

***2010 - 2014
Road Maintenance Recommendations***

*for the
City of Hanover, MN*

September 7, 2010

Prepared by

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September 7, 2010

Honorable Mayor and City Council
City of Hanover
11250 5th Street NE
P.O. Box 278
Hanover, MN 55341

Re: 2010-2014 Road Maintenance Recommendations
for the City of Hanover, MN
WSB Project No. 1272-50

Dear Mayor and Council Members:

Transmitted herewith is the final report for the 2010-2014 Road Maintenance Recommendations for the City of Hanover.

This report amends the 2004-2009 Road Maintenance Recommendation Report reflecting 2010 conditions, and updates the Capital Improvement Plan (CIP).

With the number of new streets being added to the system and increasing traffic volumes on the older streets estimates beyond a 5-year plan are difficult to prepare. The 2010 Road Maintenance Recommendation Report only includes maintenance and construction through the year 2014.

We would be happy to discuss this report with you at your convenience. Please do not hesitate to contact me at (320) 252-4900 if you have any questions regarding this report.

Sincerely,

WSB & Associates, Inc.

A handwritten signature in black ink that reads "Michael J. Nielson". The signature is written in a cursive, flowing style.

Michael J. Nielson, P.E.
City Engineer

Enclosure

Certification

I hereby certify that this plan, specification or report was prepared by me or under my direct supervision and that I am a duly licensed professional engineer under the laws of the State of Minnesota.



Michael J. Nielson, P.E.

Date: September 7, 2010

Reg. No. 23623

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1. Introduction

In June 2010, the Hanover City Council authorized the visual surface evaluation of all City streets that will help in developing recommendations for annual maintenance of a 5-year Capital Improvement Program (CIP). The City streets that were reviewed are shown on Figure 1.

2. Scope

This report will discuss the results of the visual surface evaluation performed on July 16, 2010 of the City streets and present a proposed program for the maintenance and improvement of the streets.

3. Visual Surface Evaluation

The selected streets were visually reviewed as a part of this report. This review consisted of noting the following items for each street:

- Transverse cracking
- Longitudinal cracking
- Alligator cracking
- Rutting
- Presence of defined ditches and adequacy of drainage for surface runoff.
- Crack sealing
- Seal coating

For the observation of the various types of cracking and for rutting, the severity of each type was noted as being non-existent, low, medium, and severe. Existing drainage patterns and systems were observed and noted to be adequate or deficient. Also, if crack sealing and/or recent seal coating was apparent, these items were noted.

Transverse cracking consists of cracks that form across the road from edge to edge. Longitudinal cracks run along the street parallel to the centerline. The presence of these cracks is common in pavement surfaces. Typically, routine maintenance of streets, consisting of crack sealing and seal coating, works well to minimize the effects of transverse and longitudinal cracking.

Alligator cracking consists of many cracks that form a type of checkerboard pattern on the pavement surface. Depending on the severity of the cracking, it is typically an indication of a lack of structural support in the pavement or subgrade. Corrective measures can range from the patching of isolated areas, to overlaying of the pavement surface, to reconstruction of the street section.

The formation of ruts in the wheel paths is generally an indication that the pavement surface lacks the subgrade support required for the traffic loadings that are placed on the pavement surface. Overlaying the pavement surface with additional bituminous material will increase the structural capacity of the pavement and is usually completed where severe rutting is present.

The presence and condition of ditches along the pavement surface was noted because drainage of surface and sub-surface water away from the pavement surface is imperative to the structural capacity of the roadway. When water is present in the subgrade, freeze/thaw cycles can heave the pavement, dramatically reducing its life expectancy.

It should be noted that approximately half of the street segments currently do not have curb and gutter, drain tile and storm sewer. The addition of curb and gutter, drain tile and storm sewer will dramatically increase the life and structural capacity of the streets when subsurface water is eliminated from the street.

4. Rehabilitation Techniques

There are five rehabilitation techniques that are considered in this report and are as follows: Gravel Rehabilitation; Crack Sealing and Seal Coating; Resurfacing; and Reconstruction.

Gravel Rehabilitation consists of scarifying the existing gravel surface, adding additional Class 5 aggregate and re-compacting. Depending on the traffic loads and complaint levels, this rehabilitation should be done once or twice a year. The City should consider Bituminous Surfacing of these roads for the prevention of air and water pollution or waiting until sewer and water services are extended to the residents.

Crack Sealing and Chip Sealing is typically completed as preventive maintenance before 5 years after the initial construction of a street then every 7 years up to 20 years of the pavement life. This rehabilitation technique is not a structural fix for a pavement, as it will not add any strength to a pavement.

Bituminous Overlaying increases the structural capacity of the pavement. Overlays are usually programmed to be completed at year 20 of the pavement life, but may be needed earlier in cases where the pavement strength is not adequate for the traffic load. After an overlay project, the Crack Sealing and Seal Coating schedule is started over.

Resurfacing, is a technique that is used when there are existing paved streets with concrete curb & gutter and the bituminous surfacing is aged or deteriorated to the point where an overlay will not perform as expected. With this technique involves removing the in place surfacing and aggregate base. Each individual road will be evaluated based on the soil borings and pavement section will be designed. The pavement design may include sub-cutting the street 1-foot to 2-feet and placing select granular borrow material to increase the subgrade strength before placing the class 5 aggregate base and bituminous surfacing. In addition, drain tile may be recommended based on the ground water elevations.

Reconstruction is reserved for the streets in such poor condition that an overlay is not adequate to repair the street. Typically, there is a serious subgrade or drainage problem that needs to be remedied before any surface repair will be effective.

Maintenance Considerations

Crack sealing is the single most important maintenance procedure to increasing the life of a bituminous pavement. Pavement cracks during the winter months from shrinkage. Once a pavement cracks, water is channeled down the cracks into the aggregate base. Once the aggregate base is saturated, traffic will begin to pump the class 5 aggregate base up through the crack leaving a void under the pavement. Eventually traffic will pound on this crack and the pavement will begin to deteriorate and fault leaving a much wider crack and failure. By sealing cracks on an annual basis and preventing water from entering the subgrade these types of pavement failures can be minimized.

In addition to a the annual seal coating program, the City should consider a crack sealing program for streets that are not being seal coated in that particular year. At present cracks are sealed when the street is seal coated. Cracks may appear in a street during the winter following seal coating and under the present maintenance program would not get sealed for up to seven years. During this period, severe damage can be done to the pavement.

Reconstruction Considerations

There are several factors considered in determining whether a road needs to be reconstructed or can be rehabilitated in another way. These factors include:

- *Traffic Forecasting - to determine if the present street with will carry the amount of traffic projected for the next 20-years.*
- *Pedestrian accommodations*
- *Drainage - does the street have proper drainage? Is there a flooding or erosion problem associated with runoff from the street?*
- *Urban vs. rural street - is curb and gutter necessary and/or desirable*
- *Utilities - if there is not sewer and water in the roadway, will it be needed in the next 20 to 40 years?*
- *Subgrade - does the present roadway have sufficient subgrade strength and ground water separation.*
- *Economic Factors - The benefit-cost ratio should always be considered and needs to include long-term maintenance costs when considering the cost of each rehabilitation technique.*

Reconstruction Recommendations

There are two (2) segments of roadway that are candidates for reconstruction during the 5-year period of this report. These segments include:

River Road from 8th Street N. to 15th Street N. - The bituminous surfacing on this segment of road is in poor condition and should last a few more years without any significant work required. The road is proposed for chip seal in 2010 to prevent further deterioration. However, it is recommend the roadway be considered for bituminous overlay between 2013-2015.

