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Technical Report

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*Street and Alley Pavement  
Evaluations &  
Recommendations for  
Gettysburg Borough  
Adams County,  
Pennsylvania*

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## TABLE OF CONTENTS

EXECUTIVE SUMMARY.....	1
INTRODUCTION/ PHILOSOPHY.....	2
FUNDING .....	3
PAVEMENT EVALUATION & RECOMMENDATIONS FOR STREETS.....	5
STREET LIST .....	6
MAINTENANCE, PRESERVATION, AND REHABILITATION OPTIONS.....	8
PAVEMENT HISTORY .....	10
5 YEAR MAINTENANCE PLAN.....	15
PAVEMENT EVALUATION & RECOMMENDATIONS FOR ALLEYS.....	16
ALLEYS LIST .....	17
MAINTENANCE, PRESERVATION, AND REHABILITATION OPTIONS.....	19
PAVEMENT HISTORY.....	21
5 YEAR MAINTENANCE PLAN.....	28

### APPENDICES

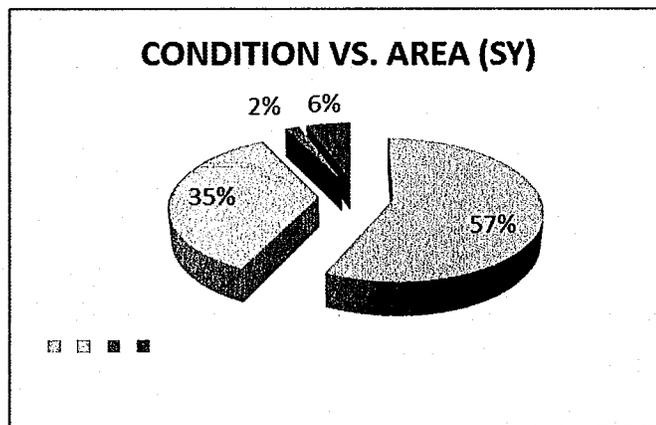
LIQUID FUELS RECORDED STREET MILAGE TOTALS .....	A
FIELD RATINGS FOR STREETS.....	B
FIELD RATINGS FOR ALLEYS .....	C
COST ESTIMATES FOR STREETS.....	D
COST ESTIMATES FOR ALLEYS .....	E

## EXECUTIVE SUMMARY

In an effort to quantify the quality of Gettysburg Borough's roadway network system, an extensive survey was performed throughout the Borough. The survey included the collection of roadway surface conditions and drainage conditions. All of this data has been compiled into the following report and five (5) year maintenance plan.

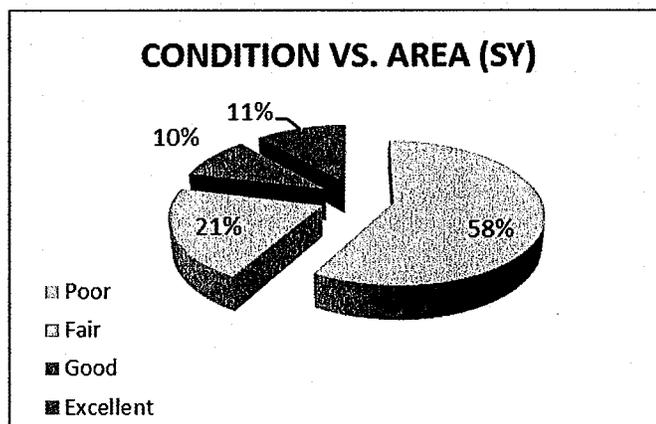
The purpose of this report is to provide the Borough with a working maintenance plan from which yearly budgeting can be determined and future projects can be planned. Due to the large number of roadways within the Borough, this report has been divided into two major parts, one for the streets and one for the alleys. In summary, the quality of streets, much like the alleys throughout the Borough, is generally poor.

The following chart shows the overall condition of the Borough's streets.



The above chart shows the percentage of streets that are in each condition category based on square yardage. From this chart it can be seen that most of the streets (57%) are in poor condition.

The following chart shows the overall condition of the Borough's alleys.



The above chart shows the percentage of alleys that are in each condition category based on square yardage. From this chart it can be seen that most of the alleys (58%) are in poor condition.

## INTRODUCTION/ PHILOSOPHY

Pavement management philosophy includes preservation and maintenance procedures as opposed to the traditional "worst first" philosophy. The cost benefits of a sound pavement preservation program can be seen in figure 1. Spending one dollar on preservation treatments can eliminate or delay the need to spend up to ten times as much on rehabilitation or reconstruction costs. Throughout the analysis an emphasis was placed on the importance of asset management by preserving roadways in good to excellent condition using this current pavement management philosophy.

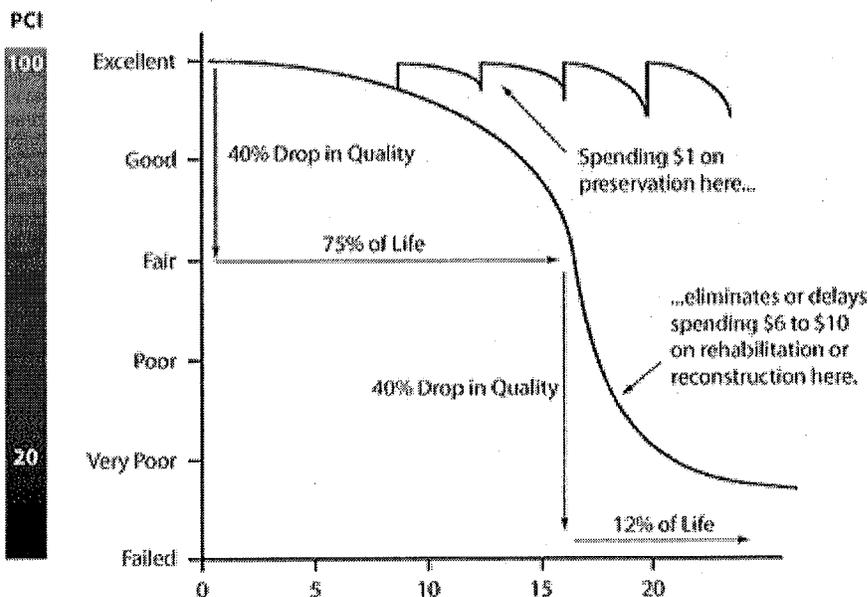


Figure 1 – Pavement Distress Curve (FHWA)

The initial pavement condition data collection was performed in the summer and fall of 2010, by C.S. Davidson, Inc. staff. During the initial data collection process, five common distresses were rated including: Fatigue (Alligator) Cracking, Longitudinal Cracking, Transverse Cracking, Rutting, and Patching. From these individual distress ratings and an assessment of the pavements weathering, an overall roadway rating was calculated with zero being a road in the worst condition and 100 being a road in excellent condition. The following scale was used to determine the overall surface condition of the roadway:

- 0-60 Poor
- 61-84 Fair
- 85-94 Good
- 95-100 Excellent

After calculating a roadway rating in the office, a field view was performed, to determine an appropriate treatment and decide which roadways could be treated together based upon similar distresses and geographic locations. This field view was performed by Christopher Toms, P.E. and Chris Metz, E.I.T. of C.S. Davidson, Inc. Final roadway treatment recommendations were provided with the interest of Gettysburg Borough, pavement management philosophy, and industry best practices in mind. It should be noted that the above rating scale was used solely to determine the condition of the pavement surface. Additional features evaluated during the data collection process included overall roadway drainage conditions and curb conditions.

