwoodMO::ClemensCt::001	17,080.00	PCC	NW	**91**	
Colonial Oak Ln.	Frances	cul de sac	27.	590.	KirkwoodMO::ColonialOa::001	15,930.00	AC	NW	**45**	
Cornhill Ln.	Lindeman	cul de sac	27.	725.	KirkwoodMO::Cornhill::001	19,575.00	AC	NW	**59**	
Creekbriar Ln.	Lynkirk	cul de sac	27.	475.	KirkwoodMO::Creekbriar::001	12,825.00	PCC	NW	**88**	
Daugherty Ferry Rd.	N. Geyer	Chopin (west curbline)	37.	3,240.	KirkwoodMO::DaughertyF::001	119,880.00	AC	NW	**54**	
Daugherty Ferry Rd.	Chopin (west curbline)	City Limits (Des Peres)	36.	5,980.	KirkwoodMO::DaughertyF::002	215,280.00	AC	NW	**64**	
Daughtery Place	Daugherty Ferry	cul de sac	26.	1,415.	KirkwoodMO::DaughertyP::001	36,790.00	AC	NW	**48**	
Delchester Ln.	Woodgate	Ruth	27.	885.	KirkwoodMO::Delchester::001	23,895.00	PCC	NW	**56**	
Dickens Ave.	Central ave.	Clements	23.	980.	KirkwoodMO::Dickens::001	22,540.00	AC	NW	**67**	
Dorchester Ave.	Linwood	Kirkshire	27.	546.	KirkwoodMO::Dorchester::001	14,742.00	PCC	NW	**81**	
Dovergate Dr.	Lockett	Woodgate	28.	1,127.	KirkwoodMO::Dovergate::001	31,556.00	PCC	NW	**53**	
Edgeworth Ave.	Linwood	Kirkshire	27.	505.	KirkwoodMO::Edgeworth::001	13,635.00	PCC	NW	**72**	
Elm Tree Ln.	Gabriel	cul de sac	26.	1,525.	KirkwoodMO::ElmTree::001	39,650.00	AC	NW	**71**	
Essex Ct.	W. Essex	cul de sac	26.	435.	KirkwoodMO::EssexCt::001	11,310.00	PCC	NW	**98**	
Frances Rd.	Lindeman	Daughtery Ferry	25.	1,330.	KirkwoodMO::Francis::001	33,250.00	AC	NW	**59**	
Gabriel Ct.	south leg of Gabriel Ct	Gabriel Dr.	27.	1,010.	KirkwoodMO::GabrielCt::001	27,270.00	PCC	NW	**57**	
Gabriel Dr.	W. Essex	section 002 (PCC)	27.	400.	KirkwoodMO::Gabriel Dr::001	10,800.00	AC	NW	**47**	
Gabriel Dr.	504 Gabriel Dr.	cul de sac	27.	1,775.	KirkwoodMO::Gabriel Dr::002	47,925.00	PCC	NW	**57**	
Goethe Ave.	W. Essex	Wilcox	24.	1,635.	KirkwoodMO::Goethe::001	39,240.00	AC	NW	**68**	
Grassy Ridge Rd.	west cul de sac	east cul de sac	21.	1,825.	KirkwoodMO::GrassyRidg::001	38,325.00	AC	NW	**60**	
Greening Ln.	Lindemann east	1406 Lynkirk	27.	990.	KirkwoodMO::Greening::001	26,730.00	PCC	NW	**68**	
Greening Ln.	Lindemann west	dead end	27.	630.	KirkwoodMO::Greening::002	17,010.00	PCC	NW	**83**	
Iris Ln.	W. Essex	cul de sac	24.	1,190.	KirkwoodMO::Iris::001	28,560.00	AC	NW	**60**	
Jasmine Ln.	Poinsetta	Bluebonnet	27.	635.	KirkwoodMO::Jasmine::001	17,145.00	APC	NW	**59**	
Jill Ct.	Dougherty Ferry	cul de sac	27.	315.	KirkwoodMO::Jill::001	8,505.00	PCC	NW	**96**	
Kimkirk Ct.	Lynkirk east curbline	cul de sac	27.	600.	KirkwoodMO::Kimkirk::001	16,200.00	PCC	NW	**89**	
Kings Cliff Rd.	Sunny	Twin Pine	27.	1,000.	KirkwoodMO::KingsCliff::001	27,000.00	PCC	NW	**95**	
Kirkshire Dr.	east curbline Ormond	Claridge Place	26.	1,473.	KirkwoodMO::Kirkshire::002	38,298.00	PCC	NW	**76**	

Knierim Place	N. Geyer	Clements	19.	1,135.	KirkwoodMO::Knierim::001	21,565.00	AC	NW	**74**
Lanyard Ln.	Dougherty Ferry	cul de sac	27.	785.	KirkwoodMO::Lanyard::001	21,195.00	PCC	NW	**73**
Laven-Del Ln	Mid-Meadows north	cul de sac	27.	1,465.	KirkwoodMO::LavenDel::001	39,555.00	PCC	NW	**35**
Laven-Del Ln	Mid-Meadows south	cul de sac	27.	685.	KirkwoodMO::LavenDel::002	18,495.00	PCC	NW	**42**
Lin Manor Dr.	Lockett	Sherilin	27.	435.	KirkwoodMO::LinManor::001	11,745.00	AC	NW	**35**
Lindeman Rd.	Daugherty Ferry	City Limits (Des Peres)	37.	3,320.	KirkwoodMO::Lindeman::001	122,840.00	AC	NW	**59**
Lindeman Rd.	Dougherty Ferry	W. Adams Ave.	27.	1,871.	KirkwoodMO::Lindeman::002	50,517.00	PCC	NW	**68**
Lindgate Dr.	Lindeman	Lockett	27.	2,060.	KirkwoodMO::Lindgate::001	55,620.00	AC	NW	**31**
Linwood Blvd.	N. Geyer	Claridge Place	27.	1,947.	KirkwoodMO::Linwood::001	52,569.00	PCC	NW	**72**
Lisa Ln.	Lindgate	cul de sac	27.	315.	KirkwoodMO::Lisa::001	8,505.00	AC	NW	**48**
Lockett Ln.	Locket Rd.	cul de sac @ Sherilin	19.	1,630.	KirkwoodMO::LockettLn::001	30,970.00	AC	NW	**55**
Lockett Rd.	Daugherty Ferry	Linmanor	36.	935.	KirkwoodMO::Lockett::001	33,660.00	AC	NW	**57**
Lockett Rd.	City Limits (Des Peres)	Linmanor	30.	905.	KirkwoodMO::Lockett::002	27,150.00	AC	NW	**51**
Longfellow Ave.	Central	Knierim	25.	940.	KirkwoodMO::Longfellow::001	23,500.00	AC	NW	**77**
Longfellow Ave.	Knierim	W. Washington	16.	345.	KirkwoodMO::Longfellow::002	5,520.00	AC	NW	**82**
Lynkirk Ln.	Lindemann east	1406 Lynkirk	27.	740.	KirkwoodMO::Lynkirk::001	19,980.00	PCC	NW	**64**
Lynkirk Ln.	Lindemann west	Cheswick Place	27.	1,960.	KirkwoodMO::Lynkirk::002	52,920.00	PCC	NW	**65**
Mendelssohn Dr.	Dougherty Ferry	Mozart	27.	640.	KirkwoodMO::Mendelsohn::001	17,280.00	PCC	NW	**53**
Mid-Meadows Ln.	N. Geyer	KW North Middle School	27.	311.	KirkwoodMO::MidMeadows::001	8,397.00	PCC	NW	**46**
Mindy Ln.	Lindgate	cul de sac	27.	280.	KirkwoodMO::Mindy::001	7,560.00	AC	NW	**51**
Missouri Ave.	N. side of Cherry	dead end	27.	367.	KirkwoodMO::Missouri::002	9,909.00	PCC	NW	**40**
Missouri Ave.	Manchester Rd	Cherry	26.	1,265.	KirkwoodMO::Missouri::001	32,890.00	AC	NW	**42**
Mistletoe Ln.	N. Geyer	Bluebonnet	27.	1,080.	KirkwoodMO::Mistletoe::001	29,160.00	PCC	NW	**95**
Mozart Dr.	Chopin	cul de sac	27.	930.	KirkwoodMO::Mozart::001	25,110.00	PCC	NW	**94**
N. Geyer Rd.	Manchester Rd.	City Limits (Frontenac)	23.	2,755.	KirkwoodMO::NGeyer::001	63,365.00	AC	NW	**75**
N. Geyer Rd.	Manchester Rd south	W. Essex	36.	3,570.	KirkwoodMO::NGeyer::002	128,520.00	AC	NW	**36**
N. Geyer Rd.	W. Adams (north curbline)	W. Essex (north curbline)	36.	1,990.	KirkwoodMO::NGeyer::003	71,640.00	AC	NW	**44**
Northlin Dr.	Lindgate (west leg)	Southlin	27.	670.	KirkwoodMO::Northlin::001	18,090.00	AC	NW	**45**
Oak Bluff Ln.	Frances	cul de sac (Colonial Oak)	27.	695.	KirkwoodMO::OakBluff::001	18,765.00	AC	NW	**48**
Ormond Dr.	Manchester south	Kirkshire	27.	236.	KirkwoodMO::Ormond::002	6,372.00	PCC	NW	**64**
Ormond Dr.	Linwood	Kirkshire	27.	460.	KirkwoodMO::Ormond::001	12,420.00	PCC	NW	**80**
Pamela Ln.	N. Geyer	cul de sac	27.	1,275.	KirkwoodMO::Pamela::001	34,425.00	PCC	NW	**45**
Plaza Terrace	Linwood	Kirkshire	27.	565.	KirkwoodMO::PlazaTerr::001	15,255.00	PCC	NW	**75**
Poinsetta Ln.	Daugherty Ferry	Mistletoe	25.	870.	KirkwoodMO::Poinsetta::001	21,750.00	APC	NW	**72**
Point Essex Ct.	W. Essex	cul de sac	27.	1,095.	KirkwoodMO::PointEssex::001	29,565.00	PCC	NW	**76**
Rieth Terrace	Daugherty Ferry north	cul de sac	20.	500.	KirkwoodMO::RiethTerr::001	10,000.00	AC	NW	**43**
Rieth Terrace	Daugherty Ferry south	Grassy Ridge	22.	1,150.	KirkwoodMO::RiethTerr::002	25,300.00	AC	NW	**62**
Romine Dr.	Manchester Rd	129 ft south	26.	129.	KirkwoodMO::Romine::002	3,354.00	PCC	NW	**51**
Ruth Dr.	Cherry St	Delchester	27.	1,174.	KirkwoodMO::Ruth::002	31,698.00	PCC	NW	**53**
Ruth Dr.	Manchester	Ruth (002)	25.	1,310.	KirkwoodMO::Ruth::001	32,750.00	AC	NW	**46**
Schubert Dr.	W. Essex	Elm Tree	26.	245.	KirkwoodMO::Schubert::001	6,370.00	AC	NW	**98**
Scottsdale Rd.	N. Geyer	cul de sac	25.	1,320.	KirkwoodMO::Scottsdale::001	33,000.00	AC	NW	**91**
Sherilin Dr.	Lockett Ln. (south)	Lockett Ln. (north)	27.	1,290.	KirkwoodMO::Sherilin::001	34,830.00	AC	NW	**48**
Southlin Dr.	Northlin (west leg)	Lindgate	27.	1,250.	KirkwoodMO::Southlin::001	33,750.00	AC	NW	**37**
Spring House Dr.	Reith Terrace (west curbline)	cul de sac	20.	1,490.	KirkwoodMO::SpringHous::001	29,800.00	AC	NW	**46**
St. Croix Ct.	Lockett east	cul de sac	25.	420.	KirkwoodMO::StCroix::001	10,500.00	AC	NW	**63**
St. Croix Ct.	Lockett west	cul de sac	25.	250.	KirkwoodMO::StCroix::002	6,250.00	AC	NW	**75**
Stable Ridge Dr.	Sunny (south curbline)	2nd cul de sac at Sunny	26.	1,030.	KirkwoodMO::Stablridge::001	26,780.00	PCC	NW	**95**
Sugar Creek Rd.	W. Adams	W. Washington	15.	380.	KirkwoodMO::SugarCrkRd::001	5,700.00	AC	NW	**28**
Sunny Dr.	Twin Pine	Stable Ridge	27.	1,834.	KirkwoodMO::Sunny::001	49,518.00	PCC	NW	**95**
Thornberry Ln	Daughtery Ferry	cul de sac	27.	690.	KirkwoodMO::Thornbry::001	18,630.00	PCC	NW	**47**
Trailcrest Ln.	Bridlebrook	Ballas	27.	1,000.	KirkwoodMO::Trailcrest::001	27,000.00	PCC	NW	**82**