Pheasant Run Subdivision. - The roadways within the Pheasant Run Subdivision are presently paved to a width of 32-feet with little or no provisions for drainage. The pavement is rapidly deteriorating and is exhibiting signs of poor subgrade drainage issues. The pavement is currently deteriorated to a level where additional crack sealing and chip sealing would have no benefit.

As previously motioned, the existing pavement deterioration is indicative of poor subgrade soils and drainage, thus a bituminous overlay would only provide a short-term solution. As a result, the roads within the Pheasant Run Subdivision are being recommended for reconstruction in the year 2014-2015. In addition to the proposed pavement reconstruction, the homes within the subdivision are currently not served by city utilities, therefore reconstruction is recommended to include the addition of sanitary sewer, water main, ditch/swale grading, and culvert replacements. The estimated cost for the Pheasant Run Subdivision Street and Utility Reconstruction Project is \$2,073,640 and includes all required utility work.

107th Avenue N. from CR 123 to Cul-de-Sac. – This segment of roadway is deteriorating condition and approximately ½ of the segment has been returned to a gravel section. This area is currently under consideration for development and therefore no reconstruction has been planned for this roadway. It has been determined that if the area develops the developer will be responsible for upgrading the street as necessary.

<i>Table 1 - Recommended Reconstruction Projects</i>					
<i>Street</i>	<i>Curb & Gutter</i>	<i>From</i>	<i>To</i>	<i>Proposed Construction Year</i>	<i>Future Project Cost</i>
River Road	No	8 th Street North	15th Street NE	2013	\$138,899.75
Pheasant Run Subdivision*	No	*	*	2014 - 2015	\$2,073,640.00

**9th Street N from Meander Rd to Riverview Rd
 8th Street N from Meander Rd to Riverview Rd
 Meadowlark La from Meander Rd to Cul-de-sac
 Overlook Cir from Riverview Rd to Cul-de-sac
 Riverview Rd from Duinink Rd to 9th St N*

5. Recommended Street Maintenance

The recommended maintenance and rehabilitation for the streets that were reviewed are shown on Figure 1. These recommendations are based on the visual surface evaluation that was completed. The recommended maintenance or rehabilitation procedure is shown in Table 2 below.

<i>Table 2 - Recommended Maintenance</i>							
<i>Street</i>	<i>Curb & Gutter</i>	<i>From</i>	<i>To</i>	<i>Recommendation</i>	<i>Year Paved</i>	<i>Last Sealed</i>	<i>Year</i>
Jonquil Lane	No	109th Avenue North	Cul-de-sac	Gravel- Grade & Class 5	-	-	Annual
Katydid Lane NE	No	Cul-de-sac	Cul-de-sac	Gravel- Grade & Class 5	-	-	Annual
Jandel Avenue NE	No	4th Street NE	Division Street	Gravel- Grade & Class 5	-	-	Annual
Kayla Lane	Yes	1360' south of Beebe Lk Rd	3310' south of Beebe Lk Rd	Crack Seal & Chip Seal Coat	2007	-	2010
Kaitlin Avenue	Yes	Kayla Lane	772' south of Kayla Lane	Crack Seal & Chip Seal Coat	2007	-	2010
6th Street NE	Yes	Kayla Lane	Cul-de-sac	Crack Seal & Chip Seal Coat	2007	-	2010
Kalland Lane NE	Yes	Kayla Lane	Cul-de-sac	Crack Seal & Chip Seal Coat	2007	-	2010
109th Avenue North	No	Settler's Lane	Cul-de-sac	Crack Seal & Chip Seal Coat	2007	-	2010
Main Street	Yes	La Beauxe	400' east of La Beauxe	Crack Seal & Chip Seal Coat	1999	-	2010
Church Street	Yes	Church Parking Lot	La Beauxe	Crack Seal & Chip Seal Coat	2008	-	2010
Garnet Court	Yes	River Road	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2003	2010
8th Street N	No	River Road	Meander Road	Crack Seal & Chip Seal Coat	2007	-	2010

Crow River Drive	No	River Road	Cul-de-sac	Crack Seal & Chip Seal Coat	1999	-	2011
Church Street	No	River Road	Church Parking Lot	Crack Seal & Chip Seal Coat	2008	-	2011
Main Street	Yes	400' east of La Beauxe	Mill Pond	Crack Seal & Chip Seal Coat	1999	-	2011
River Road	Yes	Mill Pond Trail	Riverview Road	Crack Seal & Chip Seal Coat	1999	-	2011
Lamont Avenue	No	8th Street N	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2003	2011
10th Street N	No	Lamont Avenue	River Road	Crack Seal & Chip Seal Coat	-	2003	2011
8th Street N	No	Lamont Avenue	River Road	Crack Seal & Chip Seal Coat	-	2003	2011
5th Street NE	No	La Beauxe	River Road	Crack Seal & Chip Seal Coat	-	2003	2011
4th Street NE	No	La Beauxe	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2003	2011
Prairie Lane	No	109th Avenue North	Ann Circle	Crack Seal & Chip Seal Coat	-	2004	2011
Ann Circle	No	Prairie Lane	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2004	2011
River Road	Yes	Riverview Road	8th Street N	Crack Seal & Chip Seal Coat	2007	-	2012
Irvine Drive	Yes	15th Street NE	15th Street NE	Crack Seal & Chip Seal Coat	2002	2004	2012
Easterly Oaks	Yes	Irvine Drive	12th Street	Crack Seal & Chip Seal Coat	2002	2004	2012
12th Street	Yes	River Road	Irvine Drive	Crack Seal & Chip Seal Coat	2002	2004	2012
12th Street	Yes	Irvine Drive	Rolling Oaks Drive	Crack Seal & Chip Seal Coat	2002	2004	2012

Rolling Oaks Drive	Yes	14th Street	Cul-de-sac	Crack Seal & Chip Seal Coat	2002	2004	2012
14th Street	Yes	Rolling Oaks Drive	Irvine Drive	Crack Seal & Chip Seal Coat	2002	2004	2012
Lambert Court	Yes	Oakwood Avenue	Cul-de-sac	Crack Seal & Chip Seal Coat	2002	2004	2012
Oakwood Avenue	Yes	14th Street	Irvine Drive	Crack Seal & Chip Seal Coat	2010	-	2012
Kaitlin Avenue	Yes	Kayla Lane	710' south of Kayla Lane	Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Kayla Lane	Yes	3310' south of Beebe Lake Road	Kadler Circle	Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Kadler Circle	Yes			Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Kalder Avenue NE	Yes	4 th Street NE	Kadler Circle	Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Kalder Avenue NE	Yes	Kadler Circle	Beebe Lake Road	Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Kalea Court	Yes	Kadler Circle	Cul-de-sac	Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Kalea Court	Yes		Cul-de-sac	Crack Seal & Chip Seal Coat	2005/ 2010	-	2012
Jasmine Avenue NE	Yes	Kalder Avenue NE	Jasmine Court NE	Crack Seal & Chip Seal Coat	2005B/ 2010W	-	2012
Jasmine Court NE	Yes		Cul-de-sac	Crack Seal & Chip Seal Coat	2005B/ 2010W	-	2012
10th Street N	Yes	River Road	Mallard Street NE	Crack Seal & Chip Seal Coat	2002	2004	2013
Mallard Street NE	Yes	8th Street N	220' north of Meadowbrook Ave	Crack Seal & Chip Seal Coat	2002	2004	2013
Meadowbrook Avenue NE	Yes	Mallard Street NE	10th Street N	Crack Seal & Chip Seal Coat	2002	2004	2013