## FUNDING

Budgetary cost estimates for each street or street segment are included in the 5 year plan and can be found in Appendix D for all the streets and Appendix E for all the alleys. The estimates were created using a unit cost for each type of treatment prescribed: \$3.00 per square yard for micro surface treatments, \$50.00 per square yard for contracted base repair, \$25.00 per square yard for contracted binder repair; \$4.00 per square yard for scratch course and \$17.00 per square yard for contracted mill and overlay projects. For roadways receiving base replacement and a 3" overlay, a unit cost of \$12.00 per square yard was used based on provided estimates from the Borough for those alleys being treated in 2010 where the Borough staff performed the work with rented equipment. Each estimate includes a 15% design contingency meant to cover design, bidding, contract administration, inspection, and occasional incidental non-pavement construction such as culverts or driveway repairs. This contingency may be high for some projects and low for others, but is appropriate for long term budgetary planning.

In conclusion, the total estimated cost of maintenance for all the streets located within the Borough was about \$7.2 million and \$610,000 for all alleys. Asphalt paving should be minimally maintained within 15 years. Thus the Borough would need to allocate \$500,000 a year toward street maintenance and \$40,000 per year for alley maintenance.

## PIB LOANS

Low interest loans are available through the Pennsylvania Infrastructure Bank (PIB). The PIB is a PennDOT operated program that provides financing alternatives to help fund transportation projects. As budgets shrink, this is a way to accelerate priority projects that otherwise wouldn't get funding. Loans vary based on each individual situation, but the maximum term for a PIB loan is 10 years. Payment plans are scheduled annually, bi-annually, quarterly, or monthly. The loans have a fixed interest rate set at one-half the prime lending rate at the time the loan is submitted ([www.federalreserve.gov](http://www.federalreserve.gov)).

## CDBG

CDBG funds should be allocated where curb, curb ramps and storm sewer are being replaced. We would recommend that any additional CDBG funds be allocated to these types of improvements. Almost all of the streets within the Borough have existing sidewalk that require improvements.

## LIQUID FUELS

One possibility we are recommending that the Borough look into is widening alleys receiving a treatment of base replacement and 3" overlay. Where this is possible and feasible, alleys could be widened to 16 feet with additional right-of-way added to obtain a 16 foot right-of-way width. This would make these alleys eligible for county liquid fuels funds.

The following alleys receiving treatment in the 5 year maintenance plan would be good candidates to widen. The prepared cost estimates (Appendix E) do not include additional cost for widening any alley. Additional cost would include Right-of-way acquisition and additional pavement material. Other alleys could also be widened where it is feasible to do so.

Bream Alley – currently 13'

Brickyard Alley- currently 12'

Hudson Alley – (Fourth Street to Sixth Street) – currently 12'

Hartzell Alley – (Barlow Street to Stratton Street) – currently 12'

Levan Alley – currently 10’  
Racehorse Alley (Carlisle St. to Buford Avenue)-width varies from 10’ to 25’  
Roth Alley – currently 11’  
United Alley – currently 10’ to 16’  
Zerfing Alley (Fifth to Sixth Street) – currently 10’

We also recommend that the Borough contact the local PennDOT municipal services representative as alleys are improved and become eligible for liquid fuels funding and update their total mileage for county liquid fuel each year. Additionally, the Borough should review the following alleys for addition to their list of liquid fuels eligible routes. It appears these alleys meet the requirements for some pavement sections based upon pavement width. Right-of-Way widths should be reviewed to determine eligibility.

Hospital Alley	0.036 miles
Racehorse Alley	0.185 miles (Parking Garage to Reaser Alley)
Schoolhouse Alley	0.168 miles
<u>Zerfing Alley</u>	<u>0.084 miles (Portion from Franklin Street to West Street)</u>

**Total Additional Mileage**      **0.473 miles**

*Pavement Evaluations &  
Recommendations for  
Streets*

## STREET LIST

The following is a list of all the streets that were reviewed. The entire network of streets consists of approximately 15.08 miles. The lengths provided below are those measured by our office while performing field evaluations. Streets were evaluated starting at the centerline of the intersecting street with the first station 0+00 not being used in the rating determination. The measured length was from the edge of the road curb line as indicated by a change in pavement materials. Lengths of streets do not include intersecting roadways.

<u>Roadway</u>	<u>Length (Mi.)</u>	<u>From</u>	<u>To</u>
Barlow Street	0.244	Fourth Street	Markley Alley
Breckenridge Street	0.291	Baltimore Street	West Street
Constitution Avenue	0.461	Lincoln Avenue	Washington Street
Culp Street	0.175	Steinwehr Avenue	Fairview Avenue
East Broadway Street	0.288	Fourth Street	Carlisle Street
East Lincoln Avenue	0.133	Fourth Street	Old Harrisburg Road
East Middle Street	0.598	Sixth Street	Baltimore Street
East Railroad Street	0.221	Dead End	Fourth Street
Elm Street	0.090	Hay Street	Buford Avenue
Fairview Avenue	0.441	Long lane	Gettys Street
Fifth Street	0.267	Racehorse Alley	Middle Street
Fourth Street	0.580	East Broadway Street	Middle Street
Franklin Street	0.114	Breckenridge Street	High Street
Franklin Street	0.244	High Street	Cul de Sac
Gettys Street	0.234	Washington Street	Long Lane
Hay Street	0.091	Middle Street	Hamme Alley
Hay Street	0.248	Middle Street	Buford Avenue
High Street	0.581	Stratton Street	Howard Avenue
Highland Avenue	0.484	Long Lane	John's Avenue
Hillcrest Plaza	0.093	Locust Avenue	Weaver Alley
Howard Avenue	0.210	Prince Street	Middle Street
Howard Avenue	0.086	McMillian Street	Prince Street
Howard Avenue	0.180	Middle Street	Buford Avenue
Johns Avenue	0.509	Long Lane	Washington Street
King Street	0.278	Steinwehr Avenue	Long Lane
Lefever Street	0.382	Middle Street	Baltimore Street
Liberty Street	0.076	Middle Street	Chambersburg Street
Locust Avenue	0.071	Baltimore Street	Wainwright Avenue
Long Lane	0.612	Cul De Sac	Breckenridge Street
Long Lane Section 1	0.129	Steinwehr Avenue	Highland Avenue + 40'
Long Lane Section 1	0.104	Highland Avenue + 40'	Sunset Avenue
McMillan Street	0.043	Ridge Avenue	Howard Avenue
Mummasburg Street	0.106	Stevens Street	Water Street
Park Street	0.058	Long Lane	Sunset Avenue
Pine Street	0.058	Barlow Street	Dead End
Prince Street	0.068	Ridge Avenue	Howard Avenue
Queen Street	0.295	Steinwehr Avenue	Long Lane
Railroad Street	0.112	Carlisle Street	Washington Street
Red Patch Avenue	0.083	Ridge Avenue	Dead End

## STREET REPORT

<u>Roadway</u>	<u>Length (Mi.)</u>	<u>From</u>	<u>To</u>
Reynolds Street section 1	0.149	Middle Street	Buford Avenue
Reynolds Street Section 2	0.038	High Street	Legion Alley
Ridge Avenue	0.273	Middle Street	McMillian Street
Seminary Avenue	0.168	Buford Avenue	Hay Street
Sixth Street	0.312	Middle Street	York Street
South Street	0.112	Baltimore Street	Washington Street
Spring Avenue	0.395	Seminary Ridge Avenue	West Street
Stevens Street	0.224	Stratton Street	Washington Street
Stratton Street	0.620	Wall Alley	Lincoln Avenue
Sunset Avenue	0.394	Long Lane	Park Street
Third Street	0.172	Middle Street	Racehorse Alley
Victor Street	0.116	Pine Street	Fourth Street
Village Drive	0.153	West Street	Cul de Sac
Wade Avenue	0.029	Baltimore Street	Schoolhouse Alley
Wainwright Avenue	0.070	Lefever Street	Locust Avenue
Washington Street	0.208	Steinwehr Avenue	Hospital Alley
Washington Street	0.156	Hospital Alley	Breckenridge Street
Washington Street	0.114	Breckenridge Street	High Street
Washington Street	0.162	High Street	Chambersburg Street
Washington Street	0.537	Chambersburg Street	Brickyard Alley
Water St	0.436	Washington Street	Water Street
West Broadway Street	0.398	Carlisle Street	Constitution Avenue
West Lincoln (12+71 to 17+95)	0.099	College Avenue	Pavement Seam
West Lincoln (17+95 to 25+00)	0.134	Pavement Seam	End at college entrance
West St	0.268	Buford Avenue	Breckenridge Street

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## **MAINTENANCE, PRESERVATION, AND REHABILITATION OPTIONS**

Based upon Borough preferences and our observations, we have recommended the following treatment options depending upon road conditions.