Twin Pine Dr.	City Limits south	Kings Cliff	27.	800.	KirkwoodMO::TwinPine::001	21,600.00	PCC	NW	**95**	
View Woods Dr.	Lindemann east	cul de sac	21.	475.	KirkwoodMO::ViewWoods::001	9,975.00	PCC	NW	**95**	
View Woods Dr.	Lindemann west	cul de sac	21.	700.	KirkwoodMO::ViewWoods::002	14,700.00	PCC	NW	**95**	
Villa Gardens Dr.	N. Geyer	cul de sac	27.	730.	KirkwoodMO::VillaGardn::001	19,710.00	PCC	NW	**64**	
W. Essex Ave.	N. Geyer	section 003	24.	1,280.	KirkwoodMO::WEssex::002	25,680.00	PCC	NW	**64**	
W. Essex Ave.	Kirkwood Rd	N. Geyer	32.	2,580.	KirkwoodMO::WEssex::001	82,560.00	AC	NW	**39**	
W. Jewel Ave.	N. Geyer	cul de sac	24.	1,885.	KirkwoodMO::WJewel::004	45,240.00	AC	NW	**43**	
Wessel Farm Ct.	Hunters Field	cul de sac	26.	375.	KirkwoodMO::WesselFarm::001	9,750.00	PCC	NW	**87**	
Westchester Ct.	Ruth	east cul de sac	27.	400.	KirkwoodMO::Westchster::001	10,800.00	PCC	NW	**96**	
Westchester Ct.	Ruth	west cul de sac	27.	325.	KirkwoodMO::Westchster::002	8,775.00	PCC	NW	**26**	
Whitecliff Dr.	Lockett	Dovergate	26.	1,150.	KirkwoodMO::Whitecliff::001	29,900.00	PCC	NW	**98**	
Wilcox Ave.	W. Essex	dead end	24.	320.	KirkwoodMO::Wilcox::001	7,680.00	AC	NW	**80**	
Wilcox Ave.	Goethe	dead end	22.	1,135.	KirkwoodMO::Wilcox::002	24,970.00	AC	NW	**62**	
Winesap Ln.	Lindemann	Greening	27.	765.	KirkwoodMO::Winesap::001	20,655.00	PCC	NW	**43**	
Woodfield Manor Ct	Bryan Ave	cul de sac	27.	429.	KirkwoodMO::WoodfldMan::001	11,583.00	PCC	NW	**96**	
Woodfin Ct.	Grassy Ridge	cul de sac	22.	390.	KirkwoodMO::Woodfin::001	8,580.00	AC	NW	**59**	
Woodgate Dr.	Manchester Rd south	north curbline of Rochdale	27.	970.	KirkwoodMO::Woodgate::002	26,190.00	PCC	NW	**56**	
Woodgate Dr.	Manchester Rd. north	dead end	27.	2,554.	KirkwoodMO::Woodgate::001	68,958.00	PCC	NW	**49**	
						25.10			**61.8**	**121**
Aldridge St.	Milwaukee	cul de sac	26.	515.	KirkwoodMO::Aldridge::001	13,390.00	AC	S	**49**	
Alsobrook St.	Milwaukee east	Tolstoi	26.	1,220.	KirkwoodMO::Alsobrook::001	31,720.00	AC	S	**62**	
Attucks St	Milwaukee east	cul de sac	26.	1,315.	KirkwoodMO::Attucks::001	34,190.00	AC	S	**61**	
Attucks St	Milwaukee west	dead end	26.	360.	KirkwoodMO::Attucks::002	9,360.00	AC	S	**85**	
Boxwood Ln.	S. Geyer	cul de sac	20.	555.	KirkwoodMO::Boxwood::001	11,100.00	AC	S	**99**	
Charmwood Ct.	Charmwood Dr	cul de sac	20.	605.	KirkwoodMO::CharmwdCt::001	12,100.00	PCC	S	**80**	
Charmwood Dr.	Marshall	dead end	20.	1,411.	KirkwoodMO::CharmwdDr::001	28,220.00	PCC	S	**78**	
Chicago St.	Milwaukee	Orleans	26.	625.	KirkwoodMO::Chicago::001	16,250.00	AC	S	**71**	
Couch Ave.	Big Bend south	dead end	21.	830.	KirkwoodMO::CouchAve::003	17,430.00	AC	S	**95**	
Couch Ln.	Couch Ave	cul de sac	19.	300.	KirkwoodMO::CouchLn::001	5,700.00	AC	S	**64**	
Danworth Ct.	Danworth Ct	cul de sac	27.	525.	KirkwoodMO::DanwrthCt::002	14,175.00	PCC	S	**47**	
Danworth Ct.	Big Bend	cul de sac	27.	420.	KirkwoodMO::DanwrthCt::001	11,340.00	PCC	S	**49**	
Eastview Dr.	Big Bend	dead end	19.	275.	KirkwoodMO::Eastview::001	5,225.00	AC	S	**80**	
Electric St.	Milwaukee	Orleans	26.	620.	KirkwoodMO::Electric::001	16,120.00	AC	S	**62**	
Forest Ave.	section 001 (APC)	cul de sac	21.	1,235.	KirkwoodMO::Forest::002	25,935.00	PCC	S	**43**	
Forest Ave.	Big Bend	section 002 (PCC)	21.	2,640.	KirkwoodMO::Forest::001	55,440.00	AC	S	**73**	
Forest Glen Ln.	S. Geyer	dead end	21.	1,190.	KirkwoodMO::Forest Gle::001	24,990.00	AC	S	**92**	
Geyer Forest Dr.	S. Geyer	cul de sac	27.	1,695.	KirkwoodMO::GeyerFrst::001	45,765.00	PCC	S	**49**	
Glenford Ct.	Big Bend	cul de sac	27.	755.	KirkwoodMO::GlenfordCt::001	20,385.00	PCC	S	**95**	
Huthmaker Ave.	Big Bend	cul de sac	26.	985.	KirkwoodMO::Huthmaker::001	25,610.00	PCC	S	**59**	
Ivanhoe Woods St.	S. Geyer	cul de sac	27.	440.	KirkwoodMO::IvanhoWood::001	11,880.00	PCC	S	**54**	
Laurel Bend Ct.	Station Bend	cul de sac	26.	320.	KirkwoodMO::LaurelBend::001	8,320.00	PCC	S	**94**	
Lemp Rd.	Forest	Finlay Rd.	21.	4,380.	KirkwoodMO::Lemp::001	91,980.00	AC	S	**52**	
Lemp Rd.	Lemp Rd	cul de sac	19.	1,545.	KirkwoodMO::Lemp::002	29,355.00	AC	S	**56**	
Lillian Ave.	S. Fillmore	Elliott	18.	635.	KirkwoodMO::LillianAve::001	11,430.00	PCC	S	**45**	
Maeville Ct.	Big Bend	cul de sac	27.	300.	KirkwoodMO::Maeville::001	8,100.00	PCC	S	**68**	
Marbendale Ct.	Marshall	cul de sac	27.	525.	KirkwoodMO::Marbendale::001	14,175.00	PCC	S	**42**	
Marco Dr.	Forest	Wilton	22.	732.	KirkwoodMO::MarcoDr::001	16,104.00	PCC	S	**56**	
Meachum St.	Milwaukee east	dead end	26.	1,255.	KirkwoodMO::Meachum::001	32,630.00	AC	S	**72**	
Meachum St.	Milwaukee west	dead end	26.	385.	KirkwoodMO::Meachum::002	10,010.00	AC	S	**56**	
Memphis St.	Milwaukee	Orleans	26.	620.	KirkwoodMO::Memphis::001	16,120.00	AC	S	**56**	
Midway Ave.	S. Harrison	Minnie	24.	843.	KirkwoodMO::Midway::001	20,232.00	PCC	S	**42**	

Milwaukee Ave.	Big Bend	dead end at Lowe's	26.	2,235.	KirkwoodMO::Milwaukee::001	58,110.00	AC	S	**75**	
MoDoc Trail	S. Glenwood	dead end	15.	385.	KirkwoodMO::MoDoc::001	5,775.00	AC	S	**29**	
N. Signal Hills Dr.	Marshall Rd	cul de sac	19.	1,800.	KirkwoodMO::NSignalHil::001	34,200.00	AC	S	**39**	
Neffwold Ct.	Neffwold Ln	cul de sac	27.	390.	KirkwoodMO::NeffwoldCt::001	10,530.00	PCC	S	**74**	
Neffwold Ln.	Lemp Rd	cul de sac	27.	1,733.	KirkwoodMO::NeffwoldLn::001	46,791.00	PCC	S	**77**	
New York St.	Milwaukee east	cul de sac	26.	1,350.	KirkwoodMO::NewYork::001	35,100.00	AC	S	**70**	
New York St.	Milwaukee west	dead end	26.	390.	KirkwoodMO::NewYork::002	10,140.00	AC	S	**80**	
Oakshire Ct.	Oakshire Ln	cul de sac	26.	230.	KirkwoodMO::OakshireCt::001	5,980.00	PCC	S	**97**	
Oakshire Ln.	S. Geyer	dead end	24.	1,900.	KirkwoodMO::Oakshire::001	45,600.00	AC	S	**70**	
Orchard Ln.	Windsor (south curbline)	dead end	23.	2,640.	KirkwoodMO::Orchard::001	60,720.00	AC	S	**63**	
Orchard Ln.	Windsor (north curbline)	dead end	23.	725.	KirkwoodMO::Orchard::002	16,675.00	AC	S	**58**	
Orchard Way	Orchard	cul de sac	16.	765.	KirkwoodMO::Orchard Wa::001	12,240.00	AC	S	**42**	
Orleans St.	Attucks (south curbline)	Memphis	26.	1,935.	KirkwoodMO::Orleans ::001	50,310.00	AC	S	**52**	
Ponca Trail	Big Bend	Barberry	17.	1,935.	KirkwoodMO::PoncaTrail::001	32,895.00	AC	S	**71**	
S. Geyer Rd.	Big Bend	City Limits (Sunset Hills)	24.	2,585.	KirkwoodMO::SGeyer::001	62,040.00	AC	S	**72**	
S. Glenwood Ln.	RR Bridge (south bent)	dead end	20.	1,700.	KirkwoodMO::SGlenwood::002	34,000.00	AC	S	**58**	
S. Glenwood Ln.	RR Bridge (north bent)	Big Bend	29.	185.	KirkwoodMO::SGlenwood::001	5,365.00	AC	S	**59**	
S. Signal Hills dr.	Marshall Rd.	cul de sac	19.	1,525.	KirkwoodMO::SSignalHil::001	28,975.00	AC	S	**27**	
Saratoga St.	Milwaukee east	dead end	26.	1,220.	KirkwoodMO::Saratoga::001	31,720.00	AC	S	**72**	
Scarlet Bend Ct.	Staion Bend	cul de sac	26.	260.	KirkwoodMO::ScarletBen::001	6,760.00	PCC	S	**89**	
Station Bend Ln.	Big Bend	cul de sac	26.	900.	KirkwoodMO::StationBen::001	23,400.00	PCC	S	**89**	
Timberbrook Dr.	S. Glenwood	Marshall Rd.	27.	2,250.	KirkwoodMO::Timberbrok::001	60,750.00	AC	S	**47**	
Timberview Dr.	Timberbrook	cul de sac	26.	1,200.	KirkwoodMO::Timberview::001	31,200.00	AC	S	**48**	
Wilton Ln.	section 001 (APC)	CUL DE SAC	21.	1,400.	KirkwoodMO::WiltonLn::002	29,400.00	PCC	S	**95**	
Wilton Ln.	Forest	section 002 (PCC)	20.	1,930.	KirkwoodMO::WiltonLn::001	38,600.00	AC	S	**55**	
Windsor Ln.	Orchard (west curbline)	S. Geyer	21.	1,015.	KirkwoodMO::Windsor::001	21,315.00	AC	S	**49**	
Windsor Spring Ct.	Windsor Spring Rd.	cul de sac	27.	350.	KirkwoodMO::WindsrSprg::001	9,450.00	PCC	S	**96**	
						10.95			**63.6**	**58**
Alphonse Dr.	S Geyer	Heman	26.	345.	KirkwoodMO::AlphonseDr::001	8,970.00	PCC	W	**59**	
Altus Place	Ann	dead end	25.	1,435.	KirkwoodMO::Altus::001	35,875.00	AC	W	**73**	
Altus Place	Ann south	dead end	24.	115.	KirkwoodMO::Altus::002	2,760.00	AC	W	**83**	
Andrews Ave.	W. Woodbine	Rosehill	26.	1,320.	KirkwoodMO::Andrews::001	34,320.00	AC	W	**83**	
Ann Ave.	Couch	Ballas	22.	2,713.	KirkwoodMO::Ann::001	59,686.00	PCC	W	**95**	
Arminda Ave.	W. Woodbine south	Thursby	21.	790.	KirkwoodMO::Arminda::001	16,590.00	AC	W	**91**	
Arminda Ave.	Virginia	Edna	21.	790.	KirkwoodMO::Arminda::002	16,590.00	AC	W	**86**	
Art Ln.	W Woodbine	cul de sac	27.	280.	KirkwoodMO::Art::001	7,560.00	AC	W	**50**	
Bach Ave.	Ballas	Hoffman	24.	1,325.	KirkwoodMO::Bach::001	31,800.00	AC	W	**42**	
Bach Ave.	Bach (001) south	Boaz	26.	735.	KirkwoodMO::Bach::002	19,110.00	AC	W	**58**	
Bach Ave.	W. Woodbine north	dead end	24.	510.	KirkwoodMO::Bach::003	12,240.00	AC	W	**80**	
Barberry Ln	Big Bend N.	Briargate	24.	197.	KirkwoodMO::Barberry::001	4,728.00	PCC	W	**83**	
Barberry Ln	Briargate	dead end	14.	118.	KirkwoodMO::Barberry::002	1,652.00	PCC	W	**39**	
Barberry Ln	Sweetbriar	E. Glenwood	18.	520.	KirkwoodMO::Barberry::003	9,360.00	PCC	W	**64**	
Barberry Ln	Big Bend south 218 ft.	cul de sac	27.	1,420.	KirkwoodMO::Barberry::004	38,340.00	PCC	W	**81**	
Barby Ln.	Old Big Bend	cul de sac	27.	700.	KirkwoodMO::Barby::0001	18,900.00	AC	W	**65**	
Boaz Ave.	Ballas	Emmerson	21.	2,200.	KirkwoodMO::Boaz::001	46,200.00	AC	W	**36**	
Briar Green Ct.	Big Bend	cul de sac	27.	647.	KirkwoodMO::BriarGreen::001	17,469.00	PCC	W	**82**	
Briarcreek Dr.	Nelda	cul de sac	27.	970.	KirkwoodMO::Briarcreek::001	26,190.00	PCC	W	**56**	
Briargate Ln.	E. Glenwood	W. Glenwood	24.	1,440.	KirkwoodMO::Briargate::001	21,600.00	PCC	W	**78**	
Briargate Ln.	E. glenwood	Cedarbrook (by I-270)	24.	343.	KirkwoodMO::Briargate::002	8,232.00	PCC	W	**91**	
Caroline Ave.	W. Woodbine	Nirk	24.	780.	KirkwoodMO::Caroline::002	18,720.00	PCC	W	**96**	
Caroline Ave.	Nirk	cul de sac	26.	800.	KirkwoodMO::Caroline::001	20,800.00	PCC	W	**57**	