Lynwood Avenue NE	Yes	10th Street N	Meadowbrook Avenue NE	Crack Seal & Chip Seal Coat	2002	2004	2013
Lynwood Court	Yes	Lynwood Avenue NE	Cul-de-sac	Crack Seal & Chip Seal Coat	2002	2004	2013
109th Avenue North	Yes	Rosedale Avenue	Settler's Lane	Crack Seal & Chip Seal Coat	2003	2006	2013
Settler's Lane	No	109th Avenue North	Rosedale Avenue	Crack Seal & Chip Seal Coat	2003	2006	2013
Cottage Lane	Yes	Settler's Lane	108th Avenue North	Crack Seal & Chip Seal Coat	2003	2006	2013
108th Avenue North	Yes	Cul-de-sac	107th Avenue North	Crack Seal & Chip Seal Coat	2003	2006	2013
107th Avenue North	Yes	108th Avenue North	106th Avenue North	Crack Seal & Chip Seal Coat	2003	2006	2013
106th Avenue North	Yes	107th Avenue North	Settler's Lane	Crack Seal & Chip Seal Coat	2003	2006	2013
Mallard Street NE	Yes	220' north of Meadowbrook Avenue	Cul-de-sac	Crack Seal & Chip Seal Coat	2005/ 2010	-	2013
Erin Street North	Yes	Mallard Street	11 th Street North	Crack Seal & Chip Seal Coat	2005/ 2010	-	2013
11 th Street North	Yes	River Road	Mallard Street	Crack Seal & Chip Seal Coat	2005/ 2010	-	2013
Emerald Street	Yes	11 th Street North	Mallard Street	Crack Seal & Chip Seal Coat	2005/ 2010	-	2013
10th Street NE	No	La Beauxe	Ladyslipper Lane NE	Crack Seal & Chip Seal Coat	-	2006	2014
Ladyslipper Lane NE	No	Cul-de-sac	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2006	2014
9th Street NE	No	La Beauxe	Katydid Lane NE	Crack Seal & Chip Seal Coat	-	2006	2014
107th Avenue North	Yes	Rosedale Avenue	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2006	2014

Kayla Lane	Yes	Beebe Lake Road	Cul-de-sac	Crack Seal & Chip Seal Coat	2002	2005	2014
Kalen Drive	Yes	Kayla Lane	Cul-de-sac	Crack Seal & Chip Seal Coat	2002	2005	2014
Kalen Lane	Yes	Kayla Lane	Cul-de-sac	Crack Seal & Chip Seal Coat	2002	2005	2014
Jandel Avenue	No	4th Street NE	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2005	2014
Jandel Court	No	Jandel Avenue NE	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2005	2014
Ginseng Lane	No	109th Avenue North	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2006	2014
Whitetail Drive	No	Crow-Hassan Park Road	County Road 117	Crack Seal & Chip Seal Coat	-	2006	2014
Whitetail Lane	No	Whitetail Drive	Cul-de-sac	Crack Seal & Chip Seal Coat	-	2006	2014

There are approximately twenty (20) miles of bituminous streets within the City of Hanover and will all need seal coating within the next seven (7) years.

There are approximately one (1) mile of gravel roadway remaining in the City of Hanover. No new construction of gravel roadways is anticipated in the future. These roadways can be improved when residents petition for street improvements or at the Councils initiation. It should be noted that with any street reconstruction, the City should require the abutting parcels to have sewer, water and storm sewer prior to the bituminous street improvements. The cost of these improvements would be assessed to the benefiting property owners.

Future Considerations Beyond 2014

Overlays

Overlays should be considered for other streets that at this time appear to be in relatively good condition as soon as a significant amount of alligator cracking begins to appear.

6. Financing

According to the City's Assessment Policy, street reconstruction, resurfacing (overlay), and upgrades from gravel to bituminous sections are all 100% assessable. The benefiting

properties bear the responsibility of the project costs for these improvements. Seal coating and Crack Sealing is entirely the responsibility of the City.

Potential Assessment Policy Changes

The Council may need to consider revisions to the current assessment policy based on the fact that Chapter 429 of the State Statutes requires that the amount of the assessment may not exceed the increase value of the property being assessed. Reconstruction and overlay project costs may exceed the value increase to the benefiting parcels.

Budget Considerations

The balance in the Street Capital Outlay Fund is \$190,000. The opinion of probable cost for the 2010 seal coating projects is approximately \$44,000 (includes street sweeping), which will leave a balance of \$146,000 in the Streets Capital Outlay Fund. This balance should remain for future projects.

Because of the cyclical nature of the seal coating projects, the council will have to decide how to budget for the street sweeping, gravel street restoration, crack sealing, and chip seal coating. Two methods can be done, either budget on an annual basis for the entire amount or try to balance the costs over a 5-year period at an estimated \$85,000.00 per year. The gravel restoration budget is at \$4,000.00 per year, the crack-sealing budget is \$5,000.00 per year. All of these budgets should be increased 3% to cover inflationary rates. In addition to the existing miles of roadway that will need to be seal coated, newly constructed streets will need to be added into the budget.

Table 3 (See Appendix B) outlines the seal coat projects, reconstruction projects, annual expenditures, and fund balances.

Appendix A

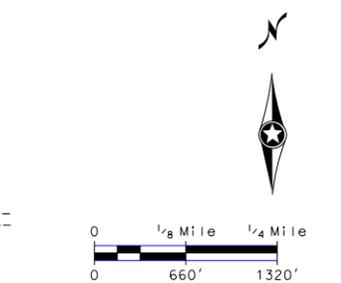
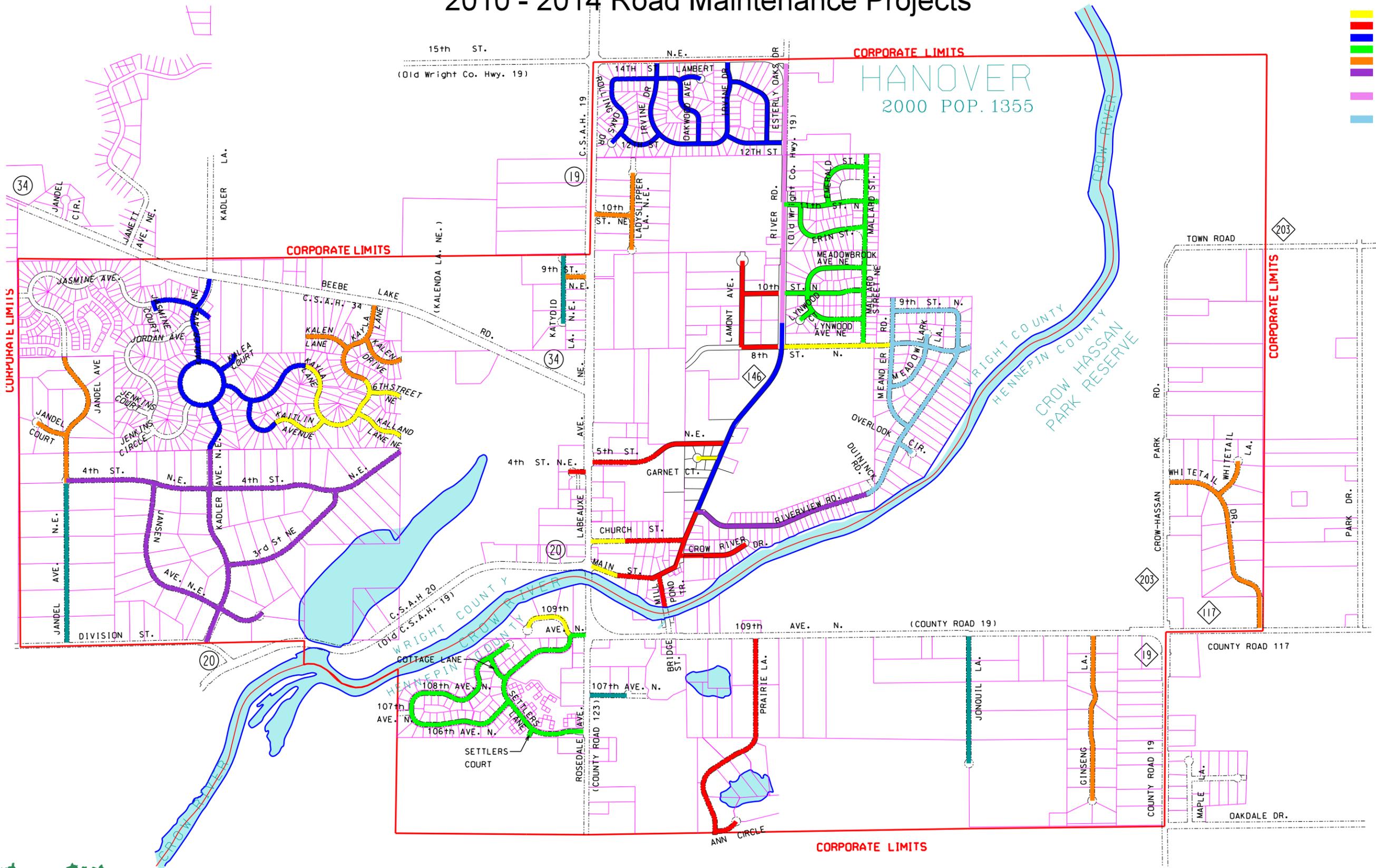
Figures