Streets that are in the poorest condition are generally recommended to be improved with full depth reclamation of the existing pavement and base followed by the placement of a binder course and a wearing overlay. Reclamation involves pulverization of the existing pavement and subbase followed by placement of a binder course and a wearing surface course. The existing road material including the stone subbase and possibly the underlying soil is pulverized and then a bonding agent is added (as needed). The uniform mixture is placed and compacted to create a stable road base. This process minimizes waste of existing materials. Streets identified for reclamation require a core sample to determine the thickness of each layer. These cores should be pulverized and tested with various additives, such as lime, Portland cement, or calcium chloride, to determine the best additive mix for a stable reclaimed subbase.

If the existing pavement section and soils are not appropriate for reclamation, a complete reconstruction may be necessary. This entails excavating the existing base material and soil, if necessary, placing and compacting a stone base, followed by the application of an asphalt binder course and wearing course. Both a reclamation and reconstruction treatment option would allow an opportunity to build up the pavement profile to promote drainage.

The third option for streets in the poorest condition is to mill and overlay with some base repair. Most streets that received this recommendation are experiencing major cracking in the existing pavement surface, but do not appear to have a major subgrade issue. Due to the age of the pavement, we recommend milling and overlaying to maintain curb reveal and remove the poor pavement. Additionally, most of these streets will require small amounts of binder and base repair where the subbase appears to be failing.

For Streets that are in a good/fair condition, we are recommending two different options. The first option is to receive a 1.5" mill and overlay. These streets, like those in poor condition, are experiencing cracking in the existing pavement. Any Street that is proposed to receive a 1.5" mill and overlay should be cored and reviewed. These recommendations may need to be altered based on the amount of existing pavement on these Streets. If there isn't adequate existing pavement thickness after the milling is completed then alterations will be required. No overlay wearing course should be placed on an inadequate binder course.

The second option for streets in good/fair condition is to perform a surface treatment. This recommendation will provide a more cost effective treatment for streets where the pavement is experiencing minor cracking, mostly longitudinal.

We recommend that streets in excellent condition receive a surface treatment application. Some roads in good/fair condition also fall in this category if they have a sound base, or if the base is repaired, and a good surface is present. There are many Surface treatments available; however because of the past experience the Borough has had with microsurfacing and due to the aesthetics that it provides, we are recommending microsurfacing for all streets requiring a surface treatment. Microsurfacing consists of a mixture of fine aggregate and asphalt emulsion. The mix is formulated for a very quick cure and traffic can typically return within one hour. Because of its quick curing ability microsurfacing can be placed thicker than other emulsion surface treatments and can be used

to fill ruts and for minor re-profiling. It is not intended as a crack treatment and will not prevent cracks in underlying pavements from reflecting through to the surface. Microsurfacing has been estimated to last 6 to 8 years. The treatments life depends on the stability of the microsurfacing, the traffic levels, construction techniques, and the condition of the underlying pavement. There are a variety of different microsurfacing mix designs that should be considered based upon the existing distresses that are present.

In addition to receiving a surface treatment, some streets in good and fair condition will require base or binder repair. If a street is to receive a surface treatment then all base and binder repair along with crack sealing should be done prior to any surface treatment.

As streets in the Borough are improved to good or excellent condition, a surface treatment program is necessary to maintain the roads in this condition. For streets within the Borough, we generally recommend the continued use of microsurfacing with applications planned for every five to ten years.

Streets in good to excellent condition that show minor signs of cracking should receive only the application of crack sealant as needed. It should be noted that routes in good condition should still receive sealant in years that they are not being treated and should not be allowed to deteriorate to a fair condition.

Drainage of water from pavements is always an important consideration when performing roadway rehabilitation. Excess water combined with traffic loads often lead to early pavement distress. Methods of treating this water generally consist of preventing the water from entering the pavement which is often addressed with crack sealing and surface treatments, and providing drainage to quickly remove excess water. Almost all the streets have some stormsewer. Additional stormsewer should be added where drainage issues are present. Where a street is being reclaimed, all stormsewer should be properly sized.

The goal of the Borough pavement management program is to maintain all roads in good to excellent condition. To accomplish this it is important to prevent the roads already in this condition from deteriorating any further. Some years it may be necessary to treat the roads in good condition while allowing the ones in fair condition to deteriorate to poor condition. The treatments for a road in fair condition with a poor base structure are often fairly similar to those for a road in poor condition; therefore there is little benefit to treating a road that has been rated as fair but has a poor base. In many situations we recommend allowing a road in fair condition with a poor base to deteriorate to poor condition before treatment. We usually do not recommend this philosophy be applied to roads with high levels of vehicular and/or truck traffic.

In addition, we would recommend that all pavement material used for paving be a Marshall Mix (i.e. ID-2, etc). These pavement types appear to be present on some Borough Streets already and have held up well for their age. We feel these pavement types will perform better than Superpave materials due to the low volume of traffic on most of the Borough's Streets.

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## PAVEMENT HISTORY

The following is a list of Streets the Borough has record of paving:

<u>Name</u>	<u>Year paved</u>
Long Lane (Breckenridge St. to Gettys St.)	Est. 1999
Seminary Avenue	Est. 2003
Elm Street	Est. 2003
Washington Street (Steinwehr Ave.to Hospital Alley)	2005
Hillcrest Plaza	2007
Locust Avenue	2007
E. Broadway (Harrisburg St. to Carlisle St.)	1998
Village Drive	Est. 2003
West Lincoln Avenue (Constitution Ave. west)	2000
South Street	2000
Culp Street (John's Avenue To Fairview Avenue)	2000

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## 5 YEAR MAINTENANCE PLAN

The five (5) year maintenance plan for streets was created under the assumption that an initial budget of \$530,000 was available. It was also assumed that \$100,000, which includes a combination of liquid fuels funds and general funds, would be allocated to street maintenance each year. The five (5) year maintenance plan schedule was developed by taking into consideration pavement ages and conditions, drainage conditions, street locations (i.e. Ward 1, 2 or 3), traffic volumes, previous treatments and the Borough's recommendations. Treatment timings were primarily influenced by the existing condition of the street. Streets that require an immediate treatment were usually those that were close to falling into a worse condition which would create a more expensive treatment if treatment was delayed. The following is a summary of the attached five year plan. It shows the streets planned for maintenance for the next five years. It is important to note that the treatments specified below are recommended based upon the existing conditions as well as locations of each route. If the treatments are delayed, a more extensive and costly treatment may become necessary.