Cedarbrook Ln.	Briargate north to	Briargate (by I-270)	24.	885.	KirkwoodMO::Cedarbrook::001	21,240.00	PCC	W	**61**
Cheviot Ct.	Culloden	Cheviot	25.	1,300.	KirkwoodMO::Cheviot::001	32,500.00	PCC	W	**96**
Chippendale Ct	Rosehill	cul de sac	27.	435.	KirkwoodMO::Chipendale::001	11,745.00	PCC	W	**47**
Claridge Place	Linwood	Kirkshire	27.	569.	KirkwoodMO::ClaridgePl::001	15,363.00	PCC	W	**59**
Couch Ave.	W. Adams	W. Rosehill	26.	4,500.	KirkwoodMO::CouchAve::001	117,000.00	AC	W	**78**
Couch Ave.	Big Bend	W. Rosehill	45.	1,275.	KirkwoodMO::CouchAve::002	57,375.00	AC	W	**85**
Coulter Ave.	W. Woodbine	dead end	21.	1,300.	KirkwoodMO::Coulter::001	27,300.00	AC	W	**47**
Coulter Forest	Coulter	cul de sac	26.	825.	KirkwoodMO::CoulterFrs::001	21,450.00	PCC	W	**78**
Coverdale Ln.	W. Woodbine	cul de sac	26.	320.	KirkwoodMO::Coverdale::001	8,320.00	PCC	W	**88**
Craig Forest Ln	Craig Rd	cu de sac	26.5	1,375.	KirkwoodMO::CraigForst::001	36,437.50	PCC	W	**88**
Craig Rd.	Woodbine/Craig split	Old Big Bend/Ballas	30.	4,250.	KirkwoodMO::Craig::001	127,500.00	AC	W	**65**
Craigvale Ct.	Craigwoods Dr.	cul-de-sc	24.	851.	KirkwoodMO::Craigvale::001	20,424.00	PCC	W	**81**
Craigwoods Dr.	Craig Rd.	cul-de-sac	24.	1,351.	KirkwoodMO::Craigwoods::001	32,424.00	PCC	W	**87**
Crest Ave.	Nirk south	W. Woodbine	25.	775.	KirkwoodMO::CrestAve::002	19,375.00	AC	W	**59**
Crest Ave.	Nirk	cul de sac	27.	900.	KirkwoodMO::CrestAve::001	24,300.00	PCC	W	**66**
Crest Ct.	W. Woodbine	cul de sac	27.	660.	KirkwoodMO::CrestCt::001	17,820.00	PCC	W	**45**
Culloden Rd.	Trossock	St. Giles	25.	1,308.	KirkwoodMO::Culloden::001	32,700.00	PCC	W	**96**
DuBois Ct	Craigwoods Dr	cul-de-sac	24.	565.	KirkwoodMO::DuBoisCt::001	13,560.00	PCC	W	**88**
DuBray Ct.	Craigwoods Dr.	cul-de-sac	24.	576.	KirkwoodMO::DuBray::001	13,824.00	PCC	W	**69**
Duley Ave.	Couch	Freida	25.	685.	KirkwoodMO::Duley::001	17,125.00	AC	W	**75**
E. Glenwood Ln.	Big Bend	west curbline W. Glenwood	23.	2,520.	KirkwoodMO::EGlenwood::001	57,960.00	PCC	W	**63**
Edna Ave.	W. Woodbine south	Old Big Bend	26.	2,765.	KirkwoodMO::Edna::001	71,890.00	AC	W	**73**
Embassy Ct.	Lark	cul de sac	27.	687.	KirkwoodMO::Embassy::001	18,549.00	PCC	W	**36**
Emmerson Ave.	Westview	dead end	20.	1,235.	KirkwoodMO::Emmerson::001	24,700.00	AC	W	**30**
Enola Ave.	Bach	Windy Hill	28.	275.	KirkwoodMO::Enola::001	7,700.00	AC	W	**51**
Enola Ct.	Enola Ave	cul de sac	27.	504.	KirkwoodMO::EnolaCt::001	13,608.00	PCC	W	**97**
Erber Dr.	W. Woodbine	Alphonse	24.	445.	KirkwoodMO::Erber::001	10,680.00	PCC	W	**71**
Ferncliff Ln.	W. Glenwood	dead end	24.	661.	KirkwoodMO::Ferncliff::001	15,864.00	PCC	W	**93**
Friar Ln.	Coulter	Robin Hood	24.	810.	KirkwoodMO::FriarLn::001	19,440.00	PCC	W	**94**
Frieda Ave.	Ann	dead end	21.	1,375.	KirkwoodMO::Frieda::001	28,875.00	AC	W	**72**
Frieda Ave.	Ann south	dead end	18.	295.	KirkwoodMO::Frieda::002	5,310.00	AC	W	**78**
George Ave.	Nirk	dead end	26.	500.	KirkwoodMO::George::001	13,000.00	AC	W	**66**
George Ave.	Nirk south	W. Woodbine	25.	775.	KirkwoodMO::George::002	19,375.00	AC	W	**57**
Grandview Dr.	Couch	Old Big Bend	24.	1,675.	KirkwoodMO::Grandview::001	40,200.00	AC	W	**97**
Harvey St.	Granview	Big Bend	24.	445.	KirkwoodMO::Harvey::001	10,680.00	AC	W	**100**
Heatherbrook Ln.	W. Glenwood (north leg)	W. Glenwood (south leg)	24.	1,565.	KirkwoodMO::Hethrbrook::001	37,560.00	PCC	W	**84**
Heman Dr.	W. Woodbine	Alphonse	26.	465.	KirkwoodMO::HemanDr::001	12,090.00	PCC	W	**52**
Hickory Hollow Ln.	W. Woodbine	cul de sac	27.	645.	KirkwoodMO::HickHollow::001	17,415.00	PCC	W	**96**
Horseshoe Dr.	Lark (west leg)	Lark (east leg)	22.	2,660.	KirkwoodMO::Horseshoe::001	58,520.00	AC	W	**54**
Hunters Field Rd.	Ballas	cul de sac	26.	975.	KirkwoodMO::HuntersFld::001	25,350.00	PCC	W	**72**
Huntwood Ln.	W. Rose Hill Ave.	cul de sac	27.	575.	KirkwoodMO::Huntwood::001	15,525.00	PCC	W	**32**
Janet Place	Ballas west	Edna	20.	1,155.	KirkwoodMO::Janet::001	23,100.00	AC	W	**81**
Janis Lynn Ct.	Couch	cul de sac	27.	325.	KirkwoodMO::JanisLynn::001	8,775.00	PCC	W	**96**
Joe Ave.	Ann	dead end	24.	400.	KirkwoodMO::Joe::001	9,600.00	AC	W	**69**
Kinyon Ct.	Craig Dr.	cul de sac	24.	650.	KirkwoodMO::KinyonCt::001	15,600.00	PCC	W	**94**
Lark Ave.	Couch	cul de sac	23.	2,675.	KirkwoodMO::Lark::001	61,525.00	AC	W	**55**
Lavina Place	Thusby	Virginia	20.	425.	KirkwoodMO::Lavina::001	8,500.00	AC	W	**85**
Lily Ave.	Emmerson	dead end	18.	170.	KirkwoodMO::Lily::001	3,060.00	AC	W	**38**
Lynda Ct.	Craig Dr.	cul de sac	27.	450.	KirkwoodMO::LyndaCt::001	12,150.00	PCC	W	**68**
Magnolia Ave.	W. Woodbine	Nirk	28.	766.	KirkwoodMO::Magnolia::001	21,448.00	AC	W	**44**
Maple Hill Ln.	Willow View	N. Clay	27.	870.	KirkwoodMO::MapleHill::001	23,490.00	PCC	W	**94**
Marjean Ct.	Big Bend (east leg)	Big Bend (west leg)	25.	400.	KirkwoodMO::Marjean::001	10,000.00	AC	W	**100**

