

CITY OF BIRMINGHAM
AD HOC UNIMPROVED STREETS
COMMITTEE
CITY COMMISSION ROOM
151 MARTIN ST., BIRMINGHAM, MI
(248) 530-1850
REGULAR MEETING AGENDA
THURSDAY, AUGUST 22, 2019, 8:00 A.M.

1. ROLL CALL
2. APPROVAL OF MAY 16, 2019 MEETING MINUTES
3. ROAD DESIGN OPTIONS: PRESENTATION
4. INITIAL DRAFT RECOMMENDATIONS FOR COMMITTEE CONSIDERATION: DISCUSSION
5. PUBLIC COMMENT
6. NEXT MEETING: TBD
7. ADJOURN

Persons with disabilities that may require assistance for effective participation in this public meeting should contact the City Clerk's Office at the number (248) 530-1880, or (248) 644-5115 (for the hearing impaired) at least one day before the meeting to request help in mobility, visual, hearing, or other assistance.

Las personas con incapacidad que requieren algún tipo de ayuda para la participación en esta sesión pública deben ponerse en contacto con la oficina del escribano de la ciudad en el número (248) 530-1800 o al (248) 644-5115 (para las personas con incapacidad auditiva) por lo menos un día antes de la reunión para solicitar ayuda a la movilidad, visual, auditiva, o de otras asistencias. (Title VI of the Civil Rights Act of 1964).

City Of Birmingham

AD HOC UNIMPROVED STREET STUDY COMMITTEE

Birmingham City Hall Commission Room
151 Martin, Birmingham, Michigan
Thursday, May 16, 2019

Minutes of the Ad Hoc Unimproved Street Study Committee meeting held Thursday, May 16, 2019. Chairman Scott Moore called the meeting to order at 8:00 a.m.

1) ROLLCALL

Present: Chairman Scott Moore
Jason Emerine
Katie Schafer
Stuart Sherman
Janelle Whipple-Boyce

Absent: Pierre Boutros, Michael Fenberg

Administration: Tiffany Gunter, Assistant City Manager
Paul O'Meara, City Engineer
Mark Gerber, Finance Director
Austin Fletcher, Asst. City Engineer
Laura Eichenhorn, Transcriptionist
Aaron Filipski, Public Services Manager

2) APPROVAL OF APRIL 18, 2019 MEETING MINUTES

Motion by Ms. Whipple-Boyce

Seconded by Mr. Emerine to approve the Minutes of the Ad Hoc Unimproved Streets Committee of April 18, 2019 as submitted.

VOICE VOTE

Yeas: Whipple-Boyce, Emerine, Schafer, Sherman, Moore

Nays: None

3) RECOMMENDATION: ENGINEERING CONSULTANT ENGAGEMENT – PEER REVIEW AND TRADE-OFF ANALYSIS: ROAD DESIGN ALTERNATIVES

Assistant City Manager Gunter presented the item.

ACM Gunter explained an engineering consultant will help provide Birmingham with information about regional trends and options for its future road design.

Mr. Emerine told the Committee that he owns an engineering firm and that the quoted costs for the item are reasonable.

Motion by Mr. Sherman

Seconded by Mr. Emerine to request that the City Commission authorize engagement with an outside Engineering firm, for a cost not to exceed \$7,000, to conduct research and information gathering and provide a final report to the committee regarding road design alternatives for converting unimproved roads.

VOICE VOTE

Yeas: Sherman, Emerine, Whipple-Boyce, Schafer, Moore

Nays: None

4) MEETING OPEN FOR MATTERS NOT ON THE AGENDA

Mr. Emerine noted he had been to six or seven different Master Plan meetings and that unimproved streets were brought up at every single meeting.

Chairman Moore echoed Mr. Emerine's observation that Birmingham residents desire improved streets and that it is seen as a quality of life issue.

Dr. Schafer said unimproved streets are often unsafe and are especially so during periods of inclement weather which can further erode the streets.

Malcolm Hendy spoke as a resident of Northlawn, explaining that people drive 50 to 60 mile per hour down Northlawn to get between Telegraph and Southfield Road. He said the high speeds have done even more damage to their unimproved street, and that the residents of Northlawn to the west of Southfield Road would like their street improved. In addition, Mr. Hendy acknowledged the likelihood that an improved Northlawn could lead to even further speed increases. As a result, Northlawn residents have come up with a list of recommendations that could temper speeding on the street, and will be making those recommendations to the City.

Chairman Moore confirmed that these are the exact concerns that led to the existence of this Committee. He said the City will likely be changing the process through which residents can apply to have their streets improved, and will also likely have a ranking system to determine which streets are in most dire need of improvement first.

5) NEXT MEETING: THURSDAY, JULY 18, 2019 AT 8 AM

6) ADJOURNMENT

No further business being evident, the Committee motioned to adjourn the meeting at 8:25 a.m.