The attached five year plan has been completed using these estimates and the year of treatment recommended. We have provided the Borough with an electronic copy of the spreadsheet to aid them with budget planning. By inserting an "x" in the year work is proposed, the spreadsheet calculates an inflationary adjustment at 3% per year and totals the pavement maintenance work to be completed in that year.

The five year plan should be updated by the end of 2014 or early 2015 so that plans can be prepared for the next five years and work completed to date can be tracked for future managers of the road network.

**2011 PLANNED MAINTENANCE**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>FIFTH STREET</u>	Crack Seal, Base repair as required	1
<u>LIBERTY STREET</u>	Crack Seal, Microsurface	1
<u>FRANKLIN STREET</u> (HIGH ST. TO CUL-DE-SAC)	Crack Seal, Base Repair, Binder Repair, Microsurface	2, 3
<u>FRANKLIN STREET</u> (BRECKENRIDGE TO HIGH ST.)	Crack Seal, Base Repair, Binder Repair, Microsurface	3
<u>WASHINGTON STREET</u> (BRECKENRIDGE TO HIGH ST.)	ALREADY BID (To be completed in Spring)	3
<u>SUNSET AVENUE</u>	Crack Seal, Microsurface,	3
<u>PARK STREET</u>	Crack Seal, Microsurface,	3
<u>LONG LANE</u> (HIGHLAND AVE. TO SUNSET)	Crack Seal, Microsurface	3

Sunset Avenue, Park Street, and Long Lane should be done together

<u>WASHINGTON STREET</u> (STEINWEHR TO HOSPITAL ALY)	Crack Seal, Microsurface	3
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The above streets are in fair, good and excellent condition with the exception of Franklin Street (Breckenridge to High Street) and Washington Street (Breckenridge to High Street). These sections of Franklin Street and Washington Street fell into the poor category. Washington Street was planned for treatment during 2010 by the Borough. Fifth and Franklin Street (High St. to cul-de-sac) require minimal treatment therefore we've recommended them to be treated in order to prevent a more extensive and costly treatment in the future. They will both need some base repair and binder repair where required along with crack sealing. We've included the portion of Franklin Street from Breckenridge to High Street to keep the treatment of Franklin Street grouped together. Sunset Avenue, Park Street, Liberty Street and the above portions of Long Lane and Washington Street are all in good to excellent condition. These streets should be sealed in order to keep them in a good to excellent condition. Additionally all the streets requiring crack sealing and microsurface have been grouped together for cost savings.

**2012 PLANNED MAINTENANCE**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>STRATTON STREET</u>	Crack Seal, Base repair Binder repair, Replace Damaged Curb	1

<u>HOWARD AVENUE</u> (PRINCE ST. TO MIDDLE ST.)	Full Depth Reclamation & 3.5" Overlay, Curb and Storm Drainage Improvements	3
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The portion of Howard Avenue from Prince Street to Middle Street was rated one of the poorest streets. This street appears to have subgrade issues and an inadequate subbase underneath the roadway. We felt that one poor street should be treated as part of the treatment plan for this year. On the attached 5 year maintenance plan, we have included \$90,000 for the reclamation of this portion of Howard Avenue. We've estimated the stormsewer and curb improvement to be \$180,000. This money should come from CDBG funds. Stratton Street requires minimal treatment therefore we've recommended it to be treated in order to prevent a more extensive and costly treatment in the future

**2013 PLANNED MAINTENANCE**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>MCMILLAN STREET</u>	Crack Seal, Base repair As required, Microsurface	3
<u>THIRD STREET</u>	Crack Seal, Base repair As required	1
<u>HOWARD AVENUE</u> (MCMILLIAN ST. TO PRINCE ST.)	Crack Seal, Microsurface	3
<u>CONSTITUTION AVENUE</u>	Crack Seal, Microsurface Base repair as required	2
<u>WEST LINCOLN AVENUE</u>	Crack Seal, Binder repair As required	2

Constitution Avenue, McMillan Street, Third Street and the above portion of Howard Avenue and West Lincoln Avenue are all in fair to good condition. These streets only require crack sealing with base/binder repair and microsurfacing where applicable. These streets should be sealed in order to keep them in a good to excellent condition. For this reason these streets were chosen for treatment. We would recommend that any extra CDBG funds be used for curb ramp improvements during this treatment year.

**2014 PLANNED MAINTENANCE**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>RAILROAD STREET</u>	Crack Seal & Microsurface	2
<u>EAST MIDDLE STREET</u>	Full Depth Reclamation & 5" Overlay & Replace Damaged Curb	1

Railroad Street was repaved around 2006. This street is in excellent shape and shows no cracking presently. It is appropriate to seal this street to keep it in excellent shape. Therefore we've recommended a crack seal and microsurface treatment. East Middle Street was rated in poor condition. We've recommended this street for treatment primarily because of its location and the traffic volume it receives. The street shows the beginning stage of base failure along with major pavement cracking. This street is a good candidate for full depth reclamation and overlay because of the large traffic volumes it receives and the size of the roadway. Reclamation will be more cost effective than a road reconstruction. We recommend that CDBG funds be used for the curb ramp improvements along East Middle Street. This work should be completed in conjunction with street reclamation. The cost shown in appendix D does not include any stormsewer improvements for East Middle Street.

**2015 PLANNED MAINTENANCE**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>LOCUST AVENUE</u>	Crack Seal & Microsurface	1
<u>SIXTH STREET</u>	Crack Seal, Base Repair & Drainage Improvements	1
<u>REYNOLDS STREET</u> (MIDDLE ST. TO BUFORD AVE.)	Full Depth Reclamation & 3.5" Overlay, Replace Damaged Curb & Drainage Improvements	3

Locust Street was repaved in 2007. This street is in excellent shape and shows no cracking presently. It is appropriate to seal this street to keep it in excellent shape. Sixth Street was rated in good condition. It will only require some base repair and crack sealing. It will also require some drainage improvements between York Street and Hanover Street, where existing stormwater is eroding the existing sub base along the edge of the street. The above portion of Reynolds Street is in poor condition. Once again we felt that one poor street should be treated as part of the treatment plan for this year. This section of street should be reclaimed and overlaid. CDBG funds should be used to replace the curb and storm sewer. The cost included in the 5 year plan is \$65,000. This only includes the street improvements and assumes that CDBG funds will be available to complete the curb and storm sewer improvements.



*Pavement Evaluations &  
Recommendations for  
Alleys*

## ALLEYS LIST

The following is a list of all the alleys that were reviewed. The entire network of alleys consists of approximately 8.43 miles. The lengths provided below are those measured by our office while performing field evaluations. Alleys adjacent to state owned roads were evaluated starting at the centerline of the intersecting street with the first station 0+00 not being used. The measured length was from the edge of the state right-of-way as indicated by a change in pavement materials. Lengths of alleys do not include intersecting roadways.