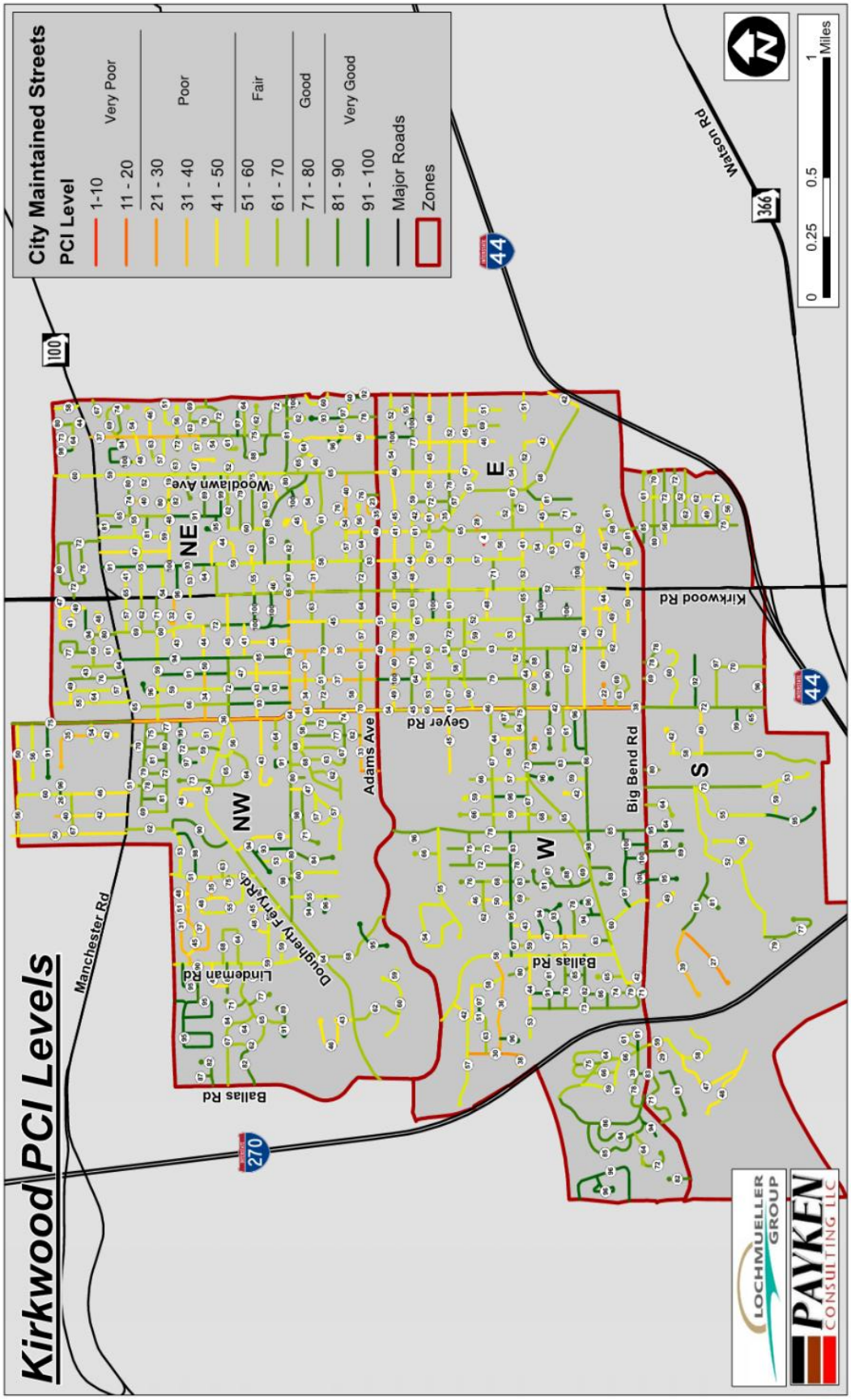
Maybrook Ln.	1st cul de sac @ Maybrook	2nd cul de sac	26.	1,042.	KirkwoodMO::Maybrook::002	27,092.00	PCC	W	**72**
Maybrook Ln.	Heatherbrook	cul de sac	27.	865.	KirkwoodMO::Maybrook::001	23,355.00	AC	W	**64**
McClain Ln.	W. Rosehill (west leg)	S. Geyer	18.	1,065.	KirkwoodMO::McClainLn::001	19,170.00	AC	W	**96**
McKinley Ave.	Magnolia	dead end	25.	610.	KirkwoodMO::McKinley::001	15,250.00	AC	W	**58**
Meyer Ave.	Ann south	W. Woodbine	23.	400.	KirkwoodMO::Meyer::001	9,200.00	AC	W	**43**
Millbrook Ln	Thorncliff Ln	E. Glenwood Ln	24.	530.	KirkwoodMO::Millbrook::001	12,720.00	PCC	W	**75**
N. Geyer Rd.	W. Adams (north curbline)	W. Argonne (south curbline)	36.	770.	KirkwoodMO::NGeyer::004	27,720.00	AC	W	**54**
Nelda Ave.	Ann south	dead end	23.	400.	KirkwoodMO::Nelda::001	9,200.00	AC	W	**83**
Nelda Ave.	Ann north	section 003 (PCC)	20.	645.	KirkwoodMO::Nelda::002	12,900.00	AC	W	**68**
Nelda Ave.	645 ft. north of Ann	cul de sac	24.	580.	KirkwoodMO::Nelda::003	13,920.00	PCC	W	**73**
Nirk Ave.	S. Geyer	Couch	21.	2,645.	KirkwoodMO::Nirk::001	55,545.00	AC	W	**67**
Old Big Bend Rd.	Big Bend	section 001 (PCC) Tamar	32.	2,450.	KirkwoodMO::OldBigBend::002	78,400.00	AC	W	**66**
Old Big Bend Rd.	Big Bend	Taman Ct	36.	352.	KirkwoodMO::OldBigBend::001	12,672.00	PCC	W	**51**
Porter Ave.	W. Woodbine	Ann	18.	380.	KirkwoodMO::Porter::001	6,840.00	PCC	W	**66**
Regent Terrace	Linwood	Kirkshire	27.	482.	KirkwoodMO::RegentTerr::001	13,014.00	PCC	W	**78**
Repetto Ln.	Old Big Bend	cul de sac	26.	120.	KirkwoodMO::RepettoLn::001	3,120.00	PCC	W	**51**
Repetto Ln.	section 001 (PCC)	cul de sac	27.	375.	KirkwoodMO::RepettoLn::002	10,125.00	AC	W	**74**
Robert Place	Grandvie	Big Bend	24.	400.	KirkwoodMO::Robert::001	9,600.00	AC	W	**100**
Robin Hood Ct.	Coulter	cul de sac	24.	975.	KirkwoodMO::RobinHood::001	23,400.00	PCC	W	**93**
Rochdale Dr.	Dougherty Ferry	Dovergate	27.	1,775.	KirkwoodMO::Rochdale::001	47,925.00	PCC	W	**89**
Romine Dr.	Linwood	Kirkshire	27.	525.	KirkwoodMO::Romine::001	14,175.00	PCC	W	**70**
Rosewood Ln.	S. Geyer	cul de sac	26.	1,006.	KirkwoodMO::Rosewood::001	26,156.00	PCC	W	**85**
S. Ballas Rd.	Ballas/Adams (Sugar Creek)	Old Big Bend	25.	4,750.	KirkwoodMO::SBallas::001	118,750.00	AC	W	**58**
S. Geyer Rd (SBL only)	W. Argonne south	Madison	28.	480.	KirkwoodMO::SGeyer::006	13,440.00	PCC	W	**65**
S. Geyer Rd.	Big Bend	W. Rosehill (north curbline)	45.	1,215.	KirkwoodMO::SGeyer::002	54,675.00	AC	W	**38**
S. Geyer Rd.	W. Woodbine (south curbline)	W. Rosehill (north curbline)	36.	1,318.	KirkwoodMO::SGeyer::003	47,448.00	AC	W	**42**
S. Geyer Rd.	W. Woodbine (north curbline)	RR Tracks	36.	1,200.	KirkwoodMO::SGeyer::004	43,200.00	AC	W	**46**
S. Geyer Rd.	RR Tracks north	W. Madison (south curbline)	36.	863.	KirkwoodMO::SGeyer::005	31,068.00	AC	W	**41**
S. Van Buren Ave.	W. Argonne	dead at RR tracks	24.	1,005.	KirkwoodMO::SVanBuren::002	24,120.00	AC	W	**64**
Shands Ct.	Kinyon Ct	cul de sac	20.	600.	KirkwoodMO::ShandsCt::001	12,000.00	PCC	W	**96**
St. Giles Rd.	1338 ft E of Trossock	Culloden	25.	620.	KirkwoodMO::StGiles::001	15,500.00	PCC	W	**96**
Sweetbriar Ln.	E. Glenwood (south leg)	E. Glenwood (north leg)	18.	1,370.	KirkwoodMO::Sweetbriar::001	24,660.00	PCC	W	**59**
Symphony Hill Ct.	Boaz	cul de sac	26.	545.	KirkwoodMO::SymphnyHil::001	14,170.00	PCC	W	**96**
Taman Ct.	Old Big Bend	cul de sac	27.	360.	KirkwoodMO::Taman::001	9,720.00	PCC	W	**36**
Thorncliff Ln.	E. Glenwood (north leg)	E. Glenwood (south leg)	24.	1,737.	KirkwoodMO::Thorncliff::001	41,688.00	PCC	W	**62**
Thursby Ave.	Ballas east	Coulter	19.	400.	KirkwoodMO::Thursby::002	7,600.00	AC	W	**37**
Thursby Ave.	Ballas west	Edna	21.	1,150.	KirkwoodMO::Thursby::001	24,150.00	AC	W	**76**
Trossock Ln.	1275 ft. E of Barrett Station	Culloden	25.	300.	KirkwoodMO::Trossock::001	7,500.00	PCC	W	**96**
Virginia Ln.	Ballas west	Edna	21.	1,160.	KirkwoodMO::Virginia::001	24,360.00	AC	W	**82**
W. Glenwood Ln	Big Bend Rd	N. to Highland	24.	2,310.	KirkwoodMO::WGlenwood::001	55,440.00	PCC	W	**83**
W. Monroe Ave.	S. Geyer	park entrance (low water crossing)	25.	1,365.	KirkwoodMO::WMonroe::005	34,125.00	AC	W	**45**
W. Rosehill Ave.	Couch	Craig	32.	530.	KirkwoodMO::WRosehill::001	16,960.00	AAC	W	**98**
W. Rosehill Ave.	Couch	S. Geyer	41.	2,690.	KirkwoodMO::WRosehill::002	110,290.00	AC	W	**86**
W. Rosehill Ave.	S. Geyer east	Kirkwood Rd.	28.	2,590.	KirkwoodMO::WRosehill::003	72,520.00	AC	W	**46**
W. Woodbine Ave.	Porter	Meyer (dead end)	21.	475.	KirkwoodMO::WWoodbine::006	9,975.00	AC	W	**53**
W. Woodbine Ave.	Ballas east	east curbline of Coulter	21.	180.	KirkwoodMO::WWoodbine::004	3,780.00	PCC	W	**59**
W. Woodbine Ave.	Ballas west	1090 ft.	25.	1,090.	KirkwoodMO::WWoodbine::005	27,250.00	PCC	W	**44**
W. Woodbine Ave.	Couch	Craig	36.	1,160.	KirkwoodMO::WWoodbine::003	41,760.00	AAC	W	**67**
W. Woodbine Ave.	S. Geyer (west curbline)	Craig Rd split	54.	1,545.	KirkwoodMO::WWoodbine::002	83,430.00	AC	W	**73**
Westview Ave.	Bach	cul de sac	23.	2,000.	KirkwoodMO::Westview::001	46,000.00	AC	W	**57**
Wildwood Ln.	W. Glenwood	Heatherbrook	22.	1,747.	KirkwoodMO::Wildwood::001	38,434.00	PCC	W	**85**
Windgrove Rd.	Ann	Briarcreek	27.	615.	KirkwoodMO::Windgrove::001	16,605.00	PCC	W	**41**

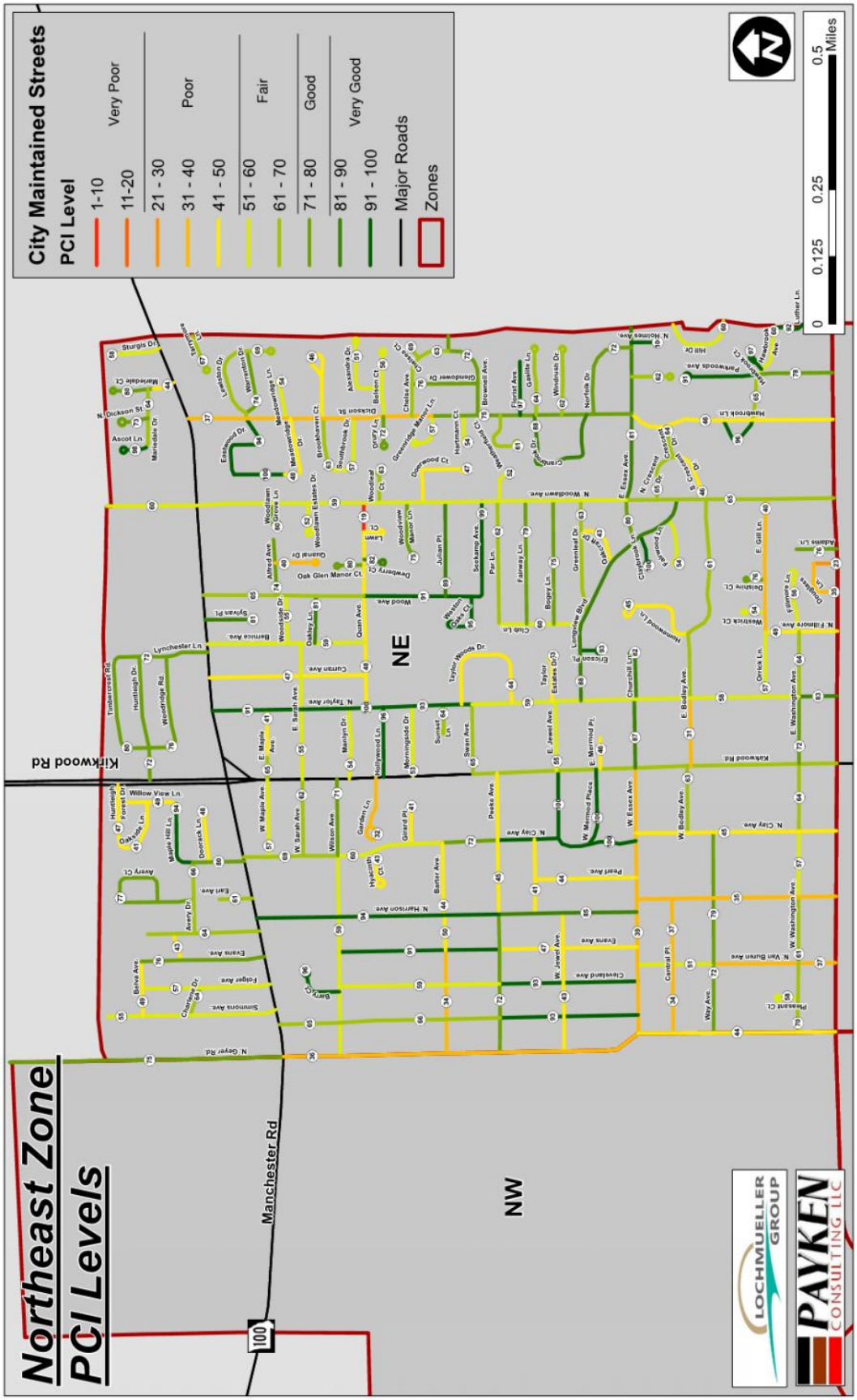
Windgrove Rd.	Briarcreek	cul de sac	27.	480.	KirkwoodMO::Windgrove::002	12,960.00	PCC	W	**30**	
Windy Hill Rd.	Emmerson	Enola	23.	810.	KirkwoodMO::WindyHill::001	18,630.00	AC	W	**63**	
Woodard Dr.	S. Geyer	cul de sac	25.	1,020.	KirkwoodMO::Woodard::001	25,500.00	AC	W	**61**	
Wooddell Ct	W. Woodbine	cul de sac	27.	544.	KirkwoodMO::Wooddell::001	13,056.00	PCC	W	**39**	
						25.34			**68.9**	**133**
						113.81	Total centerline miles			
						Average Concrete PCI =			***71.4***	
						Average Asphalt PCI =			***60.4***	
						Overall PCI =			***63.6***	