Ad Hoc Unimproved Street Study Committee
Minutes of May 16, 2019

City Engineer Paul O'Meara

Assistant City Manager Tiffany Gunter



MEMORANDUM

Office of the City Manager

DATE: August 22, 2019

TO: Ad Hoc Unimproved Streets Study Committee

FROM: Tiffany J. Gunter, Assistant City Manager
Paul O'Meara, City Engineer
Mark Gerber, Finance Director
Aaron Filipski, Public Service Manager

SUBJECT: Road Design Options Report and Initial Draft Recommendation for Committee Consideration

The purpose of the Ad Hoc Unimproved Street Study Committee is to conduct a city-wide study of unimproved streets and provide a recommendation to the City Commission outlining a long term plan for these streets. The first meeting of the Ad Hoc Unimproved Streets Committee was held June 2018. Since that time, the Committee has worked to develop a common understanding of 1) the history of unimproved roads in the City, 2) the City Charter and ordinance as they relate to unimproved streets, 3) special assessment districts, 4) pavement types and their associated life cycles, 5) the cape seal program, and 6) road funding fundamentals.

At the April 18, 2019 meeting of the Ad Hoc Unimproved Streets Committee, a staff presentation was made in response to the committee's request to explore potential funding scenarios as they began the process of considering alternatives for recommendation. The presentation was heard by the committee and it was understood that there would be a need for on-going discussion and further iterations of model inputs and subsequent outputs. It was agreed that further study of the universe of road design alternatives may ultimately result in either a shorter timeframe for completion and/or reduced overall cost.

As staff began working internally to establish revised assumptions to adjust the model, it was suggested that a more in-depth peer review of our neighboring communities and their experiences with improving streets would provide better data to support any adjustments to the model. Staff recommended that engaging an outside engineering firm to provide a broader perspective regarding the range of possible road design alternatives would enhance the quality of a future recommendation.

The decision of the committee regarding road design will provide critically important input to support any further iterations of model output. Staff requested that the committee consider a recommendation to authorize an engineering firm to conduct the necessary research and information gathering and present a findings summary to the committee.

An Engineering Report completed by OHM, dated August 14, 2019, is included as an attachment to this memo. Staff has had the opportunity to review the findings of OHM report and have taken that information together with the common themes and discussions that have been held at the

committee level to draft and initial recommendation for consideration and discussion. It is important to note that staff did not draft the policy as a proposed recommendation for action. Rather, it was written in an attempt to interpret what the minutes of previous meetings indicated may be the direction of the committee. It is intended to be viewed as a baseline tool to enhance dialogue among committee members. The following paragraphs provide an overview of the three main issues that you've indicated should be addressed in any final recommendation to the City Commission for consideration. Those issues are 1) initiation of the petition process, 2) road surface/design alternatives and 3) funding to support a program of converting unimproved roads.

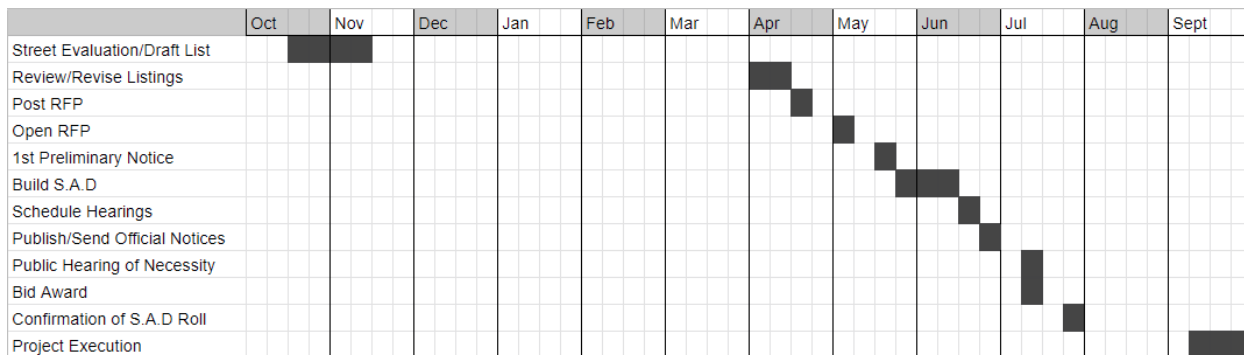
1) Initiation of the Petition Process

The current process for initiating a petition has historically begun when residents become dissatisfied relative to the condition of their street pavement often know little about why their street is in the condition it is. Frequent problems can include rough riding surface or drainage problems. A telephone call to City Hall will be directed to the Engineering Dept., where an explanation of the City's policies begins. Staff explains that a special assessment district must be created in order to raise the funds to pay for such a project. The City Commission has not been inclined to create such a district unless it has clear indication that the majority of property owners agree with the idea. In order to start the process, a petition needs to be created that demonstrates that a majority of the property owners are in favor. Staff offers to email a blank petition form prepared for the specific street being discussed, and also tries to provide the resident with the basic information needed in order to start conversations with neighbors about the idea. It is the responsibility of the neighbors to obtain a majority of signatures from homeowners in favor of improving the road before any official action can be considered by the City Commission.