<u>Roadway</u>	<u>Length (Mi.)</u>	<u>From</u>	<u>To</u>
Ackerson Alley	0.047	Naugle Alley	Hartzell Alley
Barbehenn Alley	0.077	Water Street	Steven Street
Bickle Alley	0.187	College Avenue	Linbro Alley
Bream Alley	0.079	Spring Street	West Middle Street
Brickyard Alley	0.207	Smith Alley	College Avenue
Bush Alley	0.037	Sickles Alley	West Middle Street
Cannery Alley	0.093	Fourth Street	East Railroad Street
Cemetery Alley	0.111	Washington Street	Long Lane
Columbia Alley	0.032	Hazel Alley	Stratton Street
Court Alley	0.464	Washington Street	Legion Alley
Delap Avenue	0.112	Washington Street	Carlisle Street
Dobbin Alley	0.098	Hospital Alley	Washington Street
Dobbin Alley	0.071	Schimmelpfennig Alley	Dead End
Foth Alley	0.080	Stratton Street	Strickhouser Alley
Furniture Alley	0.156	Sixth Street	Little Alley
Gilliland Alley	0.108	Railroad Street	West Street
Hamme Alley	0.118	Hay Street	West Middle Street
Hartzell Alley	0.128	Barlow Street	Markley Alley
Hazel Alley	0.256	Barlow Street	Dead End
Hospital Alley	0.036	Washington Street	Dobbin Alley
Hudson Alley	0.229	Third Street	Sixth Street
Jacobs Alley	0.091	East Broadway Street	Dead End
Keefer Alley	0.067	Wye Alley	Hudson Alley
Kuhn Alley	0.069	Water Street	Monument Alley
Legion Alley	0.761	Reynolds Street	East Middle Street
Levan Alley	0.048	Court Alley	Patrick Alley
Linbro Alley	0.076	Lincoln Street	Broadway Street
Lincoln Lane	0.134	Washington Street	Long Lane
Little Alley	0.039	York Street	Racehorse Alley
Markley Alley	0.200	Steven Street	Broadway Street
Mayor Alley	0.050	Dobbin Alley	Court Alley
Monument Alley	0.066	Water Street	Delap Avenue
Naugle Alley	0.074	Markley Alley	Stratton Street
No name Alley	0.033	Stratton Street	Hazel Alley
Noonan Alley	0.188	Queen Street	John's Avenue
Pape Alley	0.050	Franklin Street	Warner Alley
Patrick Alley	0.075	Wall Alley	Breckenridge Street
Pfeffer Alley	0.030	Schoolhouse Alley	Baltimore Street
Plank Alley	0.075	High Street	Middle Street
Racehorse Alley	0.377	Carlisle Street	Little Alley

<u>Roadway</u>	<u>Length (Mi.)</u>	<u>From</u>	<u>To</u>
Racehorse Alley	0.336	Carlisle Street	Buford Avenue
Reaser Alley	0.040	York Street	Racehorse Alley
Roth Alley	0.112	Stratton Street	Legion Alley
Schimmelpfennig Alley	0.080	Court Alley	Washington Street
Schoolhouse Alley	0.168	Lefever Street	Wall Alley
Shealer Alley	0.042	Hamme Alley	Ridge Avenue
Sheely Alley	0.127	Markley Alley	Old Harrisburg Road
Sickles Alley	0.091	Ridge Avenue	Howard Avenue
Slentz Alley	0.037	Legion Alley	East Middle Street
Smith Alley	0.037	West Broadway Street	Brickyard Alley
Stauffer Alley	0.037	East Middle Street	Zerfing Alley
Strickhouser Alley	0.094	Foth Alley	Water Street
United Alley	0.080	Franklin Street	Washington Street
Wall Alley	0.221	Stratton Street	Washington Street
Warner Alley	0.165	Cemetery Alley	High Street
Weaver Alley	0.114	Hillcrest Plaza	Locust Avenue
Wentz Alley	0.170	Reynolds Street	Hay Street
Wolf Alley	0.170	Hay Street	Reynolds Street
Wye Alley	0.212	Hudson Alley	Sixth Street
Zerfing Alley	0.863	Sixth Street	West Street

## **MAINTENANCE, PRESERVATION, AND REHABILITATION OPTIONS**

Based upon Borough preferences and our observations, we have recommended the following treatment options depending upon alley conditions.

Alleys that are in the poorest condition are generally recommended to be improved with either one of three options. These alleys are identified on the five year plan as receiving a base replacement and 3" overlay. This description is broad to allow the Borough the option of choosing the best treatment for a given alley once the suitability of the base material is determined.

The first option under the base replacement treatment consists of a full depth reclamation of the existing pavement and base followed by the placement of a binder course and a wearing overlay. Reclamation involves pulverization of the existing pavement and subbase followed by placement of a binder course and a wearing surface course. The existing road material including the stone subbase and possibly the underlying soil is pulverized and then a bonding agent is added (as needed). The uniform mixture is placed and compacted to create a stable road base. This process minimizes waste of existing materials. Alleys identified for reclamation require a core sample to determine the thickness of each layer. These cores should be pulverized and tested with various additives, such as lime, Portland cement, or calcium chloride, to determine the best additive mix for a stable reclaimed subbase. Because reclamation will increase the pavement elevation, the Borough should determine which alleys can increase in pavement elevation without creating drainage issues. Depending on what kind of subbase is present, additional material may be required to be removed from the roadway.

The second option under the base replacement treatment consists of a complete reconstruction. This may be necessary if the existing pavement section and soils are not appropriate for reclamation. This entails excavating the existing base material and soil, if necessary, placing and compacting a stone base, followed by the application of an asphalt binder course and wearing course. This option is also appropriate for alleys where pavement elevation cannot be increased due to existing drainage conditions. If suitable soils are present then the third option should be utilized.

The third option under the base replacement treatment is to mill all the existing pavement out and place a new binder and wearing course. This option is recommended for alleys that have excessive cracking in the pavement and minor edge rutting, but no apparent subbase issues. This option is also appropriate for alleys where pavement elevation cannot be increased and where working conditions are tighter. This philosophy is also being used currently for alleys in the Borough and we feel it can be more cost effective than option 1 and 2 as long as the subbase is adequate.

Due to variations in cost for the three above options, the cost estimates prepared by C.S. Davidson, Inc. are only based on option 3 assuming the work is being completed by the public works crew using rented equipment, as has been done in the past. These costs were estimated based on previous project cost data received from the Borough. Options 1 and 2 will require more cost depending on the subbase condition. Additional cost will be required for a contractor to perform the work.

For some alleys that are in a fair/poor condition that do not appear to have subbase issues we are recommending a 1.5" mill and overlay. Some of these include Bush Alley, Columbia Alley and portions of Wall Alley. For any alley that is proposed to receive this treatment, the existing pavement thickness should be cored and reviewed. These recommendations may need to be altered based on the amount of existing pavement on these alleys. If there isn't adequate existing pavement

thickness after the milling is completed then alterations will be required or else the paving equipment could damage the thin binder course. No overlay wearing course should be placed on an inadequate binder course. Additionally, if treatment on these alleys is prolonged, a mill and overlay may not be an adequate treatment.

We recommend that alleys in good condition receive a surface treatment application. Alleys in fair condition may also fall in this category if they have a sound base, or if the base is repaired, and a good surface is present. There are many surface treatments available; however, because of the past experience the Borough has had with microsurfacing and due to the aesthetics that it provides, we are recommending microsurfacing for all alleys requiring a surface treatment.

Microsurfacing consists of a mixture of fine aggregate and asphalt emulsion. The mix is formulated for a very quick cure and traffic can typically return within one hour. Because of its quick curing ability microsurfacing can be placed thicker than other emulsion surface treatments and can be used to fill ruts and for minor re-profiling. It is not intended as a crack treatment and will not prevent cracks in underlying pavements from reflecting through to the surface. Microsurfacing has been estimated to last 6 to 8 years. The treatments life depends on the stability of the microsurfacing, the traffic levels, construction techniques, and the condition of the underlying pavement. There are a variety of different microsurfacing mix designs that should be considered based upon the existing distresses that are present.

In addition to receiving a surface treatment, some alleys in good and fair condition will require base or binder repair. Most of these repairs will occur along the edge of the cartway. If an alley is to receive a surface treatment then all base and binder repair along with crack sealing should be done prior to any surface treatment.