City of Hanover

2010 - 2014 Road Maintenance Projects

LEGEND

- Annual Gravel Road Maintenance
- 2010 Chip Seal
- 2011 Chip Seal
- 2012 Chip Seal
- 2013 Chip Seal
- 2014 Chip Seal
- 2015 Chip Seal
- 2013 Overlay
- 2014 - 2015 Reconstruction



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Appendix B
Cost Estimate

Table 1

Proposed Annual Gravel Maintenance

Year	Street	From	To	Length/Radius	Width	Area (SF)	Area (SY)
Annual	Jonquil Lane	109 th Avenue North	Cul-de-sac	1,691	32	54,112	6,012
Annual	Jonquil Lane		Cul-de-sac	45		6,359	707
Annual	Katydid Lane NE	Cul-de-sac	Cul-de-sac	752	32	24,064	2,674
Annual	Katydid Lane NE		Cul-de-sac	45		6,359	707
Annual	Katydid Lane NE		Cul-de-sac	45		6,359	707
Annual	Jandel Avenue NE	4 th Street NE	Division Street	2,160	32	69,120	7,680
				0.90	Total	166,372	18,486

Proposed Chip Seal Coat Projects

Year	Street	From	To	Length/Radius	Width	Area (SF)	Area (SY)	CRS-2 Emulsion (Gal)	FA-2 Granite Aggregate (ton)
2010	Kayla Lane	1360' south of Beebe Lk Rd	3310' south of Beebe Lk Rd	1,950	34	66,300	7,367	1,842	74
2010	Kaitlin Avenue	Kayla Lane	772' east of Kayla Lane	772	30	23,160	2,573	643	26
2010	6th Street NE	Kayla Lane	Cul-de-sac	443	30	13,290	1,477	369	15
2010	6th Street NE		Cul-de-sac	50		7,850	872	218	9
2010	Kalland Lane NE	Kayla Lane	Cul-de-sac	989	30	29,670	3,297	824	33
2010	Kalland Lane NE		Cul-de-sac	50		7,850	872	218	9
2010	109 th Avenue North	Settler's Lane	Cul-de-sac	800	40	32,000	3,556	889	36
2010	109 th Avenue North		Cul-de-sac	50		7,850	872	218	9
2010	Main Street	La Beauxe	400' east of La Beauxe	400	32	12,800	1,422	356	14
2010	Church Street	Church Parking Lot	La Beauxe	470	30	14,100	1,567	392	16
2010	Garnet Court	River Road	Cul-de-sac	230	28	6,440	716	179	7
2010	Garnet Court		Cul-de-sac	45		6,359	707	177	7
2010	8 th Street N	River Road	Meander Road	1,470	40	58,800	6,533	1,633	65
2010	River Road	8th Street N	15th Street NE	3,940	24	94,560	10,507	2,627	105
				2.21	Total	381,029	42,337	10,584	423
2011	Crow River Drive	River Road	Cul-de-sac	920	24	22,080	2,453	613	25
2011	Church Street	River Road	Church Parking Lot	760	28	21,280	2,364	591	24
2011	Main Street	400' east of La Beauxe	Mill Pond	560	40	22,400	2,489	622	25
2011	River Road	Mill Pond Trail	Riverview Road	1,090	40	43,600	4,844	1,211	48
2011	Lamont Avenue	8 th Street N	Cul-de-sac	1,100	40	44,000	4,889	1,222	49
2011	Lamont Avenue		Cul-de-sac	25		1,963	218	55	2
2011	10 th Street N	Lamont Avenue	River Road	500	40	20,000	2,222	556	22
2011	8 th Street N	Lamont Avenue	River Road	469	40	18,760	2,084	521	21
2011	5 th Street NE	La Beauxe	River Road	1,880	40	75,200	8,356	2,089	84
2011	4 th Street NE	La Beauxe	Cul-de-sac	150	40	6,000	667	167	7
2011	4 th Street NE		Cul-de-sac	40		5,024	558	140	6
2011	Prairie Lane	109 th Avenue North	Ann Circle	3,019	36	108,684	12,076	3,019	121
2011	Ann Circle	Prairie Lane	Cul-de-sac	241	36	8,676	964	241	10
2011	Ann Circle		Cul-de-sac	40		5,024	558	140	6
				2.04	Total	402,691	44,743	11,186	447
2012	River Road	Riverview Road	8th Street N	2,525	40	101,000	11,222	2,806	112
2012	Irvine Drive	15 th Street NE	15 th Street NE	2,946	34	100,164	11,129	2,782	111
2012	Easterly Oaks	Irvine Drive	12 th Street	1,150	34	39,100	4,344	1,086	43
2012	12 th Street	River Road	Irvine Drive	760	34	25,840	2,871	718	29
2012	12 th Street	Irvine Drive	Rolling Oaks Drive	578	34	19,652	2,184	546	22
2012	Rolling Oaks Drive	14 th Street	Cul-de-sac	894	34	30,396	3,377	844	34
2012	Rolling Oaks Drive		Cul-de-sac	45		6,359	707	177	7
2012	14 th Street	Rolling Oaks Drive	Irvine Drive	667	34	22,678	2,520	630	25
2012	Lambert Court	Oakwood Avenue	Cul-de-sac	30	30	900	100	25	1
2012	Oakwood Avenue	14th Street	Irvine Drive	1,170	34	39,780	4,420	1,105	44
2012	Kaitlin Avenue	Kayla Lane	710' south of Kayla Lane	710	30	21,300	2,367	592	24
2012	Kayla Lane	3310' south of Beebe Lk Rd	Kadler Circle	1,400	34	47,600	5,289	1,322	53
2012	Kadler Circle			1,890	34	64,260	7,140	1,785	71
2012	Kalder Avenue NE	4th Street NE	Kadler Circle	1,180	34	40,120	4,458	1,114	45
2012	Kalder Avenue NE	Kadler Circle	Beebe Lake Road	1,200	34	40,800	4,533	1,133	45
2012	Kalea Court	Kadler Circle	Cul-de-sac	150	30	4,500	500	125	5
2012	Kalea Court		Cul-de-sac	50		7,850	872	218	9
2012	Jasmine Avenue NE	Kalder Avenue NE	Jasmine Court NE	670	30	20,100	2,233	558	22
2012	Jasmine Court NE		Cul-de-sac	50		7,850	872	218	9
				3.42	Total	640,249	71,139	17,785	711
2013	10 th Street N	River Road	Mallard Street NE	1,100	30	33,000	3,667	917	37
2013	Mallard Street NE	8th Street N	220' north of Meadowbrook Ave	1,300	30	39,000	4,333	1,083	43
2013	Meadowbrook Avenue NE	Mallard Street NE	10 th Street N	1,075	30	32,250	3,583	896	36
2013	Lynwood Avenue NE	10 th Street N	Meadowbrook Avenue NE	1,200	30	36,000	4,000	1,000	40
2013	Lynwood Court	Lynwood Avenue NE	Cul-de-sac	160	30	4,800	533	133	5
2013	Lynwood Court		Cul-de-sac	45		6,359	707	177	7
2013	109 th Avenue North	Rosedale Avenue	Settler's Lane	280	34	9,520	1,058	264	11
2013	Settler's Lane	109 th Avenue North	Rosedale Avenue	2,765	34	94,010	10,446	2,611	104
2013	Cottage Lane	Settler's Lane	108 th Avenue North	375	34	12,750	1,417	354	14
2013	108 th Avenue North	Cul-de-sac	107 th Avenue North	1,700	34	57,800	6,422	1,606	64
2013	108 th Avenue North		Cul-de-sac	50		7,850	872	218	9
2013	107 th Avenue North	108 th Avenue North	106th Avenue North	220	34	7,480	831	208	8
2013	106 th Avenue North	107 th Avenue North	Settler's Lane	1,500	34	51,000	5,667	1,417	57
2013	Mallard Street NE	220' north of Meadowbrook Ave	Cul-de-sac	1,300	30	39,000	4,333	1,083	43
2013	Erin Street N	Mallard Street	11th Street N	1,190	30	35,700	3,967	992	40
2013	11th Street N	River Road	Mallard Street	1,280	30	38,400	4,267	1,067	43
2013	Emerald Street	11th Street N	Mallard Street	910	30	27,300	3,033	758	30
				3.12	Total	532,219	59,135	14,784	591