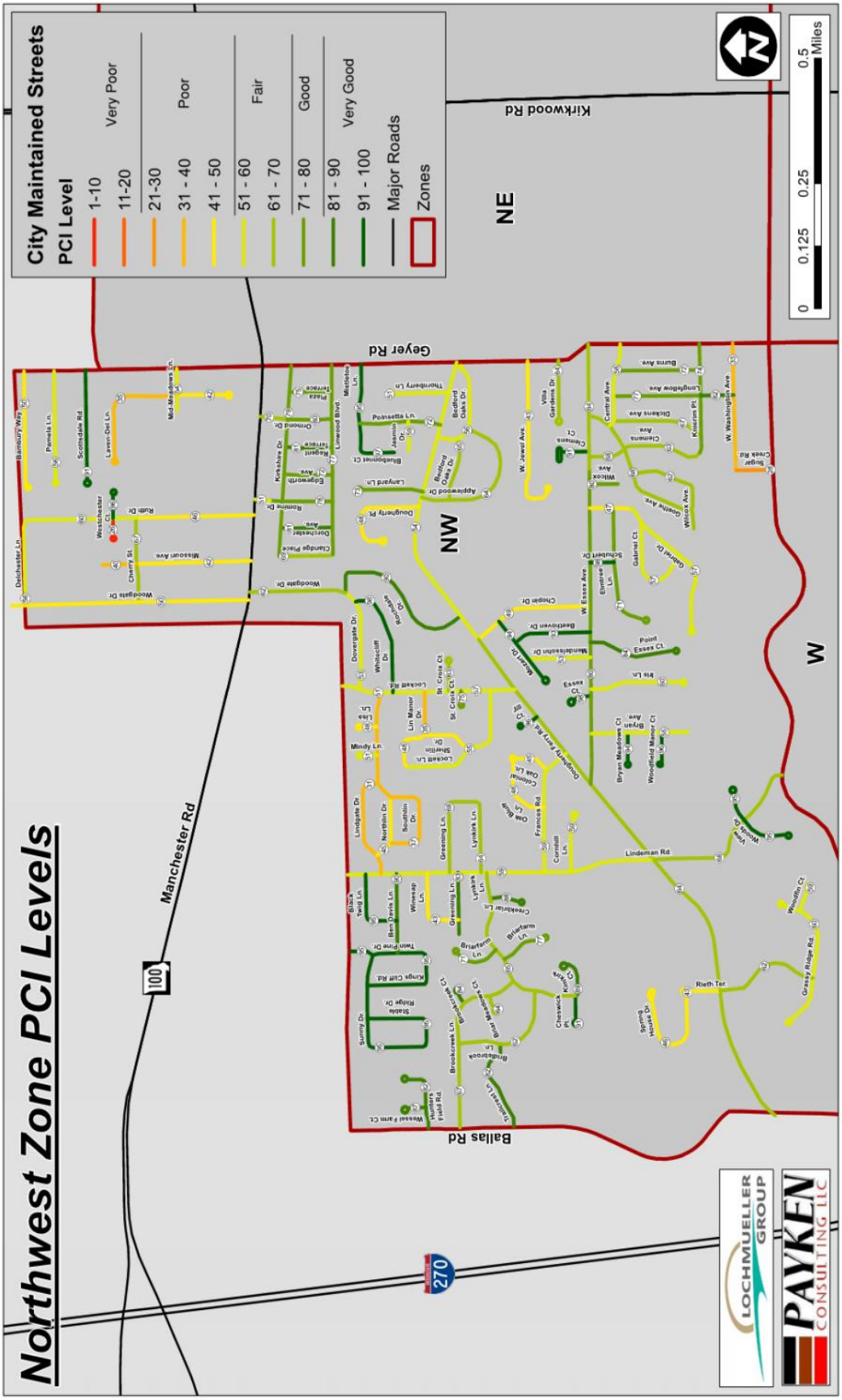
APPENDIX D

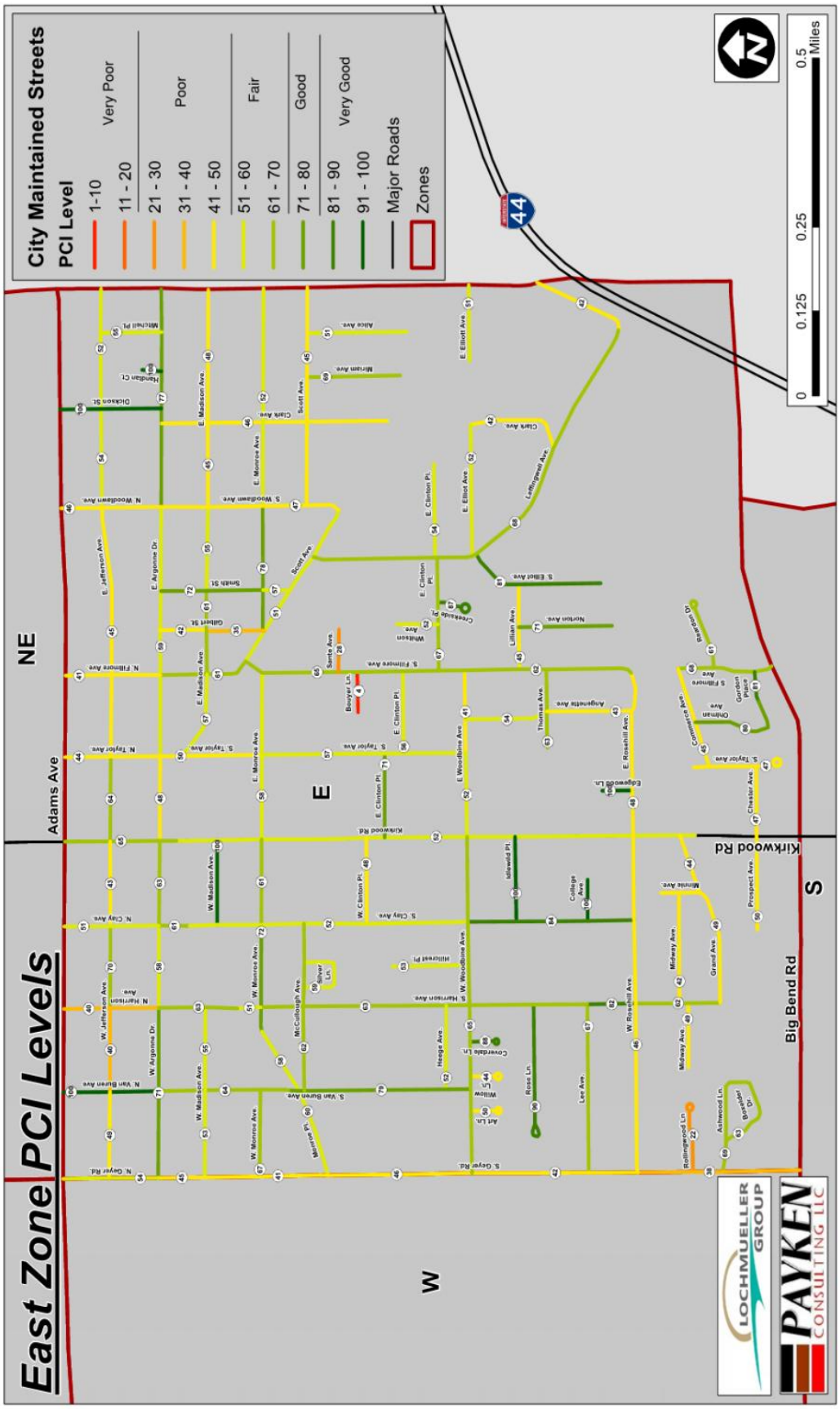
MICROPAVER Summary Maps

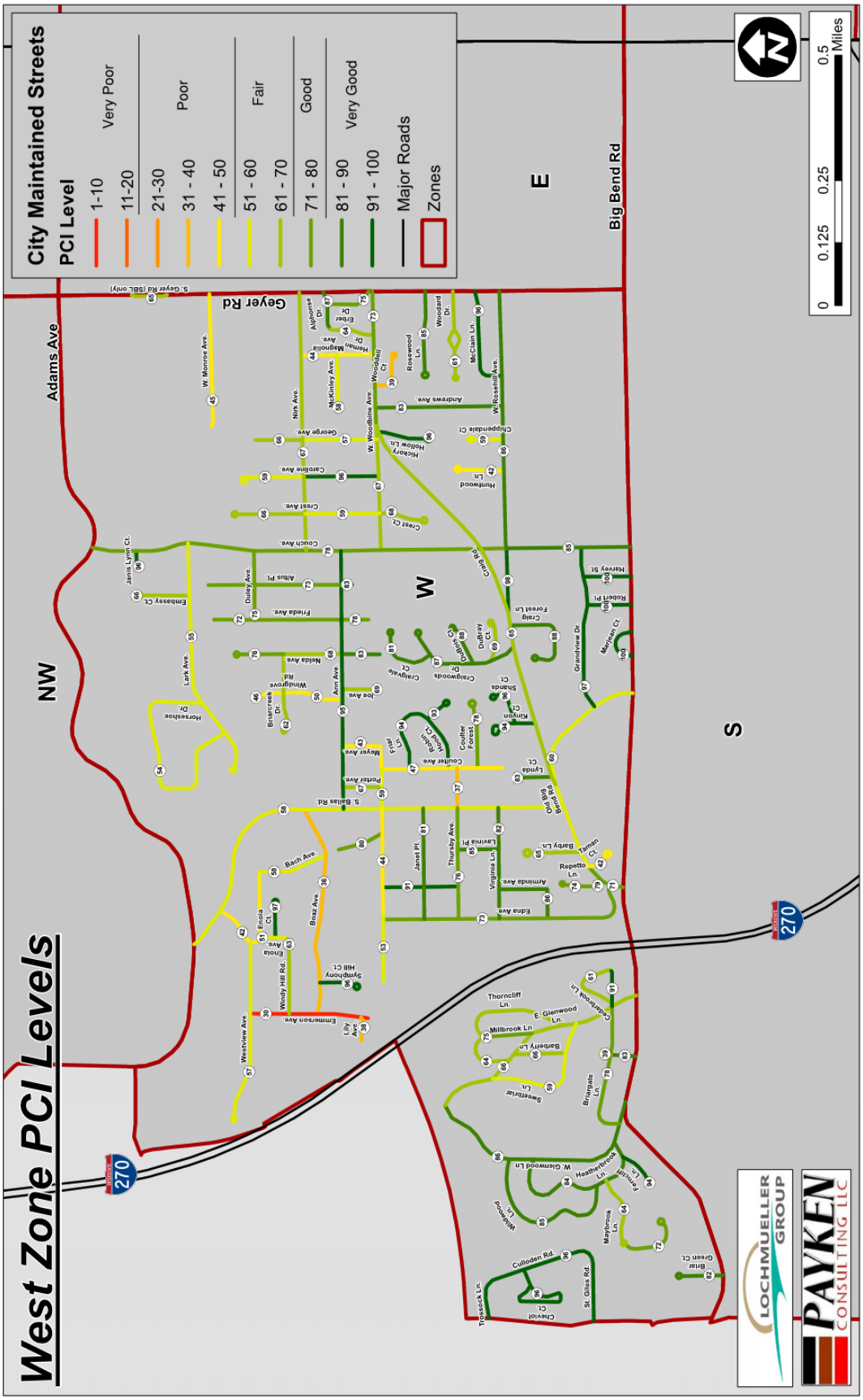
PCI Ratings (by maintenance zones)