As alleys in the Borough are improved to good or excellent condition, a surface treatment program is necessary to maintain the roads in this condition. For alleys within the Borough, we generally recommend the continued use of microsurfacing with applications planned for every five to ten years.

Alleys in good to excellent condition that show minor signs of cracking should receive only the application of crack sealant as needed. It should be noted that routes in good condition should still receive sealant in years that they are not being treated and should not be allowed to deteriorate to a fair condition.

Drainage of water from pavements is always an important consideration when performing pavement rehabilitation. Excess water combined with traffic loads often lead to early pavement distress. Methods of treating this water generally consist of preventing the water from entering the pavement which is often addressed with crack sealing and surface treatments, and providing drainage to quickly remove excess water. Some of the alleys within the Borough have inverted crowns with inlets placed toward the center of the alley usually at intersections with streets. We feel this is a good method of draining the alleys without creating drainage conflicts with adjacent properties. This also provides some crown while a flat alley allows water to seep into the pavement structure. We feel the use of an inverted crown should be considered for all alleys receiving a base replacement treatment. Additional storm inlets may be necessary on some alleys and in some streets. This should be coordinated with any street improvements. We would also recommend the use of perforated underdrain to remove water from the subbase material. This is a cost effective method of removing excess water.

The goal of the Borough pavement management program is to maintain all alleys in good to excellent condition. To accomplish this it is important to prevent the alleys already in this condition from deteriorating any further. Some years it may be necessary to treat the alleys in good condition while allowing the ones in fair condition to deteriorate to poor condition. The treatments for an alley in fair condition with a poor base structure are often fairly similar to those for an alley in poor condition; therefore there is little benefit to treating an alley that has been rated as fair but has a poor base. In many situations, we recommend allowing an alley in fair condition with a poor base to deteriorate to poor condition before treatment.

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## PAVEMENT HISTORY

The following is a list of alleys the Borough has record of paving:

<u>Name</u>	<u>Year paved</u>
Hamme Alley	2007
Keefer Alley	2007
Hazel Alley	2007
Wentz Alley	2008
Columbia Alley	2008
Part of W. Wall Alley	2009
Naugle Alley	2009
Hartzel Alley	2009
Wye Alley (3rd to 4th St.)	2009
Hudson Alley (Wye to 4th. St.)	2009
Shealer Alley	2009
Delap Avenue	2010
W. Wall Alley, 100' East of S. Wash. To Balt. St.	2010
Warner Alley	2010
Shealer Alley	2010
Schimmelpfennig Alley	2010
Bikel Alley (100' west of Wash. To College Ave.)	2010

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## 5 YEAR MAINTENANCE PLAN

The five (5) year maintenance plan for alleys was created under the assumption that no initial budget money was available. It was also assumed that \$40,000 of general funds would be allocated to alley maintenance each year. The five (5) year maintenance plan schedule was developed by taking into consideration pavement ages and conditions, drainage conditions, alley locations (i.e. Ward 1, 2 or 3), traffic volumes, previous treatments and the Borough's recommendations. Treatment timings were primarily influenced by the existing condition of the alley pavement. Alleys that require an immediate treatment were usually those that were close to falling into a worse condition which would create a more expensive treatment if treatment was delayed.

The attached five year plan has been completed using these estimates and the year of treatment recommended. We have provided the Borough with an electronic copy of the spreadsheet to aid them with budget planning. By inserting an "x" in the year work is proposed, the spreadsheet calculates an inflationary adjustment at 3% per year and totals the pavement maintenance work to be completed in that year.

The five year plan should be updated by the end of 2014 or early 2015 so that plans can be prepared for the next five years and work completed to date can be tracked for future managers of the road network.

The following is a summary of the attached five year plan. It shows the alleys planned for maintenance for the next five years. It is important to note that the treatments specified below are recommended based upon the existing conditions as well as locations of each route. If the treatments are delayed, a more extensive and costly treatment may become necessary.

Additionally, two alleys and a portion of another were paved after the pavement condition data was collected. Schimmelpfennig Alley and an un-named alley between Columbia and Water Street were initially rated as poor. After performing field views, it was discovered that these alleys had been paved after the initial ratings were taken. Therefore these alleys are in the excellent column in the 5 year plan but were rated at a 41.3 and 56.7 respectively. A portion of Wall Alley from Washington to Baltimore Street was also repaved after the initial rating was taken. This road was originally rated in fair condition and due to the small amount of repaved area we feel this alley as a whole should be considered fair.

**2011 PLANNED MAINTENANCE (BOROUGH'S PLAN - ALREADY APPROVED)**

**Borough Staff Projects**

<u>Name</u>	<u>Planned Maintenance</u>	<u>Ward</u>
<u>WYE ALLEY</u> (SIXTH ST. TO FOURTH ST.)	Base Replacement and 3" Overlay	1
<u>LINBRO ALLEY</u>	Base Replacement and 3" Overlay	2
<u>ZERFING ALLEY</u> (SIXTH ST. TO FIFTH ST.)	Base Replacement and 3" Overlay	1
<u>ZERFING ALLEY</u> (WASH. ST. TO FRANKLIN ST.)	Base Replacement and 3" Overlay	3
<u>HUDSON ALLEY</u> (FOURTH ST. TO SIXTH ST.)	Base Replacement and 3" Overlay	1
<u>WEAVER ALLEY</u>	Base Replacement and 3" Overlay	1

**2012 PLANNED MAINTENANCE**

**Borough Staff Projects**

None

**Contracted Projects- to be bid together on PennDOT Forms**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>SCHOOLHOUSE ALLEY</u>	Crack Seal, Microsurface, Binder repair as required	1
<u>PFEFFER ALLEY</u>	Crack Seal, Microsurface	1
<u>DOBBIN ALLEY</u> (SOUTH ST. TO END)	Crack Seal, Microsurface	3
<u>MAYOR ALLEY</u>	Crack Seal, Microsurface Base repair as required	3
<u>NOONAN ALLEY</u>	Crack Seal, Microsurface	3
<u>CANNERY ALLEY</u>	Crack Seal, Microsurface, Base Repair as required	1

<u>LEGION ALLEY</u> (STRATTON ST. TO LEFEVER ST.)	Crack Seal, Microsurface Binder repair as required	3
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<u>BICKLE ALLEY</u> (4+16 TO LINBRO ALLEY)	Crack Seal, Microsurface Base repair as required	2
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The above alleys are in fair to good condition. Noonan Alley was in good condition showing some signs of weathering and has large aggregate material present on the pavement surface. It should be treated with a microsurface treatment and crack seal to bring it up to an excellent condition and seal the pavement. Cannery Alley, Dobbin Alley, Mayor Alley, Pfeffer Alley and Schoolhouse Alley and the above mentioned portions of Legion and Bickle Alley were all in fair condition. Dobbin, Mayor, and Pfeffer Alley all have large aggregate material present on the pavement surface. These five alleys should be treated with a microsurface treatment and crack seal with some localized binder and base repair to bring them up to an excellent condition. We recommend that these alleys be treated as early as possible to avoid continued deterioration which will result in pavement reconstruction and more costly repairs.