The committee has discussed the difficulties associated with having homeowner's initiate a petition process to have their road improved. It has caused disputes and frustration and as a result, homeowners are less likely to initiate the process. The Committee has asked staff to explore the possibility of a City initiated process.

As you know, the City has routinely evaluated and prioritized streets as part of the on-going maintenance cycle for cape sealing to ensure that they are adequately maintained. The preparation of a cape seal maintenance project is significantly more involved than other types of contracted maintenance because it involves the creation of a special assessment district (SAD) for which there are statutory public hearings and notification requirements and other tasks that prolong the planning process. The required public hearings include a) the confirmation of necessity, at which the Department of Public Services presents the commission with the need for the proposed project and provides an opportunity for residents to provide input, and b) the confirmation of the assessment roll, which formally commits the subject properties to the special assessment.

The process is outlined in the chart below:



As the chart illustrates, cape seal project planning begins in late fall and involves assessing existing surface conditions on unimproved streets, resulting in a preliminary listing of potential candidate streets for future projects. Because seasonal weather can have a significant impact on street conditions, the Department of Public Services re-reviews the listings in the spring and makes revisions if necessary before publishing a request for proposals.

Subsequent to bid opening, the department is able to refine cost estimates, which are required for both the official publication of hearing notices and for the development of the special assessment district. At this stage, the department sends preliminary notices to properties subject to the cape seal project, including information on how to proceed with an improvement petition in lieu of cape seal (See Appendix A).

Feedback provided to and by the committee noted that the petition circulation process can be onerous, often requiring significant time investment on the part of petition circulators. The approximate six-week window between preliminary notification and the public hearing of necessity was intended to provide ample time for such work.

It is important to note that the sequence of steps illustrated above is not arbitrary. For example, the bid award must necessarily occur in July, as funds budgeted for the project cannot be authorized for use until the fiscal year in which they will be used. Additionally, the scope of any cape seal project cannot be accurately determined until the completion of the budget process which typically concludes in May. Thus, the ability to significantly change the sequence of steps in order to allow for additional time to circulate petitions is limited.

Interestingly, as a result of this routine process taking place over the past several months, two new street paving project discussions have been started. Please refer to Appendix B for more details. Obviously, when a street is nominated for cape sealing by the Dept. of Public Services, it is near the end of its current service life, and the need for maintenance of some sort is great. Owners with properties on such streets may be more inclined to support not only a cape sealing project, but perhaps a more substantial permanent paving project as well. Based on the discussions of the past several months, a two-step initiation process is presented below for committee consideration:

Step 1 – Continue Maintenance Program for Cape Seal Process

Similar to today, a cape sealing program could be initiated by the Dept. of Public Services using the same procedures and decision-making tools that are used today, as outlined above. The list could be defined well in advance of the intended date to hold the public hearing of necessity.

Step 2 – Select Streets for Permanent Improvement from the Cape Seal Nomination List

At the Ad Hoc Unimproved Street Study Committee meeting of September 27, 2018, an “Infrastructure Ranking” methodology was presented for discussion. The method considered the existing conditions of the water and sewer systems, as well as the current condition of the pavement. In this two-step process, the current condition of the pavement could be removed, since all the streets that were nominated for cape sealing would be presumed to have a poor surface condition. A table depicting the current condition of the water and sewer system for each of the streets nominated could be developed, with those at the top then being considered for potential nomination to a paving project status. The decision to nominate a street or streets would depend on the impact to the budget. All final decisions to move a street up to full improvement status would be made by the City Commission. Once authorized, the Engineering Dept. would then be responsible for preparing an informational booklet that would fully inform owners of the proposal, and the need to schedule a public hearing. It is recommended that the hearing be held in advance of the cape seal hearing, in the event the City Commission ultimately elects to not proceed to paving, at which time the street(s) could then be added to the cape seal list.

2) Road Surface / Design Alternatives

The practice of the City has been to engineer new roads with concrete. The OHM report supports this approach as a best practice. However, we understand that concrete is the most expensive alternative to pursue initially and the savings are found in lower maintenance costs over the years. The Committee has asked staff to explore if there are other paving options that could potentially lower the costs to homeowners. The recommended policy, ideally, would begin with the best practice of building the road with concrete material. With the exception of connector streets and streets that carry higher volumes of traffic (threshold to be defined), additional paving alternatives, such as asphalt with concrete curbs, could be allowed for the residents to consider. Page 6 of the findings report illustrates several road paving options and their associated costs to build and maintain.

The following options are intended to support the committee if there is a desire to allow some flexibility in the paving options, which will likely reduce the costs and may increase interest in residents desire to move forward with the road improvement project.

The following table, taken from the OHM report summarizes the design life, initial construction cost, and anticipated maintenance cost for several local road paving options:

Type	Design Life	Initial Cost ¹	Avg. Maint ²
6" Concrete w/curb	30-40 years	\$380/foot	\$2.25/ft/year
7" Concrete w/curb	30-40 years	\$400/foot	\$2.25/ft/year
* 7" Concrete w/curb & 8" drainage layer	40+ years	\$450/foot	\$1.75/ft/year
3" Asphalt on 8" aggregate w/concrete curb	15-20 years	\$325/foot	\$5.00/ft/year
* 4" Asphalt on 8" aggregate w/concrete curb	15-20 years	\$340/foot	\$4.50/ft/year

¹Initial construction cost including administration, sidewalk, driveways, utilities, etc.

