

2017 City of Houghton Asset Management Plan



PREPARED BY:
WESTERN U.P. PLANNING AND DEVELOPMENT REGION



Table of Contents

1	Current Assets	5
1.1	Asset Inventory	5
1.2	Componentized Asset Inventory	6
1.3	Current Data and Software Tools	7
2	Finances	8
2.1	Current Asset Investment	8
2.2	Income	8
3	Managing Lifecycles.....	9
3.1	Current Conditions.....	9
3.2	Level of Service	13
3.3	Assess Treatment Alternatives	13
4	Make and Know the Rules.....	14
4.1	Strategic Goals	14
4.2	Legislation, Policy, and Standards.....	16
5	Decision Making	17
5.1	Evaluate Decision Process.....	17
5.2	Basic Process Improvement Plan.....	18
6	Establishing Sustainability	19
6.1	Sustainability Assessment.....	19
6.2	Program Coordination	21

Foreword

This document is the City of Houghton's Asset Management Plan for its street and road network. It is intended to serve as a guiding document for all street work and improvements in the City of Houghton. The plan has been developed using best practices from the Michigan Department of Transportation (MDOT), which defines asset management as "a process to strategically manage our transportation system in a cost-effective and efficient manner" with six major elements:

1. Knowing your assets.
2. Knowing your finances.
3. Managing your lifecycle.
4. Make and know the rules.
5. Decision making.
6. Establishing sustainability

The plan was first adopted in 2017 and will be formally updated every five years, with annual status updates recommended. When approved by MDOT's Transportation Asset Management Council (TAMC), the City's asset management plan will be the first such plan in the Upper Peninsula. As of November 2016, of 533 total municipalities with road responsibilities, 28 (5.2%) have approved active plans, while 34 others (6.4%) have expired plans on file with the TAMC. At this time, Dickinson County is the sole U.P. municipality with an approved plan.

Although this City of Houghton asset management plan reflects the best practices currently in use by road agencies across the state, it is tailored to the unique set of circumstances and data relevant to the City of Houghton's street network. The plan will evolve from year to year as the City gains experience in integration of the plan with regard to application of various preventative maintenance techniques.

Overview of Asset Management

The State of Michigan has been actively pursuing Asset Management since 1998 when the Michigan Legislature established the Act 51 Transportation Funding Committee. (Public Act 51 of 1951 is the law that sets the funding allocation for state transportation fund revenues allocable to MDOT, counties/road commissions, and cities and villages.) Continued support of Asset Management has occurred as the Legislature established the Transportation Asset Management Council in Act 499 of 2002, encouraged the use of Asset Management in decision processes through Act 338 of 2006, and continued to refine Asset Management in Michigan through act 199 of 2007. Asset Management, according to Public Act 199 of 2007, means an "ongoing process of maintaining, upgrading, and operating physical assets cost-effectively, based on a continuous physical inventory and condition assessment."

The implementation of asset management decisions processes allows an agency to make the best decisions for their transportation network with the best information they can collect. The process enables good stewardship, transparent decision processes, and measureable performance. The following figure provides an overview of the asset management process.