**2013 PLANNED MAINTENANCE**

**Contracted Projects- to be bid together on PennDOT Forms**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>ACKERSON ALLEY</u>	Crack Seal, Microsurface Base repair as required	1
<u>HAZEL ALLEY</u>	Crack Seal, Base repair As required	1
<u>DOBBIN ALLEY</u> (HOSPITAL ALY TO COURT ALY)	Crack Seal, Microsurface Base repair as required	3
<u>HOSPITAL ALLEY</u>	Crack Seal, Microsurface	3
<u>LITTLE ALLEY</u>	Crack Seal, Microsurface	1
<u>JACOBS ALLEY</u>	Crack Seal, Microsurface Base repair as required	1
<u>LEGION ALLEY</u> (REYNOLDS ST. TO WEST ST)	Crack Seal, Microsurface Base repair as required	3
<u>WALL ALLEY</u>	Crack Seal, Microsurface, Base repair As required, Mill And overlay 300 ft section	1,3

The above alleys are in fair condition. Hazel Alley was in a good condition showing a small area of required base repair. It should be treated with a microsurface treatment and crack seal to bring it up to an excellent condition and seal the pavement. Ackerson, Hospital, Little, Jacobs, Wall Alley and the above portions of Legion and Dobbin Alley were all in fair condition. These seven alleys should be treated with a microsurface treatment and crack seal with some localized binder and base repair to

bring them up to an excellent condition. Hazel Alley should be treated with a crack seal and base repair and is planned for a microsurface treatment in 2016 since this alley was paved in 2007.

**2014 PLANNED MAINTENANCE**

**Borough Staff Projects**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>MARKLEY ALLEY</u> Sheely Alley to East Broadway Street	Base Replacement and 3” Overlay	1
<u>BREAM ALLEY</u>	Base Replacement and 3” Overlay	2
<u>ROTH ALLEY</u>	Base Replacement and 3” Overlay	1
<u>HARTZELL ALLEY</u> (BARLOW TO STRATTON ST)	Base Replacement and 3” Overlay	1

**Contracted Projects- to be bid together on PennDOT Forms**

<u>MARKLEY ALLEY</u> (excludes Sheely to Broadway St.)	Crack Seal, Microsurface, Base repair as required	1
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Markley Alley is in fair condition, except for one section. The part from Sheely Alley to East Broadway Street was in poor condition. Some of the alley appeared to have been paved in the last 5 years. The portion of the alley from Sheely Alley to East Broadway should receive base replacement and a 3” overlay. The cost for this section was calculated assuming the Borough is performing the work. Bream, Roth Alley and portions Hartzell Alley are in poor condition and require base replacement and overlay. Bream, Roth and portions of Hartzell Alley were selected because they were rated as some of the worst roads. The focus of the 2014 treatment plan was to treat some of the worst alleys.

**2015 PLANNED MAINTENANCE**

**Borough Staff Projects**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>KUHN ALLEY</u>	Base Replacement and 3” Overlay	2
<u>SMITH ALLEY</u>	Base Replacement and 3” Overlay	2
<u>BRICKYARD ALLEY</u>	Base Replacement and 3” Overlay	2

<u>STAUFFER ALLEY</u>	Base Replacement and 3” Overlay	1
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<u>SLENTZ ALLEY</u>	Base Replacement and 3” Overlay	1
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The above alleys are in poor condition. These five alleys should be treated with a base replacement and 3” overlay. The cost estimates assume the Borough work crew is doing the work. Bream, Roth and portions of Hartzell Alley were selected because they were rated as some of the worst alleys. Additionally they were chosen because of their location. Again the focus of the 2015 treatment plan was to continue treating some of the worst alleys.

**2016 PLANNED MAINTENANCE**

**Borough Staff Projects**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>LEVAN ALLEY</u>	Base Replacement and 3” Overlay	3
<u>DOBBIN ALLEY</u> (SCHIMMELPFENNIG ALLEY TO SOUTH ST)	Base Replacement and 3” Overlay	3

**Contracted Projects- to be bid together on PennDOT Forms**

<u>Name</u>	<u>Recommendation</u>	<u>Ward</u>
<u>HAMME ALLEY</u>	Crack Seal, Microsurface	3
<u>HAZEL ALLEY</u>	Crack Seal, Microsurface	1
<u>WENTZ ALLEY</u>	Crack Seal, Microsurface	2
<u>KEEFER ALLEY</u>	Crack Seal, Microsurface Base repair as required	1
<u>STRICKHOUSER ALLEY</u>	Crack Seal, Microsurface	1
<u>PLANK ALLEY</u>	Crack Seal, Microsurface	3
<u>ZERFING ALLEY</u> (FRANKLIN TO WEST STREET)	Crack Seal, Microsurface	3

Because the Borough has a budgeted plan for 2011, we have added additional maintenance for 2016. Levan and portions of Dobbin Alley are in poor condition. They should be treated with a base replacement and 3” overlay. The cost estimates assume the Borough work crew is doing the work. After selecting alleys to be microsurfaced, money was left in the budget; therefore these two were

chosen to receive treatment because of their small size. The above contracted alleys including Hamme, Hazel, Wentz, Keefer, Strickhouser, Plank and portions of Zerfing Alley should receive a crack seal and microsurface treatment. These alleys were all paved between 2005 and 2008 and will require a microsurface treatment by 2016.

In cases where there is money left in the budget from the previous year's alley projects, we would recommend that additional alleys be treated. For alleys receiving a microsurface treatment in 2012 and 2013, it is important that these alleys be treated as soon as possible. The longer the treatment is prolonged, the more costly the repair will be. If possible, we would recommend that all base and binder repair be performed at the same time by one contractor. This will be more cost effective. Additionally, if possible, all alleys scheduled for microsurfacing should be treated at the same time by one contractor or the same contractor completing the base and binder repair. This will ultimately allow for better prices and make the contracting easier.