²Anticipated total maintenance costs over the life divided by life to determine average.

Should the City Commission nominate a street for paving for which no petition was received, it may prove beneficial to provide owners with the ability to help make the final decision of what materials would be used to pave the street. In some areas, concrete may be a preferred alternative, where in other areas, a majority of owners may prefer the look of asphalt.

Of the options listed in the table above, the OHM report indicated that typically 4" asphalt or 7" concrete pavement sections are utilized for local road paving throughout the region. They recommended that the asphalt section include at least 8" of aggregate base, concrete curb and gutter, and underdrains. The following are three potential alternatives that are consistent with committee discussions, to date.

- A) The City could consider the two options that are asterisked in the table above with concrete being the preferred option and an alternate lower cost asphalt option to improve the remaining unimproved streets throughout the City. The cost share would remain the same with the City paying 15% of the total.
- B) The second possible alternative would allow for the different pavement types, but to encourage, greater adoption of the concrete alternative, the City would increase the funding participation greater than 15% recognizing the costs for average maintenance would be lower over time. This alternative, depending on the funding mechanism recommended by the committee could impact the total length of roadway that may be completed within a certain timeframe.
- C) Finally, knowing that the City must fund all maintenance of the new street into the future, and knowing that financially a concrete street will prove to be less of a burden to the street fund over time, the City can provide further financial incentive to encourage concrete. For example, assuming the project is going to proceed, property owners can be given the opportunity to decide on the type of material used. The City could offer to subsidize the concrete option to a greater extent than the asphalt option, set at a rate such that the final assessment charged to the owners is approximately the same no matter what choice is made. Therefore, the decision of the owners would be based on aesthetics and personal preference only, not based on financial impact.

These alternatives could only be applied where existing conditions were met on residential streets (e.g., traffic volume, speed, access to major thoroughfares, classification, etc.). These thresholds would have to be discussed with the committee for any alternative that would allow for a pavement type other than concrete.

Funding

Reconstructing an unimproved street involves not only the road itself, but installation of new water mains and sanitary/storm drains. Therefore, funding for improving the streets must be examined in the context of how it will affect the general, local street, water, and sewer funds. It is estimated that the cost of reconstructing all the unimproved streets in the City would be in excess of \$100 million. In previous meetings with the committee, it was demonstrated that the City's current financial funding model could not support the reconstructing of unimproved streets at a pace that the committee would prefer while still providing the needed maintenance and replacement of improved roads already in existence and maintaining fund balance levels to support the City's AAA bond rating.

Alternative methods for funding unimproved streets were examined. This included a road millage, grants, bonding, a Headlee override and increases in user charges (water and sewer rates). A road millage is not possible as the City has maxed out the number of mills it can levy under state law. Grants are not available for neighborhood street projects as the grants are given to high traffic demand streets. Bonding is a viable method for funding these kind of projects. Bonding can be financed through special assessments, property taxes, and/or user charges (water and sewer portions of the project). A Headlee override to the City's millage rate could act like a road millage where a portion of the City's millage rate could be dedicated to provide funding for unimproved streets. This would require approval by the public in an election. Increases in water and sewer rates could fund the portion of the projects related to water and sewer. Funding for water and sewer projects (whether from property taxes or rates) historically has been spread to all the taxpayers/rate payers and not to specific properties.

Based on prior committee discussions, it appeared that one possible approach to fund these projects would be through bonding. However, what still needs to be addressed is the design of the program. To what extent would the City bond for the project? For example, would it be just the street component or would it include water and sewer as well? How would the bond be financed (special assessment, water and sewer rates, property taxes)? What would be the term of the financing (10 years is the maximum allowed under the City's ordinance for special assessment)? How much should the City bond for and how often (generally with bond financing you want to complete the project within 2 to 3 years).

The other approach to finance these projects is to continue the way they are currently being addressed. Future projects are put into the City's 6-year capital improvement schedule along with other projects and are completed when resources are available. It will take a considerable amount of time before all of the unimproved streets in the City are addressed if the pay-as-you-go option is recommended by the Committee.

The alternatives presented above are intended to represent the conversations that have been had by the committee over the past year. A few questions for the committee to consider are as follows:

- 1) Is the focus on the three issues to be addressed regarding the initiation process, road design, and funding correct?
- 2) If not, what is missing?
- 3) If so, for each category, what options would the committee like to either a) remove from consideration, b) accept or c) explore further.
- 4) Are there other hybrid alternatives that have not been contemplated that the committee would like for staff to include (for each category)?

APPENDIX A
CAPE SEAL PROCESS LETTER



Department of Public Services

851 S. Eton | Birmingham, MI | 48009

Dear Property Owner,

As part of its ongoing street maintenance program, the Department of Public Services regularly reviews the city's unimproved roadways and coordinates routine cape seal treatment. Your street has been identified for inclusion in a maintenance program tentatively scheduled to begin in the summer of 2018 (see attached map). This will include a special assessment based on property frontage.