Table 1

2014	10 th Street NE	La Beauxe	Ladyslipper Lane NE	386	30	11,580	1,287	322	13
2014	Ladyslipper Lane NE	Cul-de-sac	Cul-de-sac	951	30	28,530	3,170	793	32
2014	Ladyslipper Lane NE		Cul-de-sac	45		6,359	707	177	7
2014	Ladyslipper Lane NE		Cul-de-sac	45		6,359	707	177	7
2014	9th Street NE	La Beauxe	Katydid Lane NE	280	32	8,960	996	249	10
2014	107 th Avenue North	Rosedale Avenue	Cul-de-sac	485	32	15,520	1,724	431	17
2014	107 th Avenue North		Cul-de-sac	50		7,850	872	218	9
2014	Kayla Lane	Beebe Lake Road	1360' south of Beebe Lk Rd	1,360	34	46,240	5,138	1,284	51
2014	Kalen Lane	Kayla Lane	Cul-de-sac	624	30	18,720	2,080	520	21
2014	Kalen Drive	Kayla Lane	Cul-de-sac	600	30	18,000	2,000	500	20
2014	Jandel Avenue	4 th Street NE	Cul-de-sac	1,724	32	55,168	6,130	1,532	61
2014	Jandel Court	Jandel Avenue NE	Cul-de-sac	331	32	10,592	1,177	294	12
2014	Jandel Court		Cul-de-sac	40		5,024	558	140	6
2014	Ginseng Lane	109th Avenue North	Cul-de-sac	2,222	22	48,877	5,431	1,358	54
2014	Whitetail Drive	Crow-Hassan Park Road	County Road 117	2,620	22	57,620	6,402	1,601	64
2014	Whitetail Lane	Whitetail Drive	Cul-de-sac	45		6,359	707	177	7
				2.24	Total	351,757	39,084	9,771	391

Future Chip Seal Coat Projects

Year	Street	From	To	Length/Radius	Width	Area (SF)	Area (SY)	CRS-2 Emulsion (Gal)	FA-2 Granite Aggregate (ton)
2015	Kadler Avenue NE	Division Street	4 th Street NE	1,967	28	55,076	6,120	1,530	61
2015	3 rd Street NE	Kadler Avenue NE	4 th Street NE	1,820	28	50,960	5,662	1,416	57
2015	4 th Street NE	Cul-de-sac	Jandel Avenue NE	4,470	28	125,160	13,907	3,477	139
2015	4 th Street NE		Cul-de-sac	40	0	5,024	558	140	6
2015	Jansen Avenue NE	4 th Street NE	Cul-de-sac	2,670	28	74,760	8,307	2,077	83
2015	Jansen Avenue NE		Cul-de-sac	40		5,024	558	140	6
2015	Riverview Road	River Road	Duininck Road	2,565	24	61,560	6,840	1,710	68
2015	Mill Pond Trail	Main Street	Cul-de-sac	360	26	9,360	1,040	260	10
				2.64	Total	386,924	42,992	10,748	430

				9.38	Total	3,436,428	381,825	95,456	3,818
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*Application Rate = 0.25 gal/SY

*Application Rate = 20 lbs/SY

Proposed Mill and Overlay Projects

Year	Street	From	To	Length/Radius	Width	Area (SF)	Area (SY)	Mill Bituminous Surface 1.75" (SY)	Type SP 12.5 Wear Course Mix (2,C) (Ton)
2013	River Road	8th Street North	15th Street NE	3,940	24	94,560	10,507	10,507	1,306
				0.75	Total	94,560	10,507	10,507	1,306

Proposed Street Reconstruction Projects

Year	Street	From	To	Length/Radius	Width	Area (SY)	Aggregate Base, CI V (Ton)	Type SP 12.5 Non-Wear Mix (2,C) (Ton)	Type SP 12.5 Wear Course Mix (2,C) (Ton)
2014-2015	9 th Street N	Riverview Road	Meander Road	885	32	3,147	1,140	391	391
2014-2015	8th Street N	Meander	Riverview Road	1,130	32	4,018	1,455	499	499
2014-2015	Meander Road	9 th Street N	Riverview Road	1,850	32	6,578	2,383	818	818
2014-2015	Meadowlark Lane	Meander Road	Cul-de-sac	900	32	3,200	1,159	398	398
2014-2015	Meadowlark Lane		Cul-de-sac	50		872	316	108	108
2014-2015	Overlook Circle	Riverview Road	Cul-de-sac	160	32	569	206	71	71
2014-2015	Overlook Circle		Cul-de-sac	45		707	256	88	88
2014-2015	Riverview Road	Duininck Road	9th Street North	2,700	32	9,600	3,478	1,193	1,193
				1.46	Total	28,690	10,393	3,566	3,566