Alley	TREATMENT	2010 COST	2011	2012	2013	2014	2015	2016	Ward
	Starting Balance = \$0.00								
	Annual Budget = \$40,000.00								
	Excellent Condition(0%)								
Bickle Alley (College Avenue to 4+16)	Crack Seal (By Borough) as needed	\$0							2
Delap Avenue	Crack Seal (By Borough) as needed	\$0							2
Hammie Alley	Crack Seal & Microsurface	\$3,980						X \$4,613	3
Warner Alley	Crack Seal (By Borough) as needed	\$0							3
Schimmelpfennig Alley (paved after CSD Survey)	Crack Seal (By Borough) as needed	\$0							3
Wente Alley	Crack Seal & Microsurface	\$4,655						X \$5,396	2
Keefe Alley	Crack Seal, Stone Base Repair & Microsurface	\$2,531						X \$2,934	1
Strickhouser Alley	Crack Seal & Microsurface	\$2,770						X \$3,211	1
Wyle Alley (Fourth Street to Hudson Alley)	Crack Seal (By Borough) as needed	\$0							2
Gilliland Aly (Railroad Street to Delap Avenue)	Crack Seal (By Borough) as needed	\$0							1
Hudson Alley (Third Street to Fourth Street)	Crack Seal (By Borough) as needed	\$0							1
	Allotted Budget		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	
	Budget \$ Spent		\$0	\$0.00	\$0.00	\$0.00	\$0.00	\$16,154.63	
	Remaining Budget		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	-\$16,154.63	
	Good Condition/Fair Condition (40%)								
Shearer Alley	Crack Seal (By Borough) as needed	\$0							3
Naugle Alley	Crack Seal (By Borough) as needed	\$0							1
Hartzell Alley (Stratton Street to Markley Alley)	Crack Seal (By Borough) as needed	\$0							1
Court Alley (Wall Alley to Legion Alley)	Crack Seal (As necessary)	\$0							3
Zerfing Alley (Franklin Street to West Street)	Crack Seal & Microsurface	\$3,825						X \$4,435	3
Plank Alley	Crack Seal & Microsurface	\$2,061						X \$2,389	3
Hazel Alley	Crack Seal, Stone Base Repair	\$1,956			X \$2,138				1
Hazell Alley	Microsurface	\$7,850						X \$9,100	
Noonan Alley	Crack Seal & Microsurface	\$4,763		X \$5,053					3
Little Alley	Crack Seal & Microsurface	\$1,067			X \$1,166				1
Hospital Alley	Crack Seal & Microsurface	\$1,858			X \$2,031				3
Jacobs Alley	Crack Seal, Stone Base Repair, Microsurface	\$3,699			X \$4,042				1
Dobbin Alley (South Street to Hospital Building)	Crack Seal & Microsurface	\$2,087		X \$2,214					3
Bickle Alley (4+16 to Linbro Alley)	Crack Seal, Stone Base Repair, Microsurface	\$3,562		X \$4,204					2
Columbia Alley	Mill and 1.5" Overlay	\$3,284							1
Wolf Alley	Crack Seal, Stone Base Repair and Microsurface, Mill and overlay 300 ft section	\$12,873			X \$14,067				1,3
Markley Alley	Crack Seal, Stone Base Repair, Microsurface, Base Replacement and 3" Overlay	\$11,404				X \$12,835			1
Lincoln Lane (curb at Cemetery to Long Lane)	Base Replacement and 3" Overlay	\$9,246							3
Lincoln Lane (Washington Street to curb at Cemetery)	Crack Seal, As Necessary	\$0							3
Mayor Alley	Crack Seal, Spot Stone Base Repair, Microsurface	\$3,460		X \$3,671					3
Wye Alley (Sixth Street to Fourth Street)	Base Replacement and 3" Overlay	\$10,933	X \$10,933						1
Schoolhouse Alley	Crack Seal & Microsurface, Binder Repair	\$10,504		X \$11,143					1
Reaser Alley	Base Replacement and 3" Overlay	\$2,939							1
Legion Alley (Reynolds Street to West Street)	Crack Seal, Stone Base Repair, Microsurface	\$4,344			X \$4,747				3
Wolf Alley	Base Replacement and 3" Overlay	\$15,180							2
	Allotted Budget		\$16,000.00	\$21,067.00	\$10,781.96	-\$1,407.53	\$1,757.19	\$17,757.19	
	Budget \$ Spent		\$10,933	\$26,285	\$28,189	\$12,835	\$0	\$15,924	
	Remaining Budget		\$5,067.00	-\$5,218.04	-\$17,407.53	-\$14,242.81	\$1,757.19	\$1,833.20	
	Poor Condition (60%)								
Cemetery Alley	Base Replacement and 3" Overlay	\$8,446							3
United Alley	Base Replacement and 3" Overlay, Invert Crown	\$11,500							3
Ackerson Alley	Crack Seal, Stone Base Repair & Microsurface	\$3,847			X \$4,203				1
Hartzell Alley (Barlow Street to Stratton Street)	Base Replacement and 3" Overlay	\$5,451				X \$6,135			1
Kuhn Alley	Base Replacement and 3" Overlay	\$6,665					X \$7,727		2
Dobbin Alley (Hospital Alley to Court Alley)	Stone Base Repair & Microsurface	\$3,864			X \$4,222				3
Foeh Alley	Base Replacement and 3" Overlay	\$7,756							1
No name Alley (paved after CSD Survey)	Crack Seal (By Borough) as needed	\$0							1
Cannery Alley	Stone Base Repair and Microsurface	\$6,095		X \$6,403					1
Levan Alley	Base Replacement and 3" Overlay	\$3,933						X \$4,559	3
Pfeffer Alley	Crack Seal & Microsurface	\$822		X \$872					1
Racehorse Alley (Little Alley to Carlisle Street)	Crack Seal, Stone Base Repair & Microsurface	\$44,142							1
Barbarn Alley	Stone Base Repair, Mill and Overlay 50%, Microsurface 50%	\$9,371							1
Court Alley (Washington Street to Mayor Alley)	Crack Seal & Stone Base Repair, Microsurface	\$26,089							3
Legion Alley (West Street to Stratton Street)	Full Depth Reclamation and 3" Overlay	\$0							3
Linbro Alley	Base Replacement and 3" Overlay, Invert Crown	\$32,292							1,3
Patrick Alley	Base Replacement and 3" Overlay, Invert Crown	\$6,794	X \$6,794						2
Gilliland Alley (Delap Avenue to Water Street)	Base Replacement and 3" Overlay	\$11,279							3
Zerfing Alley (Sixth Street to Fifth Street)	Base Replacement and 3" Overlay	\$6,803							2
Zerfing Alley (Fifth Street to Washington Street)	Base Replacement and 3" Overlay	\$7,813	X \$7,813						1
Zerfing Alley (Washington Street to Franklin Street)	Base Repair, Binder Repair, Crack Seal, Microsurface	\$66,627							1,2
Hudson Alley (Fourth Street to Sixth Street)	Base Replacement and 3" Overlay	\$7,334	X \$7,334						1
Sickles Alley	Base Replacement and 3" Overlay	\$6,073	X \$6,073						3
Weaver Alley	Crack Seal & Binder Repair	\$5,339							3
Stauffer Alley	Base Replacement and 3" Overlay	\$4,453	X \$4,453						1
Sheely Alley	Base Replacement and 3" Overlay	\$3,008					X \$3,488		1
Bush Alley	Base Replacement and 3" Overlay	\$10,378							1
	Mill and Overlay 1.5", Drainage Improvement	\$6,722							3
Racehorse Alley (Carlisle Street to Bufford Avenue)	Binder Repair, Crack Seal, Microsurface, Base replacement and 3" Overlay from Franklin St. to Bridge toward Bufford Ave.	\$46,305							2
Dobbin Alley (Schimmelpfennig Alley to South Street)	Base Replacement and 3" Overlay	\$2,553						X \$2,960	3
Legion Alley (Stratton Street to Lefever Street)	Crack Seal, Binder Repair & Microsurface	\$5,579		X \$5,919					1
Legion Alley (Lefever Street to Middle Street)	Base Replacement and 3" Overlay	\$11,661							1
Slents Alley	Base Replacement and 3" Overlay	\$2,691					X \$3,120		1
Pape Alley	Base Replacement and 3" Overlay	\$11,449							3
Smith Alley	Base Replacement and 3" Overlay	\$9,312							2
Monument Alley	Base Replacement and 3" Overlay	\$4,802					X \$3,840		2
Brickyard Alley	Base Replacement and 3" Overlay	\$20,093					X \$23,293		2
Furniture Alley	Base Replacement and 3" Overlay	\$13,386							1
Bream Alley	Base Replacement and 3" Overlay	\$8,308					X \$9,350		2
Roth Alley	Base Replacement and 3" Overlay	\$9,936				X \$11,183			1
	Allotted Budget		\$24,000.00	\$15,593.00	\$26,398.93	\$41,973.19	\$39,304.71	\$21,887.94	
	Budget \$ Spent		\$32,407	\$13,194	\$8,426	\$26,668	\$41,467	\$7,519	
	Remaining Budget		-\$8,407.00	\$2,398.93	\$17,973.19	\$15,304.71	-\$2,162.06	\$14,318.88	
	Total Budget		\$40,000.00	\$36,660.00	\$37,180.89	\$40,565.65	\$41,061.90	\$39,595.13	
	Budget \$ Spent		\$43,340.00	\$39,479.11	\$36,615.23	\$39,503.76	\$41,466.77	\$39,597.67	
	Remaining Budget		-\$3,340.00	-\$2,819.11	\$565.65	\$1,061.90	-\$404.87	-\$2.54	
General Notes: Sections of alleys for pavement treatments don't necessarily correspond to exact sections which surface condition ratings were determined from									
(1) Assumes Borough work crew is completing work with rented equipment and hauling material away, additionally cost will be incurred for reclamation of the alley									
(2) Cost is based on provided cost estimate from Borough									