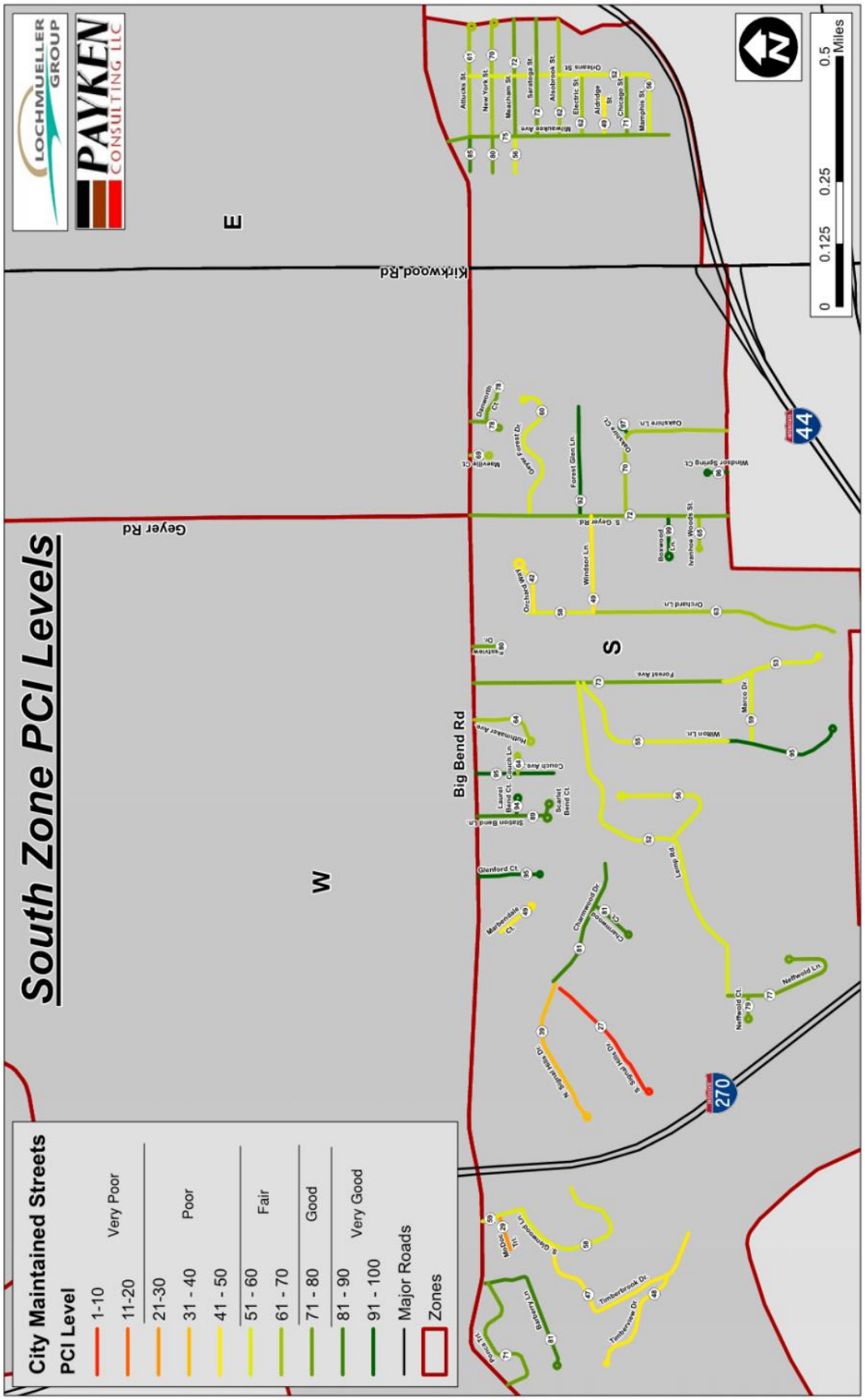

Kirkwood PCI Levels
City Maintained Streets
PCI Level
1-10
11 - 20
21 - 30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100
Very Poor
Poor
Fair
Good
Very Good
Major Roads
Zones
0 0.25 0.5 1 Miles
NE
NW
E
W
S
Woodlawn Ave
Adams Ave
Geyer Rd
Big Bend Rd
Kirkwood Rd
Watson Rd
Manchester Rd
Dougherty Ferry Rd
Lindemann Rd
Ballas Rd
100
270
44
366
LOCHMUELLER GROUP
PAYKEN CONSULTING LLC


Northeast Zone
PCI Levels
City Maintained Streets
PCI Level
1-10
11-20
Very Poor
21 - 30
31 - 40
41 - 50
Poor
51 - 60
61 - 70
Fair
71 - 80
81 - 90
Good
91 - 100
Very Good
Major Roads
Zones
0
0.125
0.25
0.5
Miles
NE
NW
Manchester Rd
Kirkwood Rd
100
LOCHMUELLER GROUP
PAYKEN CONSULTING LLC


Northwest Zone PCI Levels
City Maintained Streets
PCI Level
1-10
11-20
21-30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100
Very Poor
Poor
Fair
Good
Very Good
Major Roads
Zones
NE
NW
W
Kirkwood Rd
Geyer Rd
Ballas Rd
Manchester Rd
Lindeman Rd
0
0.125
0.25
0.5
Miles
LOCHMUELLER GROUP
PAYKEN CONSULTING LLC


East Zone PCI Levels
City Maintained Streets
PCI Level
1-10
11 - 20
Very Poor
21 - 30
31 - 40
Poor
41 - 50
51 - 60
Fair
61 - 70
71 - 80
Good
81 - 90
91 - 100
Very Good
Major Roads
Zones
0
0.125
0.25
0.5
Miles
NE
Adams Ave
E
W
S
Kirkwood Rd
Big Bend Rd
44
LOCHMUELLER GROUP
PAYKEN CONSULTING LLC


West Zone PCI Levels
City Maintained Streets
PCI Level
1-10
11-20
21-30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100
Very Poor
Poor
Fair
Good
Very Good
Major Roads
Zones
NW
W
E
S
Adams Ave
Geyer Rd
Big Bend Rd
270
0
0.125
0.25
0.5
Miles
LOCHMUELLER GROUP
PAYKEN CONSULTING LLC


South Zone PCI Levels
City Maintained Streets
PCI Level
1-10
11-20
Very Poor
21-30
31 - 40
Poor
41 - 50
51 - 60
Fair
61 - 70
71 - 80
Good
81 - 90
Very Good
91 - 100
Major Roads
Zones
Kirkwood Rd
Geyer Rd
Big Bend Rd
W
S
E
0
0.125
0.25
0.5
Miles

APPENDIX E

Photos of Street Structural Distresses

NORTH WOODLAWN AVENUE

PATCH IN GOOD CONDITION, LOW LONGITUDINAL AND TRANSVERSE CRACKING AS WELL AS HIGH ALLIGATOR CRACKING

NORTH WOODLAWN AVENUE

PATCHING IN FAIR TO GOOD CONDITION WITH LOW LONGITUDINAL AND TRANSVERSE CRACKING WHICH HAS BEEN CRACK SEALED

WEST ARGONNE AVENUE

SEALED AND UNSEALED LONGITUDINAL AND TRANSVERSE CRACKING

WEST ARGONNE AVENUE

ALLIGATOR CRACKING WITH LONGITUDINAL AND TRANSVERSE CRACKING AS WELL AS WEATHERING

BARTER AVENUE

WORN MICROSURFACE WITH LONGITUDINAL AND TRANSVERSE CRACKING

BARTER AVENUE

WORN MICROSURFACE SHOWING SIGNS OF DELAMINATION AND POT HOLE FORMATION

BARTER AVENUE

WORN MICROSURFACE WITH LONGITUDINAL AND TRANSVERSE CRACKING

BARTER AVENUE

SEVERELY DETERIORATED MICROSURFACE WITH HIGH LONGITUDINAL AND TRANSVERSE CRACKING

BOUYER LANE

SEVERE PAVEMENT DETERIORATION WITH LONGITUDINAL, TRANSVERSE AND ALLIGATOR CRACKING WITH RAVELING AND POTHOLES

BOUYER LANE

SEVERE PAVEMENT DETERIORATION WITH LONGITUDINAL, TRANSVERSE AND ALLIGATOR CRACKING WITH RAVELING AND POTHOLES

DOUGLASS LANE

MODERATE LONGITUDINAL, TRANSVERSE AND ALLIGATOR CRACKING

GEYER ROAD

DETERIORATED PATCHING WITH MODERATE LONGITUDINAL AND TRANSVERSE CRACKING AS WELL AS MODERATE WEATHERING

QUAN AVENUE

TWO APPLICATIONS OF MICROSURFACING IN VERY POOR CONDITION WITH SEVERE LONGITUDINAL, TRANSVERSE AND HIGH ALLIGATOR CRACKING AS WELL AS RAVELING AND POTHOLES

QUAN AVENUE

UTILITY PATCH IN FAIR CONDITION WITH SEVERE LONGITUDINAL, TRANSVERSE AND HIGH ALLIGATOR CRACKING

WEST WASHINGTON AVENUE

PATCHING IN GOOD CONDITION WITH LONGITUDINAL AND TRANSVERSE CRACKING AS WELL AS MODERATE WEATHERING

WEST WASHINGTON AVENUE

SEVERE LONGITUDINAL, TRANSVERSE AND ALLIGATOR CRACKING WITH MODERATE WEATHERING

VAN BUREN AVENUE

PATCHING IN POOR CONDITION WITH JOINT DETERIORATION AND CORNER SPALLS AS WELL AS TRANSVERSE CRACKING

BOX ELDER DRIVE

PATCHING IN POOR CONDITION WITH DIVIDED SLABS, TRANSVERSE CRACKING, JOINT DETERIORATION AND CORNER SPALLS

BOX ELDER DRIVE

PATCHING IN POOR CONDITION WITH DIVIDED SLABS, TRANSVERSE CRACKING, JOINT DETERIORATION AND CORNER SPALLS

SOUTH FILLMORE AVENUE

WIDESPREAD UNSEALED LONGITUDINAL AND TRANSVERSE CRACKING WITH JOINT AND CORNER SPALLS AS WELL AS CORNER BREAKS, AND DIVIDED SLABS

ROLLINGWOOD LANE

PATCHING IN POOR CONDITION WITH DETERIORATED JOINT SEAL, CORNER SPALLS TRANSVERSE CRACKING

ROLLINGWOOD LANE

UTILITY PATCHING IN POOR CONDITION WITH DIVIDED SLABS, TRANSVERSE CRACKING, JOINT SEAL DETERIORATION AND CORNER SPALLS

ROLLINGWOOD LANE

PATCHING IN POOR CONDITION WITH DIVIDED SLABS, TRANSVERSE CRACKING AS WELL AS SEVERE JOINT AND CORNER SPALLS

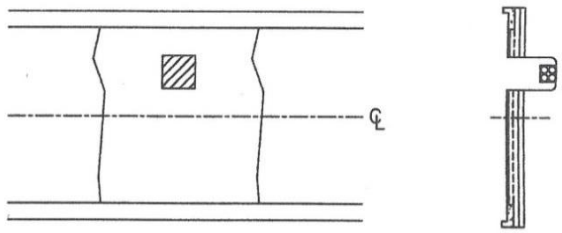
WESTCHESTER COURT

PATCHING IN POOR CONDITION WITH DETERIORATED JOINT SEAL, CORNER SPALLS AS WELL AS TRANSVERSE CRACKS, CORNER BREAKS, AND DIVIDED SLABS

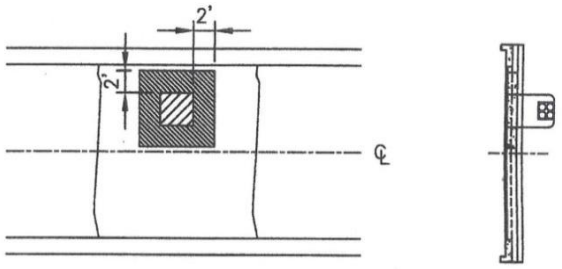
APPENDIX F

Recommended Pavement Restoration Standards

TYPICAL HOLE EXCAVATION



TYPICAL FULL PANEL RESTORATION



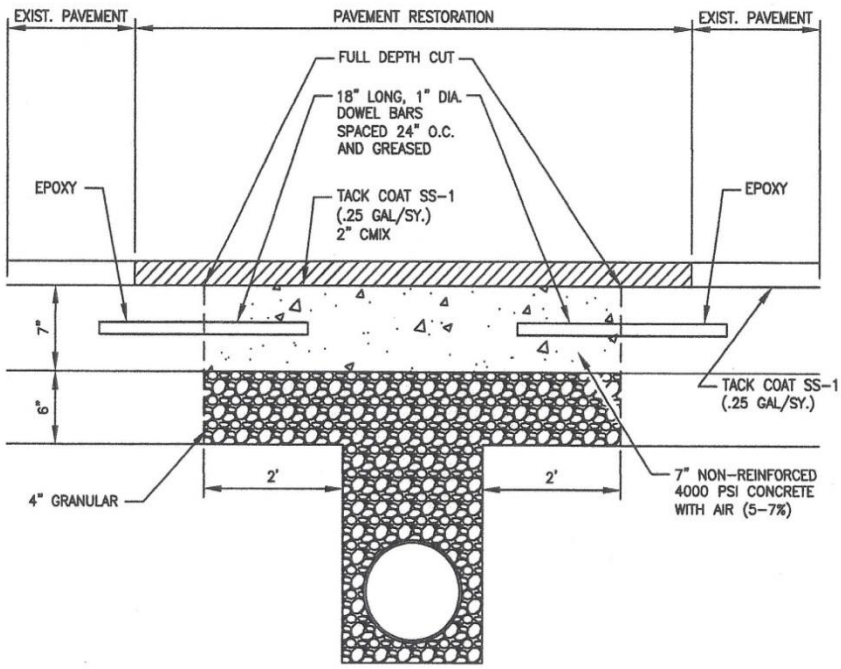
1. CONCRETE PAVEMENT: WHERE PARTIAL PANEL REPLACEMENT IS ALLOWED. ADDITIONAL PAVEMENT REPLACEMENT BEYOND THE CUT OR TRENCH LINE WILL BE REQUIRED UNDER THE FOLLOWING CONDITIONS:

   A. CUTS LESS THAN 18 SQUARE FEET AND WHERE THE DEPTH OF EXCAVATION IS 6 FEET OR LESS BELOW GRADE AND NOT WITHIN IT'S INITIAL SIZE.
   B. MINIMUM RESTORATION SLAB SHALL BE 3 FEET WIDE IN THE LONGITUDINAL DIRECTION AND 5 FEET LONG IN THE TRANSVERSE DIRECTION.
   C. IF CUT IS LESS THAN 3 FEET FROM THE LONGITUDINAL OR 5 FEET FROM THE TRANSVERSE JOINT OR OTHER PATCHES OR CRACKS, THE INTERVENING PORTION OF THE SLAB MUST BE REMOVED.