Table 2

Street	Curb & Gutter	From	To	Current Recommendation	Const. Year
Jonquil Lane	No	109 th Avenue North	Cul-de-sac	Gravel- Grade & Class 5	Annually
Katydid Lane NE	No	Cul-de-sac	Cul-de-sac	Gravel- Grade & Class 5	Annually
Jandel Avenue NE	No	4 th Street NE	Division Street	Gravel- Grade & Class 5	Annually
Street	Curb & Gutter	From	To	Current Recommendation	Const. Year
Kayla Lane	Yes	1360' south of Beebe Lk Rd	3310' south of Beebe Lk Rd	Chip Seal Coat	2010
Kaitlin Avenue	Yes	Kayla Lane	772' south of Kayla Lane	Chip Seal Coat	2010
6th Street NE	Yes	Kayla Lane	Cul-de-sac	Chip Seal Coat	2010
Kalland Lane NE	Yes	Kayla Lane	Cul-de-sac	Chip Seal Coat	2010
109 th Avenue North	No	Settler's Lane	Cul-de-sac	Chip Seal Coat	2010
Main Street	Yes	La Beauxe	400' east of La Beauxe	Chip Seal Coat	2010
Church Street	Yes	Church Parking Lot	La Beauxe	Chip Seal Coat	2010
Garnet Court	Yes	River Road	Cul-de-sac	Chip Seal Coat	2010
8 th Street N	No	River Road	Meander Road	Chip Seal Coat	2010
River Road	No	8th Street N	15th Street NE	Chip Seal Coat	2010
Crow River Drive	No	River Road	Cul-de-sac	Chip Seal Coat	2011
Church Street	No	River Road	Church Parking Lot	Chip Seal Coat	2011
Main Street	Yes	400' east of La Beauxe	Mill Pond	Chip Seal Coat	2011
River Road	Yes	Mill Pond Trail	Riverview Road	Chip Seal Coat	2011
Lamont Avenue	No	8 th Street N	Cul-de-sac	Chip Seal Coat	2011
10 th Street N	No	Lamont Avenue	River Road	Chip Seal Coat	2011
8 th Street N	No	Lamont Avenue	River Road	Chip Seal Coat	2011
5 th Street NE	No	La Beauxe	River Road	Chip Seal Coat	2011
4 th Street NE	No	La Beauxe	Cul-de-sac	Chip Seal Coat	2011
Prairie Lane	No	109 th Avenue North	Ann Circle	Chip Seal Coat	2011
Ann Circle	No	Prairie Lane	Cul-de-sac	Chip Seal Coat	2011
River Road	Yes	Riverview Road	8th Street N	Chip Seal Coat	2012
Irvine Drive	Yes	15 th Street NE	15 th Street NE	Chip Seal Coat	2012
Easterly Oaks	Yes	Irvine Drive	12 th Street	Chip Seal Coat	2012
12 th Street	Yes	River Road	Irvine Drive	Chip Seal Coat	2012
12 th Street	Yes	Irvine Drive	Rolling Oaks Drive	Chip Seal Coat	2012
Rolling Oaks Drive	Yes	14 th Street	Cul-de-sac	Chip Seal Coat	2012
14 th Street	Yes	Rolling Oaks Drive	Irvine Drive	Chip Seal Coat	2012
Lambert Court	Yes	Oakwood Avenue	Cul-de-sac	Chip Seal Coat	2012
Oakwood Avenue	Yes	14th Street	Irvine Drive	Chip Seal Coat	2012
Kaitlin Avenue	Yes	Kayla Lane	710' south of Kayla Lane	Chip Seal Coat	2012
Kayla Lane	Yes	3310' south of Beebe Lk Rd	Kadler Circle	Chip Seal Coat	2012
Kadler Circle	Yes			Chip Seal Coat	2012
Kalder Avenue NE	Yes	4th Street NE	Kadler Circle	Chip Seal Coat	2012
Kalder Avenue NE	Yes	Kadler Circle	Beebe Lake Road	Chip Seal Coat	2012
Kalea Court	Yes	Kadler Circle	Cul-de-sac	Chip Seal Coat	2012
Kalea Court	Yes		Cul-de-sac	Chip Seal Coat	2012
Jasmine Avenue NE	Yes	Kalder Avenue NE	Jasmine Court NE	Chip Seal Coat	2012
Jasmine Court NE	Yes		Cul-de-sac	Chip Seal Coat	2012
10 th Street N	Yes	River Road	Mallard Street NE	Chip Seal Coat	2013
Mallard Street NE	Yes	8th Street N	220' north of Meadowbrook Ave	Chip Seal Coat	2013
Meadowbrook Avenue NE	Yes	Mallard Street NE	10 th Street N	Chip Seal Coat	2013
Lynwood Avenue NE	Yes	10 th Street N	Meadowbrook Avenue NE	Chip Seal Coat	2013
Lynwood Court	Yes	Lynwood Avenue NE	Cul-de-sac	Chip Seal Coat	2013
109 th Avenue North	Yes	Rosedale Avenue	Settler's Lane	Chip Seal Coat	2013
Settler's Lane	No	109 th Avenue North	Rosedale Avenue	Chip Seal Coat	2013
Cottage Lane	Yes	Settler's Lane	108 th Avenue North	Chip Seal Coat	2013
108 th Avenue North	Yes	Cul-de-sac	107 th Avenue North	Chip Seal Coat	2013
107 th Avenue North	Yes	108 th Avenue North	106th Avenue North	Chip Seal Coat	2013
106 th Avenue North	Yes	107 th Avenue North	Settler's Lane	Chip Seal Coat	2013
Mallard Street NE	Yes	220' north of Meadowbrook Ave	Cul-de-sac	Chip Seal Coat	2013
Erin Street N	Yes	Mallard Street	11th Street N	Chip Seal Coat	2013
11th Street N	Yes	River Road	Mallard Street	Chip Seal Coat	2013
Emerald Street	Yes	11th Street N	Mallard Street	Chip Seal Coat	2013
10 th Street NE	No	La Beauxe	Ladyslipper Lane NE	Chip Seal Coat	2014
Ladyslipper Lane NE	No	Cul-de-sac	Cul-de-sac	Chip Seal Coat	2014
9 th Street NE	No	La Beauxe	Katydid Lane NE	Chip Seal Coat	2014
107 th Avenue North	Yes	Rosedale Avenue	Cul-de-sac	Chip Seal Coat	2014
Kayla Lane	Yes	Beebe Lake Road	Cul-de-sac	Chip Seal Coat	2014

Table 2

Street	Curb & Gutter	From	To	Current Recommendation	Const. Year
Kalen Drive	Yes	Kayla Lane	Cul-de-sac	Chip Seal Coat	2014
Kalen Lane	Yes	Kayla Lane	Cul-de-sac	Chip Seal Coat	2014
Jandel Avenue	No	4 th Street NE	Cul-de-sac	Chip Seal Coat	2014
Jandel Court	No	Jandel Avenue NE	Cul-de-sac	Chip Seal Coat	2014
Ginseng Lane	No	109th Avenue North	Cul-de-sac	Chip Seal Coat	2014
Whitetail Drive	No	Crow-Hassan Park Road	County Road 117	Chip Seal Coat	2014
Whitetail Lane	No	Whitetail Drive	Cul-de-sac	Chip Seal Coat	2014