For those unfamiliar with the process, this letter seeks to explain what cape seal is, how and why it is assessed to property owners, and, importantly, what alternative options exist.

What is an 'unimproved' road?

An unimproved road is a gravel road, with or without curbs, that has been maintained with chip or cape seal to provide a relatively smooth and dust-free driving surface.

Why does Birmingham have so many unimproved streets?

Prior to 1930, when the majority of Birmingham's neighborhoods were subdivided and opened for development, local streets were built as gravel roads with little if any provision for storm drainage. Streets were constructed with engineered pavement and drainage only when a majority of residents petitioned the City for such an improvement, the costs of which were then paid for through a special assessment on adjacent properties.

Beginning in the late 1940s, all remaining gravel roads were chip sealed, and thereafter all subsequent maintenance treatments have been assessed to property owners.

What is cape seal treatment?

Cape seal is a two-stage roadway surface treatment that provides unimproved roads with a moisture-resistant seal and a smoother driving surface. The process involves rolling stone chips into a layer of asphalt, followed several days later by an application of a slurry micro-surface. Cape seal is not a permanent solution; average life expectancy is less than 10 years.

What is the maintenance cost?

Since 1948, the City policy for assessing street maintenance work on unimproved streets is conducted in accordance with the following:

- Eighty-five percent of the front-foot costs for improvement are assessed on all property fronting on the improvement.
- Twenty-five percent of the side-foot costs for improvement are assessed on all residential property siding on the improvement.
- Eighty-five percent of the side-foot costs for improvement are assessed on improved business property siding on the improvement.
- Twenty-five percent of side-foot costs for improvement are assessed on vacant business property siding on the improvement.

The balance of the cost, 15% and 75%, front footage and side footage respectively, is paid by the City.

For the most current project, estimated per-foot costs for each property range from \$13.25 - \$21.83, and vary depending on street dimensions and the required preparation materials. These estimates include the

costs associated with a federal requirement to upgrade crosswalk ramps in the project areas to new ADA standards. Assessments for cape seal are billed as a one-time installment.

What are the limitations of cape seal maintenance?

Unimproved streets are not engineered roadways. Engineered, or improved roads are professionally designed by engineering firms to include proper drainage, grade, base construction, and other structural considerations. Because cape seal is only a surface treatment on unimproved roads, longevity cannot be guaranteed and the streets remain subject to weather- and traffic-related wear. Issues related to standing water, drainage, grade, and profile cannot be remedied through cape seal maintenance.

It is important to remember that cape seal is not a fix-all. Bumps and dips (with the exception of potholes) are likely to remain after the project. Further, in some cases, new issues can arise as a result of the treatment. Additionally, as long as a street remains 'unimproved', residents can expect periodic maintenance assessments.

What if we want to install a better, more permanent pavement at this time?

The Engineering Department has an established process that begins with a petition request presented by interested property owners. If sufficient interest is demonstrated, staff will host an informational meeting with residents to answer questions and address concerns. If support remains, the proposed project will be subject to formal public hearings to determine necessity and to establish the special assessment tax roll.

The cost of installing a permanent pavement is substantially more than cape seal maintenance. As a result, such projects are only initiated after a petition has been received indicating that over half of the owners on a street are in favor.

Because the process of obtaining support from neighbors for a permanent improvement can be time consuming, interested property owners should initiate the petition process before the formal public hearing of necessity. Streets preliminarily identified for inclusion in any cape seal maintenance project can be removed from consideration with sufficient notice and support.

What are the cost differences between cape seal maintenance and a full improvement?

Assessment estimates for the most recent cape seal maintenance project averaged \$15.26/ft. and can be expected every 7-10 years as part of the ongoing maintenance cycle. By comparison, the 2016 Villa Avenue paving project cost homeowners \$165.86 per linear foot, plus an additional \$8.44/ft² for driveway approach removal and replacement. The one-time assessments for improved roads are payable over ten years (subject to interest), and subsequent maintenance costs are covered by the City.

What are the benefits of an improved road?

In addition to providing a smoother, cleaner, more durable, and properly draining roadway, residents living on improved streets enjoy the benefit of street-side leaf pickup during the months of October and November. More importantly, all subsequent maintenance costs including patching, crack sealing, and, eventually, resurfacing or complete reconstruction, are the responsibility of the City.

Who can I contact with additional questions?

For specific questions regarding the upcoming cape seal project contact Aaron Filipski, Public Services Manager, at 248.530.1701 or afilipski@bhamgov.org.

To obtain an improved street petition form, or for questions related to street improvement options, contact the Engineering Department at 248.530.1840. Additional resources and information are available at www.bhamgov.org/streets.