2. ASPHALT PAVEMENT:
   A. MINIMUM WIDTH OF REPLACEMENT OVERLAY SHALL BE THE FULL LANE WIDTH ON MULTIPLE LANE ROADWAYS AND TO THE CENTERLINE ON TWO LANE ROADS.
   B. THE LENGTH OF REPLACEMENT SHALL BE THE LONGITUDINAL LENGTH OF THE CUT PLUS 24 INCHES AT BOTH ENDS. IN ALL CASES THE TOP OF BASE PAVEMENT MUST BE EXPOSED A MINIMUM OF 24 INCHES FROM ALL EDGES OF THE CUT.

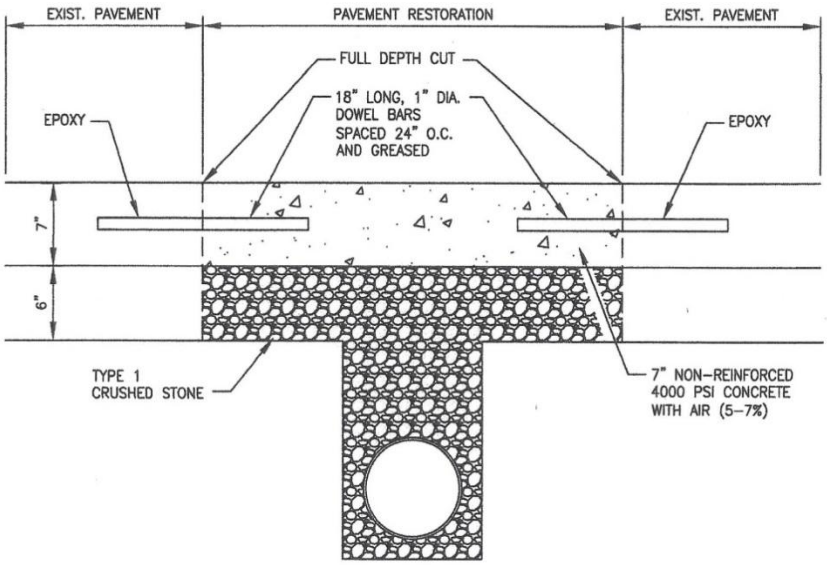
PAVEMENT RESTORATION DETAIL - ATTACHMENT H
PARTIAL PANEL REPLACEMENT

REV.	DATE	DESCRIPTION	APPROVED	SCALE NONE	DRAWN BY TJM
				DATE 2.22.06	CHECKED BY TJM



PAVEMENT RESTORATION DETAIL - ATTACHMENT B
CONCRETE PAVEMENT WITH ASPHALT OVERLAY

REV.	DATE	DESCRIPTION	APPROVED	SCALE NONE	DRAWN BY TJM
				DATE 2.22.06	CHECKED BY TJM



NOTES:

1. FULL PANEL REPLACEMENT IS REQUIRED UNLESS OTHERWISE SPECIFIED BY DEPARTMENT OF PUBLIC WORKS.

PAVEMENT RESTORATION DETAIL - ATTACHMENT A
PARTIAL PANEL REPLACEMENT

REV.	DATE	DESCRIPTION	APPROVED	SCALE NONE	DRAWN BY TJM
				DATE 2.22.06	CHECKED BY TJM

APPENDIX G

Summary of the Neighborhood Improvement District Act

Describing various options for the use of NID, CID and TDD Taxing Districts

(Prepared by Mr. James Mellon, with Armstrong Teasdale)

Armstrong Teasdale

SUMMARY OF THE

NEIGHBORHOOD IMPROVEMENT DISTRICT ACT

PREPARED BY:

JAMES E. MELLO
MARK A. BOATMAN
ROBERT D. KLAHR
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AUGUST 2010

EXECUTIVE SUMMARY

Missouri statutes provide a number of financing tools to spur economic development throughout the state. One such tool that has recently received increasing attention is the creation of a neighborhood improvement district, or "NID" as it is commonly called, which may be established pursuant to the Neighborhood Improvement District Act (the "NID Act").

Simply defined, a NID is a geographically bounded area within which certain public improvements are financed by a city through the issuance of notes or bonds, which are in turn repaid by levying assessments against the property within the NID. Under the NID Act, notes or bonds may be issued to pay for any one or more public facilities or improvements which confer a benefit on property within the NID, including streets, street lighting, parks and recreational facilities, sidewalks, utility service connections, sewer and storm water systems, flood control works, off-street parking structures, bridges, overpasses, tunnels, and any other public facilities or improvements deemed necessary by the governing body of the city. The NID Act also allows certain incidental costs to be financed, such as land acquisition and engineering, legal, and financing fees and costs.

A NID may be established in one of two ways: (1) by a petition of at least two-thirds of the owners of record of all of the real property located within the proposed NID requesting that the city approve the NID; or (2) by the city's submission of a question to all qualified voters residing within the proposed NID at a general or special election called for that purpose, which question must be approved by the requisite percentage of votes required for the city to issue any other general obligation debt.

Unlike other development vehicles, such as tax increment financing ("TIF"), a NID is financed by the issuance of general, rather than limited, obligation bonds. Since general obligation bonds are secured by the general revenue of the city rather than by a special, limited revenue source, such bonds are often perceived by the bond market as being more secure than limited obligations, and thus can frequently be sold at a lower interest rate. Further, a NID can be established anywhere; there is no requirement that a NID suffer from any conditions of blight.

To pay for the public improvements, the city levies assessments that are over and above any property or sales taxes already being imposed. While the property owners are primarily responsible for payment of the costs of the public improvements, the city carries its share of the burden as well. If the property owners fail to pay their assessments, the city that is ultimately responsible to the bondholders, although the delinquent assessments constitute liens on the property and, as such, the city has some recourse against the property owners. Unlike TIF, however, school districts and fire districts bear none of the burden, even though they may receive some benefit from any increase in tax revenues attributable to the public improvements.

The NID Act contains several unique features that enhance its utility. First, a NID can be established and an assessment imposed without a city-wide election. Also, since the city issues general obligation bonds, the public improvements can be financed at lower interest rates. Third, the city oversees the formation of each NID and approves the plans and specifications of each project and, as such, may group two or more NID projects together into one bond issue to further

reduce the costs. Fourth, the NID Act allows for a broad range of public improvements to be financed without a requirement that the area to be improved suffer from any conditions of blight.

I. INTRODUCTION

Missouri statutes provide a number of financing tools to spur economic development throughout the state. One such tool that has recently received increasing attention in public finance law practices is neighborhood improvement districts, or *"NIDS"* as they are commonly called.

Simply defined, a neighborhood improvement district is a geographically bounded area within which certain public improvements are financed by the local government through the issuance of notes or general obligation bonds, which are in turn retired by assessing the property owners in the district on some equitable basis. *See* § 67.453(6), RSMo. Used alone or in conjunction with tax increment financing, NIDs can provide the flexibility necessary to meet some of the difficult political, legal and financial challenges that accompany the transformation of property from under-utilized to economically prosperous.

Because of the flexibility of NIDs as a financing/development tool, their true potential and applicability can only be realized when the concept is applied to a particular set of circumstances. Accordingly, this Summary is intended only as a general introduction to NIDS.

II. GENERAL PROVISIONS OF THE NID ACT

Legal Authority. Under the authority of Article III, Section 38(c) of the Missouri Constitution, the General Assembly enacted the Neighborhood Improvement District Act (the *"NID Act"*), effective August 1991. *See* §§ 67.453-67.475, RSMo.

Purpose. Although not expressly stated, the general purpose of the NID Act can be inferred from the overall effect of the statute. The NID Act's purpose is to stimulate the development of public improvements by providing an equitable and politically expeditious method of financing those improvements. The Act achieves this purpose by offering a financing methodology unique among statutory development vehicles.

Unlike other development vehicles, such as tax increment financing (*"TIF"*), NIDs are financed by the issuance of general, rather than limited, obligation bonds. § 67.471, RSMo. Because general obligation bonds are secured by the general revenue of the issuing municipality rather than by monies of a limited fund, they are often perceived by the bond market as more secure than limited obligations, and thus can frequently be sold at a lower interest rate. Before NID, however, local governments could issue general obligation bonds for financing public improvements only upon the approval of a super majority of the general electorate. *See* Mo. CONST. Art. VI, § 26. In circumstances where the benefits of the improvements being financed accrued only to a limited number of voters, such propositions were likely to be rejected by the general electorate. The NID Act retains the same super majority requirement (two-thirds) for approving the establishment of the district (and thus any resulting debt issuance), but the NID Act limits the vote to the property owners within the neighborhood improvement district - the very people who will benefit from, and pay for, the improvements. *See* § 67.457.3, RSMo.

Establishing the District. A NID is established by a process, discussed in more detail below, requiring approval of two-thirds of the qualified voters within the proposed district. *See* § 67.457, RSMo. There are no particular limitations on district boundaries, except that the district fall within the municipal boundaries of the local government issuing the debt. Even single-owner and single-parcel districts are permissible. *See* § 67.457, RSMo; *see also Spradlin v. City of Fulton*, 924 S.W.2d 259, 263 (Mo. banc 1996) ('the constitution does not require either multiple parcels or multiple residents before a neighborhood improvement district can exist.").

Eligible Improvements and Costs. Under the NID Act, notes or bonds may be issued to pay for "any one or more public facilities or improvements which confer a benefit on property within" the district, including streets, lighting, parks and recreational facilities, sidewalks, utility service connections, sewer and storm water systems, flood control works, off-street parking structures, bridges, overpasses, tunnels, and "any other public facilities or improvements deemed necessary by the governing body of the city or county." § 67.453, RSMo. The NID Act also allows certain incidental costs to be financed, such as land acquisition and engineering, legal, and financing fees and costs. § 67.453(3), RSMo. Provisions for maintenance of the project during the term of the bonds or notes must also be enacted. § 67.456(2), RSMo.

Financing Methods. Once the NID is established, the local government may issue temporary notes to finance the proposed improvements, which may then be refunded by issuing general obligation bonds. *See* §§ 67.455, .471, RSMo. The principal and interest payments on the notes or bonds are passed on to property owners within the district through special assessments, which are made concurrently with property tax assessments. *See* § 67.463.4, RSMo. As previously mentioned, because the cost of financing is paid through special assessments, no vote by the general public is required for the issuance of the notes or bonds.

Special Assessment Methods. The NID Act requires that property owners within the district be assessed on some basis "which results in imposing substantially equal burdens or share of the cost upon property similarly benefited." § 67.459, RSMo. Typical means of apportioning the assessment are by lot, by square foot, or by front foot.

Security for the Issuer and Bond or Note Holders. The NID Act offers security for the issuing municipality by providing that the special assessment becomes a lien on the property to the same extent as a tax upon real property . § 67.469, RSMo. Such tax liens have priority over any mortgages, in the event of default. *See* § 67.469, RSMo. Holders of NID bonds or notes receive additional security, in that the bonds or notes are backed by the full faith and credit of the issuing municipality, subject to the limitations set out in the *Fulton* case, discussed below.

III. PROCEDURE FOR ESTABLISHING A NID

The NID Act sets out a detailed procedure for establishing a neighborhood improvement district. *See* §§ 67.457-67.463, RSMo 1994. This procedure, while not particularly burdensome, must be followed to the letter in order to insure the legal validity of the district and thereby the validity and marketability of the notes or bonds issued to pay for the improvements. The following is a step-by-step outline of the procedure in roughly chronological order:

Alternative Procedures for Initiating the Establishment of a NID. There are two alternative procedures for initiating the establishment of a neighborhood improvement district:

> **By submission to qualified voters within the proposed district.** The governing body of the city or county may by resolution submit the question of creating a district to all qualified voters residing within the proposed district at a general election or a special election called for that purpose. Section 67.457.2 of the NID Act details the specific procedures to be followed and the information to be contained in the ballot.
>
> **By petition of the property owners within the proposed district.** At least two-thirds of the owners of record of all of the real property located within the proposed district may petition the city or county to create the district. § 67.457.3, RSMo. The petition must be filed with the city or county clerk. Section 67.457.3 provides a detailed list of the information the petition must contain. Owners are limited to one signature on the petition to establish a neighborhood improvement district, regardless of how many parcels are owned in the proposed district. § 67.457, RSMo.