Table 2

Street	Curb & Gutter	From	To	Current Recommendation	Const. Year
Kadler Avenue NE	No	Division Street	4 th Street NE	Chip Seal Coat	2015
3 rd Street NE	No	Kadler Avenue NE	4 th Street NE	Chip Seal Coat	2015
4 th Street NE	No	Cul-de-sac	Jandel Avenue NE	Chip Seal Coat	2015
Jansen Avenue NE	No	4 th Street NE	Cul-de-sac	Chip Seal Coat	2015
Riverview Road	No	River Road	Duininck Road	Chip Seal Coat	2015
Mill Pond Trail	No	Main Street	Cul-de-sac	Chip Seal Coat	2015

Street	Curb & Gutter	From	To	Current Recommendation	Const. Year
River Road	No	8th Street North	15th Street NE	Mill and Overlay	2013
9 th Street N	No	Riverview Road	Meander Road	Reconstruction	2014-2015
8th Street N	No	Meander	Riverview Road	Reconstruction	2014-2015
Meander Road	No	9 th Street N	Riverview Road	Reconstruction	2014-2015
Meadowlark Lane	No	Meander Road	Cul-de-sac	Reconstruction	2014-2015
Meadowlark Lane	No		Cul-de-sac	Reconstruction	2014-2015
Overlook Circle	No	Riverview Road	Cul-de-sac	Reconstruction	2014-2015
Overlook Circle	No		Cul-de-sac	Reconstruction	2014-2015
Riverview Road	No	Duininck Road	9th Street North	Reconstruction	2014-2015

Table 3

Proposed Street Maintenance Costs					
Year	Proposed Project Locations	Gravel Street Restoration	Crack Sealing	Chip Sealing	Total Yearly Maintenance Budget
		a	b	c	1
2010	Kayla Lane, Kaitlin Avenue, 6th Street NE, Kalland Lane NE, 109th Avenue N, Main Street, Church Street, Garnet Court, 8th Street N, River Road	\$ -	\$ -	\$ 62,869.28	\$ 62,869.28
2011	Crow River Drive, Church Street, Main Street, River Road, Lamont Avenue, 10th Street N, 8th Street N, 4th Street NE, 5th Street NE, Prairie Lane, Ann Circle	\$ 4,000.00	\$ 5,000.00	\$ 66,443.58	\$ 75,443.58
2012	River Road, Irvine Drive, Easterly Oaks, 12th Street, Rolling Oaks Drive, 14th Street, Lambert Court, Oakwood Avenue	\$ 4,120.00	\$ 5,150.00	\$ 105,641.28	\$ 114,911.28
2013	10th Street N, Mallard Street NE, Meadowbrook Avenue NE, Lynwood Avenue NE, Lynwood Court, 109th Avenue N, Settler's Lane, Cottage Lane, 108th Avenue N, 107th Avenue N, 106th Avenue N	\$ 4,243.60	\$ 5,304.50	\$ 87,815.78	\$ 97,363.88
2014	10th Street N, Ladyslipper Lane NE, 107th Avenue N, Kayla Lane, Kalen Drive, Kalen Lane, Jandel Avenue, Jandel Court, Ginseng Lane, Whitetail Drive, Whitetail Lane	\$ 4,370.91	\$ 5,463.64	\$ 58,039.57	\$ 67,874.11

Note: 1=a+b+c

Proposed Street Mill and Overlay Costs		
Year	Proposed Project Locations	Project Cost
2013	River Road	\$ 138,899.75

\$ 418,462.11

\$ 83,692.42

Proposed Street Reconstruction Costs		
Year	Proposed Project Locations	Project Cost
2014-2015	9th Street N, 8th Street N, Meander Road, Meadowlark Lane, Overlook Circle, Riverview Road	\$ 2,073,637.92

City of Hanover
 2010 Chip Seal Coat
 Quantity Calculations
 WSB Project # 1272-50

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Units	Qty	Unit Price	Total Price
Schedule A - Chip Seal for						
1	2123.610	STREET SWEEPING	LUMP SUM	1	\$2,500.00	\$2,500.00
2	2356.505	BITUMINOUS MATERIAL FOR SEAL COAT (CRS-2)	GALLON	10584	\$3.00	\$31,752.38
3	2356.507	SEAL COAT AGGREGATE (FA-2)	TON	423	\$60.00	\$25,401.90
TOTAL SCHEDULE A =						\$57,154.28
10% CONTINGENCY =						\$5,715.00
TOTAL PROJECT COST =						\$62,869.28

City of Hanover
 2011 Chip Seal Coat
 Quantity Calculations
 WSB Project # 1272-50

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Units	Qty	Unit Price	Total Price
Schedule A - Chip Seal for						
1	2123.610	STREET SWEEPING	LUMP SUM	1	\$2,500.00	\$2,500.00
2	2356.505	BITUMINOUS MATERIAL FOR SEAL COAT (CRS-2)	GALLON	11186	\$3.00	\$33,557.54
3	2356.507	SEAL COAT AGGREGATE (FA-2)	TON	447	\$60.00	\$26,846.03
TOTAL SCHEDULE A =						\$60,403.58
10% CONTINGENCY =						\$6,040.00
TOTAL PROJECT COST =						\$66,443.58

City of Hanover
 2012 Chip Seal Coat
 Quantity Calculations
 WSB Project # 1272-50

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Units	Qty	Unit Price	Total Price
Schedule A - Chip Seal for						
1	2123.610	STREET SWEEPING	LUMP SUM	1	\$2,500.00	\$2,500.00
2	2356.505	BITUMINOUS MATERIAL FOR SEAL COAT (CRS-2)	GALLON	17785	\$3.00	\$53,354.04
3	2356.507	SEAL COAT AGGREGATE (FA-2)	TON	711	\$60.00	\$42,683.23
TOTAL SCHEDULE A =						\$96,037.28
10% CONTINGENCY =						\$9,604.00
TOTAL PROJECT COST =						\$105,641.28

City of Hanover
 2013 Chip Seal Coat
 Quantity Calculations
 WSB Project # 1272-50

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Units	Qty	Unit Price	Total Price
Schedule A - Chip Seal for						
1	2123.610	STREET SWEEPING	LUMP SUM	1	\$2,500.00	\$2,500.00
2	2356.505	BITUMINOUS MATERIAL FOR SEAL COAT (CRS-2)	GALLON	14784	\$3.00	\$44,351.54
3	2356.507	SEAL COAT AGGREGATE (FA-2)	TON	591	\$60.00	\$35,481.23
TOTAL SCHEDULE A =						\$79,832.78
10% CONTINGENCY =						\$7,983.00
TOTAL PROJECT COST =						\$87,815.78

City of Hanover
 2014 Chip Seal Coat
 Quantity Calculations
 WSB Project # 1272-50

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Units	Qty	Unit Price	Total Price
Schedule A - Chip Seal for						
1	2123.610	STREET SWEEPING	LUMP SUM	1	\$2,500.00	\$2,500.00
2	2356.505	BITUMINOUS MATERIAL FOR SEAL COAT (CRS-2)	GALLON	9771	\$3.00	\$29,313.09
3	2356.507	SEAL COAT AGGREGATE (FA-2)	TON	391	\$60.00	\$23,450.47
TOTAL SCHEDULE A =						\$52,763.57
10% CONTINGENCY =						\$5,276.00
TOTAL PROJECT COST =						\$58,039.57

City of Hanover
 River Road Bituminous Overlay (8th Street N to 15th Street NE)
 Quantity Calculations
 WSB Project # 1272-50