APPENDIX B

2019 CAPE SEAL SELECTION PROCESS

Due to the need, the City has initiated the cape sealing process on several miles of unimproved streets over the past three years. Like previous years, the selection of the streets that were nominated was the result of a comprehensive process conducted by Dept. of Public Services staff. A map of the streets that were selected for 2019 follows. Interestingly, out of the nine streets that were selected, residents from four of them began discussions with the Engineering Dept. about getting their street paved. Petitions were prepared for all four, and distributed upon request. Two of those four appear to have a high likelihood of becoming new paving projects, as described below:

Lakeview Ave. – Oak St. to Harmon Ave.

A petition representing just over 50% of the owners on the above two blocks requesting new pavement was received by the Engineering Dept. in the fall of 2016. An informational booklet was prepared and mailed, and an informational meeting was held. Discussions among the residents ensued, and eventually some of those in support removed their name from the petition, making it fall below a majority. A public hearing was never scheduled.

When Lakeview Ave. was nominated for cape sealing this spring, a small number of residents began exploring the option of submitting a new petition, in time to avoid the cape seal process. A new petition showing 53% support was submitted in June, in advance of the cape seal public hearing. It was removed from the list, a new updated booklet was mailed to all owners, and a second neighborhood meeting was held on July 16. The tone of the meeting was more positive, and the petition remained at 53% support through this process. A public hearing of necessity before the City Commission has been scheduled for the meeting of September 16, 2019.

The most recent booklet and meeting invitation for this street has been attached for your reference.

Wimbledon Dr. – Woodward Ave. to Adams Rd.

At the cape seal public hearing, a total of six different owners representing Wimbledon Dr. spoke, each making the suggestion that they would like to hold off on the cape sealing process to allow the residents the chance to create a petition requesting a permanent street improvement. Since a large number of Wimbledon Dr. residents were not represented at the meeting, the City Commission elected to keep Wimbledon Dr. on the cape seal list, with the understanding that should the residents of Wimbledon Dr. be able to quickly assemble a petition indicating majority support prior to the public hearing of necessity (already scheduled for July 22, two weeks later), then the City Commission would consider taking them off the cape seal list.

The Engineering Dept. worked with a small team of owners who worked diligently collecting signatures on the City's official form. Ten days later (July 18), a petition representing 47% of the owners on the street had signed the petition. The signatures represented almost 52% of the front footage to be assessed. Further, the organizers made it clear that they would continue their

efforts, and fully expected to collect more signatures prior to the hearing the following Monday. By the time of the meeting, the actual owners in favor of the project had increased to 52%.

The City Commission expressed favor toward the residents present, and removed Wimbledon Dr. from the cape seal list for the 2019 construction season. Currently, an informational booklet is being prepared to be mailed out to all residents later this month. An informational meeting has been scheduled for September 10.

CITY OF BIRMINGHAM

UNIMPROVED STREETS STUDY COMMITTEE

PAVEMENT IMPROVEMENT OPTIONS





INTRODUCTION

The City of Birmingham has created an Unimproved Street Study Committee to examine unimproved roads throughout the City and provide a recommendation outlining a long-term plan for these roads. Unimproved roads make up approximately 26 miles of the roughly 90 miles of roads under Birmingham's jurisdiction. Many of these roads were originally constructed as gravel roads in the early part of the 20th century with little to no provisions for drainage. Starting in the late 1940's, the City began installing chip seals over these roads to address the ongoing issues associated with gravel roads. The City has continued to maintain the unimproved roads utilizing a cape-seal process, which is comprised of a slurry seal over a chip seal. This process creates a non-structural driving surface to improve the look and feel of the roadway for a relatively low cost. These roads require maintenance that is more frequent and there has been growing concern regarding their durability and maintenance cycles.

The City has engaged OHM Advisors to provide additional information to the Study Committee for their use in development of a long-term plan to address the unimproved roads within the community.

GENERAL STREET IMPROVEMENT CONSIDERATIONS

DRAINAGE

A critical component in the design of a new roadway is how to handle drainage. Storm water runoff must be managed both for pavement performance/longevity and safety of motorists using the roadway. Water intrusion and accumulation in the pavement structure as well as the underlying subgrade cause many issues with roadway performance. Water in the subgrade and aggregate layers beneath the pavement can weaken these materials by increasing pore pressure and reducing shear resistance, which weakens the overall pavement structure. Saturation of underlying soils can also cause expansion, especially when the trapped water freezes. This action during freeze-thaw cycles is a primary cause of roadway deterioration in Michigan. Moisture can also accelerate degradation of both asphalt and concrete pavement itself by fostering distresses such as chemical reactions and aggregate stripping.

There are two primary methods of reducing water effects on the pavement are through surface drainage and subsurface drainage. Surface drainage is addressed with pavement cross slope and longitudinal grade to flow surface runoff from the pavement to a storm sewer or drainage ditch. In most urban/developed areas, roads include curb and gutter to route storm runoff to a storm sewer system. Roadside ditches can also be an effective method to provide surface drainage, but they require significant maintenance in order to function properly. In order to preserve the mature trees that exist along the unimproved roads in Birmingham, roadside ditches may not be a feasible option. Subsurface drainage is concerned with removing water that infiltrates through or is contained in the underlying subgrade. This can be addressed with aggregate drainage layers and underdrains.