Municipal Approval. After receiving requisite voter approval or upon the filing of a proper petition, the governing body must consider the advisability of the improvements and may order by resolution or ordinance that the district be established and that preliminary plans and specifications for the improvements be made. Under Section 67.457.4, the resolution or ordinance must cover the same essential information as required in the petition.

Proposed Assessment Role. After enacting the ordinance or resolution establishing the NID and once the plans and specifications have been prepared, the governing body must by ordinance or resolution order that assessments be made against each property deemed to be benefited by the improvements based upon the revised estimated cost of the improvements or, if available, the final cost, and must order the preparation of a proposed assessment role. § 67.457.4, RSMo.

Public Inspection of Plans and Specifications and Proposed Assessment Role. The plans and specifications and the proposed assessment role must be filed with the city or county clerk and be open for public inspection. § 67.461.2, RSMo.

Public Hearing. A public hearing must be held, at which the governing body must hear and pass upon all objections, if any, to the proposed improvements and proposed assessments. § 67.463.1, RSMo. Notice of the hearing must be published and mailed to the affected property owners. § 67.461.2, RSMo. At the hearing, the governing body may amend the proposed improvements, the plans and specifications, or the proposed assessments. § 67.463.1, RSMo. Additional notice and public comment may be required when a county, city, town, or any entity created by these political subdivisions votes to implement a tax increase, to approve a redevelopment plan that pledges public funds, or with respect to a retail development project which utilizes the power of eminent domain. § 67.2725, RSMo.

Ordinance Authorizing Construction and Financing. If the governing body approves the project at the hearing, it then passes an ordinance authorizing the construction and financing of the improvements. § 67.463.1, RSMo.

Public Bid. For County-sponsored NIDS, the project must be bid publicly, and a contract is entered into with the bid winner. § 50.660, RSMo. The local ordinances of many municipalities also require public bidding.

Debt Obligations Issued. Temporary notes may be issued until construction is completed. § 67.471, RSMo. Upon completion, general obligation bonds are issued, for a term of up to twenty years. § 67.471, RSMo. The average maturity of bonds issued after August 28, 2004 cannot exceed 120% of the average economic life of the improvement for which the bonds are being issued. § 67.456(1), RSMo.

Establishment of Special Fund. The city or county must establish a separate fund in which the proceeds of the temporary notes or bonds are deposited and from which the project costs are paid. § 67.473, RSMo. Any balance after completion must be credited against the amount of the original assessment of each parcel on a pro-rata basis, and refunded. § 67.473, RSMo.

Assessing the Property Owners. Upon completion of the project, the governing body adopts an ordinance assessing each parcel with its proportionate share of the costs. § 67.463.2, RSMo. The city or county clerk then mails a notice to each property owner to inform them of the assessment, with a statement that they may pay the assessment in full or in the installments according to the bond financing. § 67.463.3-4, RSMo.

Assessments Paid. The first installment is due at the beginning of the first year after the completion of the project. § 67.463.4, RSMo.

IV. COMPARING NID AND TIF

Primary Distinctions and Similarities. Both NID and TIF are premised on the philosophy that an investment in public improvements spurs economic development, which in the long run will pay for the public improvements and more. These two economic development vehicles differ primarily in how the burden of financing the improvements is distributed among the property owners, the municipality and other taxing jurisdictions.

With NID, the property owners within the district pay for the public improvements through assessments over and above any property or sales taxes they already pay. *See* § 67.461, RSMo. The municipality carries its share of the burden as well; if the property owners fail to pay their assessments, it is the municipality who is ultimately responsible to the bondholders (although the fact that the assessments constitute liens on the property does provide the municipality with recourse). *See* § 67.469, RSMo. However, other taxing jurisdictions such as school and fire districts share none of the burden with a NID, but may benefit from any increase in tax revenues attributable to the improvements.

With TIF, the burdens are basically reversed. The property owner/developer pays nothing for the publicly financed improvements, but is ultimately responsible to the bondholders if the tax revenue

generated by the improvements is insufficient to make the payments. The municipality, on the other hand, has no financial responsibility to the bondholders, but along with the other affected taxing jurisdictions, "pays" for the improvements by foregoing a portion of the increased tax revenue until the bonds are paid off.

This difference in the distribution of burdens points to a more fundamental distinction between the two development vehicles, a distinction which can aid in determining which vehicle is more appropriate for a particular set of circumstances. Under TIF, the affected taxing jurisdictions can justify temporarily foregoing the increased tax revenue because the area being developed is declared by the municipality to be blighted, and a finding is made that but for financing the improvements, the development - and the resulting increase in tax revenues - would not occur. Thus, TIF is appropriate in circumstances where development is not likely to take place without the incentive that TIF offers, i.e., where it is not financially feasible for the property owner(s) to pay for the desired improvements.

In contrast, there is no requirement that a NID be declared blighted or that a finding be made that the improvements would not likely be constructed without the NID financing. NIDS, without any such limitation, have potentially broader application, at least where it is financially feasible for property owners to foot the bill. And NIDS, by lowering the cost of making improvements through public financing, will make more development projects financially feasible.

Using TIF and NIDs Together. The distinctions between TIF and NIDs do not preclude their use together on the same project. In fact, on the right project, the distinctions between TIF and NIDs actually complement each other. Because TIF bonds are a special obligation repayable solely from the potential cash flow from new taxes generated by development project that is not yet built, they represent a certain level of risk for investors, which can be reflected in the rate of interest on the bonds or in their stability in general. The use of a NID along with TIF can lower the perceived level of risk, and thus the cost of financing.

Under such a scenario, the initial financing of the project would take place through the NID, with notes or bonds issued by the local government. Because NID obligations are a type of general obligation of the local government (*see* the discussion of the *Fulton* case below), these obligations are more easily sold at a favorable interest rate. Once the NID financing is in place, the improvements are built and begin generating tax revenues. With documented cash flow, the timing is then right to issue TIF bonds, the proceeds of which are used to retire the NID notes or bonds. Thus, the primary benefits of both development vehicles are realized: the favorable rates of NID financing are obtained, but the improvements are ultimately paid for from the increase in tax revenues generated by the development without obligating the municipality's general revenue.

V. SPECIAL CONSIDERATIONS FOR LOCAL GOVERNMENTS

In addition to the general information provided above, local governments should consider the following when contemplating the use of a NID:

City or County Approval. The governing body of the city or county has discretion to approve or disapprove NID projects presented to it. In using that discretion, factors that should be considered include:

- The need for improvements;

- The likelihood of default by property owners;
- The benefit of the NID financing compared to other alternatives.

Interest Rates. Bonds issued in conjunction with a NID are tax-exempt under most circumstances, thus the purchaser of the bonds does not pay state or federal income taxes on the interest earned. As a result, the purchaser of such a bond is willing to accept a lower rate of return on a municipal bond compared to a non-exempt security because the after-tax earnings are comparable. The actual interest rate will vary depending on market conditions and other factors, such as whether the rate is fixed or floating, and whether the bonds are publicly or privately sold. Generally, the interest rate is about 0.5% higher with privately sold bonds, but the issuance costs may be lower. Generally, it may be better to publicly bid the sale of bonds if the project is $500,000 or more.

Cost of Bond Issuance. While the interest paid may be thought of as a "cost" of financing, there are transaction costs independent of interest costs, such as the fees of legal and financial professionals and the cost of printing the bonds. These transaction costs are commonly referred to as "costs of issuance." Costs of issuance for a particular project will depend on several factors, including:

- Size of the bond issue (the larger the project, the smaller the costs of issuance on a percentage basis);
- Public sale or private placement;
- Number of bond purchasers;
- Number of property owners who will be assessed.

Financing Limits. A city or county may issue NID notes or bonds in an amount not to exceed the estimated cost of the improvements and 10% of the assessed valuation of taxable tangible property within the city of county. § 67.475, RSMo. The 10% limitation does not impact limits imposed for other general obligation bonds.

Prevailing Wage Law. State law requires that prevailing wages be paid to an employee of a contractor which uses public funds as payment. Therefore, in most cases, NID projects would be subject to the Prevailing Wage Law.

Bidding Requirements. State law (§ 50.660, RSMo) requires counties to publicly bid any contract in excess of $1,500. By local ordinance, most municipalities require similar procurement procedures.

Multiple Projects. A city or county may group two or more NID projects into one bond issue which would likely result in lower costs. *See* § 67.455, RSMo.

VI. SPECIAL CONSIDERATIONS FOR PROPERTY OWNERS

NIDs Initiated by Property Owners. In addition to the statutory requirements discussed above, the following matters should by considered by property owners desiring to initiate the establishment of a NID:

- Although the governing body makes the ultimate decision, property owners who petition for the creation of a NID are initially responsible for deciding the proposed scope of the project, such as what improvements will be made, how the payments will be assessed (per lot, per square foot, per acre, etc.), and when the project will be started.

- Property owners should engage a professional engineer to draw up a preliminary plan with a cost estimate (an engineer is required under § 327.421, RSMo). The engineer's fees may be paid with bond proceeds, when available.

- While not statutorily required, as a practical matter property owners should .meet with the city or county to advise them of the project and obtain their support prior to soliciting signatures for the petition.

- The property owners should engage an attorney knowledgeable with the NID program who can draft and/or review key documents to insure statutory compliance.

- The petition may also provide for an annual assessment for the cost of maintaining the improvements in each year after the bonds issued for the original improvements are paid in full. *See* § 67.457.4, RSMo.

Tax Deductibility. The IRS has determined that special assessments cannot be deducted from a property owner's income taxes, as can real and personal property taxes.

VII. THE FUTURE OF NID

The use of any new development vehicle involves a certain amount of uncertainty until the courts have had the opportunity to sort out any ambiguities and inconsistencies in the authorizing statute. With respect to the NID Act, that opportunity has been recently seized by the Missouri Supreme Court, with an outcome favorable for the future of NIDS.

The Fulton Case. In *Spradlin v. City of Fulton,* 924 S.W.2d 259 (Mo. banc 1996), the Missouri Supreme Court considered an apparent inconsistency between the language contained in the NID Amendment to the Missouri Constitution and the Hancock Amendment. The NID Amendment (Mo. CONST. Art. III, § 38(c))

permits the issuance of general obligation bonds without expressly requiring a vote of the general electorate. Under this authority, the General Assembly enacted the NID Act, expressly authorizing the issuance of general obligation bonds without a vote of the general electorate. The Hancock Amendment (Mo. CONST. Art. X, § 16; *see also* Art. VI, § 26), however, requires a vote of the general electorate before any tax can be increased. This created the possibility that a local government unable to collect adequate assessments to make the bond payments might raise taxes to make payments on a bond issue the electorate did not authorize, an apparent violation of the Hancock Amendment.

With a 4-3 majority, the Missouri Supreme Court resolved this apparent conflict in favor of upholding the constitutionality of the NID Act. *Fulton*, 924 S.W.2d at 264. The court held that the NID bonds constitute the "full faith and credit" guarantee of the issuing municipality that such bonds will be repaid even if special assessments are not sufficient to fund repayment. *Id.* Unlike traditional concepts of "full faith and credit," however, a municipality cannot increase taxes to pay this debt without approval by the general electorate. *Id.* at 265. In order to meet the obligations created by this hybrid guarantee, a municipality can either request public approval of a new tax through a city-wide or county-wide election (and thus satisfy the Hancock Amendment), or rely on existing revenues and surpluses as a source of payment. *Id.*

The *Fulton* decision secures the credit worthiness of NID bonds and insures that NIDs will be a viable alternative to TIFs and other more traditional financing vehicles. One question remains which might further have an impact on the credit worthiness of NID bonds. The court did not decide whether a court enforcing the collection of sums due under a defaulted NID bond could order the imposition of a tax to satisfy the municipality's obligation to repay the bonds. Thus it remains an open question what priority NID obligations will be assigned, i.e., whether NID bonds will be considered by the courts to be backed by the taxing power of the issuing municipality, or merely have the same priority as other ordinary contractual obligations.

Increasing Use of NIDS. With the *Fulton* decision, NIDs are now on a level playing field with other judicially-approved development vehicles. Since *Fulton*, there has been a clear increase in the number of NIDs established or under consideration. As the public finance market gains familiarity and comfort with this new financing vehicle, that trend should continue into the foreseeable future.

APPENDIX H

Private Streets within Kirkwood not Assessed:

Green Glen	Green Point	Hillcrest Place
Hoffman Avenue	Krauswood	Lacquer Drive
Oak Timber	Barrington Square	Bent Oak
Bishops Gate	Brooksgate Manor	Candleberry
Carriage Circle	Chancellor Square	Charmers Court
Claybine Drive	Cloisters	Colony Woods
Cork Elm	Cragknob Court	Creekfield Walk
Dickson Court	Douglas Lane	Eastview Drive
Fieldmont Drive	Finlay Road	Larkspur Lane
Pinegate	Provincial	Rayner
Reedway	Rockbridge	School Lane
Sommet Place	Stonecrest	Stoneridge
Stoneridge Trails	Limestone Place	Maryhurst
Middleton	Monclay	North Taylor Glen
Sugar Creek Ridge	Thursby	Sugar Creek Trail
Taylor Young	Wealowood	Woodland Trail
Sunny Drive (off Ballas Road)		

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