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Notes	Units	Qty	Unit Price	Total Price
Schedule A - Surface Improvements							
1	2021.501	MOBILIZATION		LUMP SUM	1	\$ 6,500.00	\$ 6,500.00
2	2232.501	MILL BITUMINOUS SURFACE (1.75")		SQ YD	10,507	\$ 1.00	\$ 10,506.67
3	2357.502	BITUMINOUS MATERIAL FOR TACK COAT		GAL.	1,051	\$ 1.80	\$ 1,891.20
4	2360.501	TYPE SP 12.5 WEARING COURSE MIXTURE (2,C)		TON	1,306	\$ 64.00	\$ 83,582.63
5	2563.601	TRAFFIC CONTROL		LUMP SUM	1	\$ 3,500.00	\$ 3,500.00
6	2582.502	4" SOLID LINE WHITE-EPOXY		LIN. FT.	7,600	\$ 1.20	\$ 9,120.00
7	2582.502	4" DOUBLE SOLID LINE YELLOW-EPOXY		LIN. FT.	3,800	\$ 2.40	\$ 9,120.00
8	2582.503	CROSSWALK MARKING-EPOXY		SQ. FT.	342	\$ 6.00	\$ 2,052.00
						TOTAL SCHEDULE A = \$	126,272.50
						10% CONTINGENCY = \$	12,627.25
						PROJECT TOTAL = \$	138,899.75

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Notes	Units	Qty	Unit Price	Total Price
Schedule A - Surface Improvements							
1	2021.501	MOBILIZATION		LUMP SUM	1	\$60,000.00	\$ 60,000.00
2	2101.502	CLEARING		TREE	2	\$ 300.00	\$ 600.00
3	2101.507	GRUBBING		TREE	2	\$ 200.00	\$ 400.00
4	2104.505	REMOVE CULVERT		LIN FT	480	\$ 5.00	\$ 2,400.00
5	2104.505	REMOVE CONCRETE PAVEMENT		SQ YD	320	\$ 3.50	\$ 1,120.00
6	2104.505	REMOVE BITUMINOUS PAVEMENT		SQ YD	28,180	\$ 2.50	\$ 70,450.00
7	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH)		LIN FT	400	\$ 4.00	\$ 1,600.00
8	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)		LIN FT	1,200	\$ 3.00	\$ 3,600.00
9	2104.523	SALVAGE SIGN		EACH	6	\$ 25.00	\$ 150.00
10	2105.501	COMMON EXCAVATION (P)		CU YD	13,425	\$ 8.00	\$ 107,400.00
11	2105.522	SELECT GRANULAR BORROW (CV)		CU YD	9,563	\$ 11.00	\$ 105,196.06
12	2105.525	TOPSOIL BORROW (LV)		CU YD	300	\$ 13.00	\$ 3,900.00
13	2211.501	AGGREGATE BASE CLASS 5		TON	10,393	\$ 13.00	\$ 135,107.60
14	2350.501	TYPE LV 4 WEARING COURSE MIXTURE (C)		TON	3,566	\$ 72.00	\$ 256,762.53
15	2350.502	TYPE LV 3 NON WEARING COURSE MIXTURE (C)		TON	3,566	\$ 68.00	\$ 242,497.95
16	2357.502	BITUMINOUS MATERIAL FOR TACK COAT		GALLON	1,345	\$ 3.00	\$ 4,035.00
17	2531.507	6" CONCRETE DRIVEWAY PAVEMENT		SQ YD	320	\$ 42.00	\$ 13,440.00
18	2506.603	18" CM PIPE CULVERT		LIN FT	480	\$ 28.00	\$ 13,440.00
19	2506.603	18" METAL APRON		EACH	12	\$ 500.00	\$ 6,000.00
20	2563.601	TRAFFIC CONTROL		LUMP SUM	1	\$ 3,000.00	\$ 3,000.00
21	2564.533	FURNISH SIGN PANELS TYPE C		SQ FT	24	\$ 17.50	\$ 420.00
22	2564.533	FURNISH SIGN PANELS TYPE D		SQ FT	23	\$ 55.00	\$ 1,237.50
23	2571.502	DECIDUOUS TREE 2.5" CAL B&B		EACH	2	\$ 425.00	\$ 850.00
24	2573.502	SILT FENCE, TYPE HEAVY DUTY		LIN FT	1,000	\$ 2.00	\$ 2,000.00
25	2575.605	SEEDING		ACRE	3	\$ 2,000.00	\$ 6,000.00
TOTAL SCHEDULE A =							\$ 1,041,606.63

Schedule B - Water System Improvements							
26	2504.602	CONNECT TO EXISTING WATER MAIN		EACH	2	\$ 1,500.00	\$ 3,000.00
27	2504.602	1" CORPORATION STOP		EACH	70	\$ 125.00	\$ 8,750.00
28	2504.602	8" GATE VALVE AND BOX		EACH	14	\$ 1,100.00	\$ 15,400.00
29	2504.602	1" CURB STOP & BOX		EACH	70	\$ 175.00	\$ 12,250.00
30	2504.602	HYDRANT ASSEMBLY		EACH	8	\$ 2,500.00	\$ 20,000.00
31	2504.603	1" TYPE K COPPER PIPE		LIN FT	4,200	\$ 22.00	\$ 92,400.00
32	2504.603	6" WATER MAIN-DUCT IRON CL 52 W/ POLY WRAP		LIN FT	160	\$ 28.00	\$ 4,480.00
33	2504.603	8" PVC WATER MAIN		LIN FT	8,055	\$ 26.00	\$ 209,430.00
34	2504.604	4" POLYSTYRENE INSULATION		SQ YD	100	\$ 40.00	\$ 4,000.00
35	2504.608	DUCTILE IRON FITTINGS		POUND	7,800	\$ 3.00	\$ 23,400.00
TOTAL SCHEDULE B =							\$ 393,110.00

ENGINEERS OPINION OF PROBABLE COST

No.	Mat. No.	Item	Notes	Units	Qty	Unit Price	Total Price
Schedule C - Sanitary Sewer Improvements							
36	2451.602	GRANULAR FOUNDATION AND/OR BEDDING		TON	100	\$ 40.00	\$ 4,000.00
37	2503.602	CONNECT TO EXISTING SANITARY SEWER		EACH	1	\$ 1,500.00	\$ 1,500.00
38	2503.602	CONNECT TO EXISTING MANHOLES (SAN)		EACH	1	\$ 1,000.00	\$ 1,000.00
39	2503.602	RECONNECT TO EXISTING SANITARY SEWER SERVICE		EACH	70	\$ 200.00	\$ 14,000.00
40	2503.602	CHIMNEY SEALS		EACH	25	\$ 250.00	\$ 6,250.00
41	2503.602	8"X4" PVC WYE		EACH	70	\$ 125.00	\$ 8,750.00
42	2503.603	4" PVC PIPE SEWER - SDR 26		LIN FT	4,800	\$ 26.00	\$ 124,800.00
43	2503.603	TELEWISE SANITARY SEWER		LIN FT	8,055	\$ 1.25	\$ 10,068.75
44	2503.603	8" PVC PIPE SEWER - SDR 35		LIN FT	8,055	\$ 28.00	\$ 225,540.00
45	2506.516	CASTING ASSEMBLY (SANITARY)		EACH	25	\$ 500.00	\$ 12,500.00
46	2506.603	CONST 48" DIA SAN SEWER MANHOLE		LIN FT	300	\$ 140.00	\$ 42,000.00
TOTAL SCHEDULE C =							\$ 450,408.75
TOTAL PROJECT COST =							\$ 1,885,125.38
10% CONTINGENCY =							\$ 188,512.54
GRAND TOTAL =							\$ 2,073,637.92