Most of the unimproved roads within Birmingham appear to have been originally constructed with little or no provisions for drainage. Storm sewer systems were not typically included on local gravel streets when many of the streets within the City were developed. It does not appear that ditches or other drainage methods were included with the original construction. Curb and gutter and storm sewers have been added to a number of the unimproved roads to provide a means for drainage. When these streets are improved, drainage will need to be addressed. Areas with existing storm sewer should be reviewed to ensure sufficient sizing, spacing, & capacity for drainage. All roads to be improved should include provisions for subsurface drainage as well.

SUBGRADE

Subgrade refers to the existing soil materials upon which the pavement structure is placed. Performance of the subgrade can have a significant impact on the overall performance of the roadway pavement. The subgrade must be able to support loads transferred from the pavement structure. This is especially important for asphalt roadways, where the aggregate base and subgrade are an integral part of the overall pavement support strength. Concrete pavement generally distributes loads over a larger area, resulting in lower pressure on the subgrade. The soil makeup of the subgrade is also an important consideration, as certain soils have large volume changes when exposed to excessive moisture or freezing conditions.

Since the unimproved roads within the City have existed for quite some time, there is not a major concern with strength and compaction of the existing subgrade. The gravel base has been in place and built upon over time, and there does not appear to be areas of subgrade failure. As the roads are improved, the subgrade should be evaluated and considered in the overall pavement design. Any areas of poor subgrade should be addressed with undercuts or reinforcement as required.



TRAFFIC AND LOADING

The amount of traffic, especially trucks and other heavy vehicles, is an important factor in the design of road pavements. The unimproved roads within the City are local streets that do not carry a significant volume of traffic. They primarily serve residential neighborhoods and are utilized by passenger cars with the occasional delivery/service truck or bus. Several of the unimproved roads serve as neighborhood collectors, which see slightly higher traffic volumes, but these are still low in terms of traffic loading impact to the pavement.

PAVEMENT MATERIAL CONSIDERATIONS

The decision on which pavement material to use is asked on every road reconstruction project. Neither material is necessarily better than the other, and each can be ideal for specific projects.

CONCRETE

In general, concrete roadways have a longer service life than asphalt. The typical design life of concrete pavement is 30 to 40 years, but their lifespan can stretch to 80 years or more if constructed and maintained properly. This durability is a primary reason this material is utilized on many roadway projects. Concrete is also considered a “rigid” pavement, which means it can carry heavy loads and also distribute those loads over a larger area. As a result, concrete pavements do not need underlying aggregate base layers for strength and load carrying capacity.





Initial construction costs for concrete roads are typically higher when compared to asphalt. The costs of concrete and asphalt materials fluctuate regularly, but local road construction with concrete is generally higher. Based on recent experience, initial construction costs for concrete local road pavements average \$165/foot (6-inch) to \$185/foot (7-inch). Though the initial construction costs are higher, the overall lifecycle cost of a concrete roadway may be less due to longevity of the pavement and required maintenance over its life.

In most cases, concrete pavement requires less frequent maintenance during its service life when compared to asphalt. However, when concrete repairs are required, they are usually more impactful to the roadway. Routine maintenance involves joint and crack sealing to prevent water intrusion beneath the pavement. Over time, a portion of the concrete will deteriorate and will require joint repairs and/or selective panel replacements. Overall, these maintenance activities are infrequent with the more significant work occurring in the later portions of the road's life span.

The initial construction duration for a concrete local road is typically longer than that of an asphalt local road. The required time for the concrete to cure before use also results in longer times residents don't have access to their properties during construction. If the concrete road is built with integral curb, it can reduce the construction duration by several weeks.

For local/residential roads similar to the unimproved roads being considered in Birmingham, the concrete pavement thickness is typically between 6 and 8 inches. The main variables used to determine an appropriate thickness are the strength of the subgrade and the anticipated truck traffic loading. These variables should be verified with each project to ensure an appropriate design, but many communities throughout the region have adopted "standard" sections for consistency. Based on the low anticipated truck volume and existing stable base for the unimproved streets, a standard concrete thickness of 6 or 7 inches could be utilized by the City.



ASPHALT

The typical design life of asphalt pavement is 15 to 20 years. With maintenance and rehabilitation treatments, this life can be extended to 30 years or more. Asphalt is considered a “flexible” pavement, which means it relies on underlying aggregate base layers for strength and load carrying capacity. The initial construction duration for an asphalt local road is typically shorter than that of a concrete local road. Asphalt can be placed quickly and then open for traffic use the same day.



Initial construction costs for asphalt roads are typically lower when compared to concrete. The costs of concrete and asphalt materials fluctuate regularly, but local road construction with concrete is generally higher. Based on recent experience, initial construction costs for asphalt local road pavements average \$125/foot (3-inch) to \$140/foot (4-inch). Though the initial construction costs are lower, the overall lifecycle cost of an asphalt roadway may be more due to a shorter service life and increased maintenance over its life.

Generally, asphalt pavement requires more frequent maintenance during its service life than concrete. As the asphalt ages, it becomes more brittle and cracks develop from the flexing strains. Also, areas of poor underlying soil can cause the pavement structure to fail prematurely under heavy loading. There are more maintenance options available for asphalt pavements than concrete, and many of them can be completed quickly with minimal impact to road users. Crack sealing is critical to prevent water intrusion and additional deterioration. Surface treatments such as slurry seals, can be utilized to extend the life of an asphalt road. Rehabilitation of the roadway via patching and/or overlays can also be effective to extend the service life.



For local/residential roads similar to the unimproved roads being considered in Birmingham, an asphalt pavement section is typically between 3 and 4 inches of asphalt on 8 to 10 inches of aggregate base. Similarly to concrete, the main variables used to determine an appropriate pavement section are the strength of the subgrade and the anticipated truck traffic loading. Based on the low anticipated truck volume and existing stable base for the unimproved streets, a standard section of 4 inches of asphalt on 8 inches of aggregate base could be utilized by the City. Asphalt roads should include curb and gutter to handle drainage. There are a number of curb options and configurations that could be used.

PAVEMENT OPTION COMPARISON

The following table summarizes the design life, initial construction cost, and anticipated maintenance cost for several local road paving options:

Type	Design Life	Initial Cost ¹	Avg. Maint ²
6" Concrete w/curb	30-40 years	\$380/foot	\$2.25/ft/year
7" Concrete w/curb	30-40 years	\$400/foot	\$2.25/ft/year
* 7" Concrete w/curb & 8" drainage layer	40+ years	\$450/foot	\$1.75/ft/year
3" Asphalt on 8" aggregate w/concrete curb	15-20 years	\$325/foot	\$5.00/ft/year
* 4" Asphalt on 8" aggregate w/concrete curb	15-20 years	\$340/foot	\$4.50/ft/year

¹Initial construction cost including administration, sidewalk, driveways, utilities, etc.

²Anticipated total maintenance costs over the life divided by life to determine average.

*Of the options listed above, we typically see 4" asphalt or 7" concrete pavement sections utilized for local road paving throughout the region. We would recommend that the asphalt section include at least 8" of aggregate base, concrete curb and gutter, and underdrains. We would recommend that the concrete section include integral curb and a drainage layer to extend the pavement life as long as possible. The City of Birmingham could consider each of these pavement options in their evaluation for projects to improve the remaining unimproved streets throughout the City.

FUNDING STREET IMPROVEMENTS

There is a significant cost associated with constructing roads within any community. Many cities throughout the region constructed many of their local road networks through ambitious construction programs. Many of these programs were funded through bonds that were paid back through a local millage or creation of special assessment districts (SADs). If possible, road construction should be combined with other utility (water/sanitary) work in order to share costs for traffic control and other general condition items.

SAD'S

Communities differ greatly on the amount of the project costs that are charged to property owners through a SAD, with some charging 100% of the cost to others charging 50% of the cost. Our experience has been that most cities in the region that utilize SAD's for local street improvement charge 80% to 100% of the cost to the benefiting property owners. This is especially true for areas where the local streets only serve the neighborhood in which they are



located. If the local road being improved is more of a collector, serves more than one neighborhood, or has a large amount of pass-through traffic, then the percentage of charge is typically reduced to between 50% and 75%. Some communities increase the amount of city share in the SAD to 40% to 50% in order to encourage utilization of the process for road improvements.

Nearly all of the SAD programs we have been involved with in the area are initiated through a property owner petition process. This is done to ensure that the property owners who will be included in the SAD are in support of it prior to the municipality expending resources on the project. As the petition process can be daunting to residents, most cities assist with preparing petition forms, project information, process guides, etc. or will even host and participate in a public informational meeting. Another technique used by some communities that seems to work well is an annual city-issued call for proposals/petitions for potential road improvements. A packet of information with all of the documents to initiate the petition are provided to respondents of the call.

By law, municipalities have authority to establish SAD's. In some cases, SAD's are initiated by the City without a petition request from the property owners. We have seen this in instances where road conditions have become seriously degraded and become an issue of safety and overall community appearance. This is rare, since the property owners will typically desire their roads improved and initiate a petition prior to the roads deteriorating to that point. Cities that initiate the SAD process may experience more objections during the process than those that are initiated by the property owners, but that is not always the case. In addition, the cities that initiate the SAD process for road improvements usually charge 50% to 60% of the project cost to the property owners.

MILLAGE

Many communities fund their road programs through a city-wide millage. This can be an effective way of generating consistent revenue for a comprehensive asset management strategy for the road system. Cities typically utilize road millages to rehabilitate and reconstruct deteriorated streets as well as fund ongoing maintenance activities. Since the millage is across the entire city, the programs that are more successful have relatively consistent road conditions throughout the community. Construction of new roads or improvement of those that have not been done previously is typically not included in the millage program. Those improvement projects are still done using an SAD process, but a reduced portion of the cost may be charged to the property owners since they are also participating in the overall millage. Since less than 30% of the road network in Birmingham are unimproved roads, it may be challenging to employ a city-wide millage to fund their improvement.