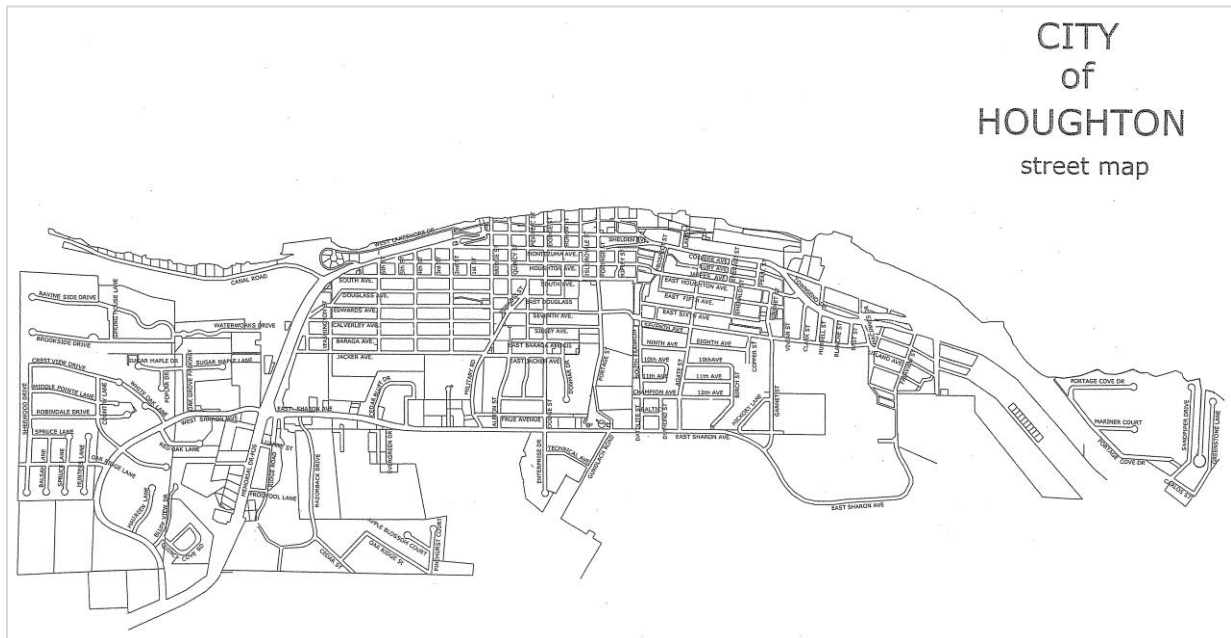


1 Current Assets

The City of Houghton is the jurisdictional authority over all public roads lying inside the City limits, exclusive of any state trunkline highways and county roads. Public Works operations staff in the City of Houghton maintains 9.777 miles of major streets and 25.025 miles of local streets, making a total of 34.802 miles for which the City is responsible. This includes routine maintenance (plowing, salting, sweeping, crack sealing, etc.), preventative maintenance, heavy maintenance, and reconstruction. The City also is under contract with MDOT to perform routine maintenance on state trunkline highways M-26 and U.S. 41. Curb and gutter is found in many, but not all, areas of the City. Given the City's age, many streets have a base that would be considered substandard by today's design standards.

1.1 Asset Inventory

MDOT annually certifies all public roads within the State of Michigan. Certification maps are maintained by the City and are the basis for determining the amount of money received from the Michigan Transportation Fund. Generally the City receives a higher level of reimbursement for major streets than local streets. The City's layout and street network is depicted below.



1.2 Componentized Asset Inventory

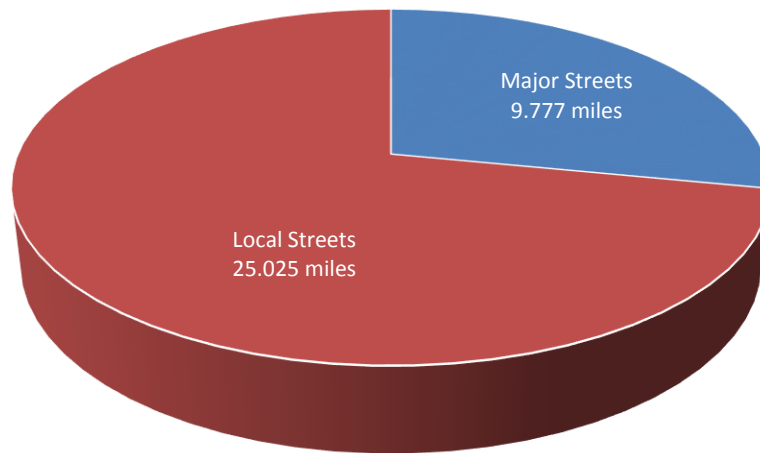
Knowledge of the number of miles under the jurisdiction of the City of Houghton is an important basis for understanding the current public investment. In order to gain in-depth knowledge about the public investment, more information must be known about the assets. In particular, it is important to understand the types of road surfaces the city currently maintains.

The City has jurisdiction over two systems of paved roads: major streets and local streets. City major and local street systems established by Act 51 are designated by a municipality's governing body, subject to the approval of the State Transportation Commission. Major streets are chosen according to their importance to the municipality; all other streets are local streets. These street systems include no county roads or state trunkline highways.

Surface Type (miles)	
Asphalt	34.802
• Major Streets	9.777
• Local Streets	25.025
Total	34.802

Source: RoadSoft

City Wide Road Inventory by Mileage



In the future, the City will be able to gain a better understanding of the value of pavement assets by improving the quality of the road surface asset information they have. The basic road surface inventory must be maintained and expanded. Once this basic information is improved, it can be incorporated into the decision making process more readily.

1.3 Current Data and Software Tools

Data about the pavement and road surface assets under the city's jurisdiction are maintained by two departments. These departments are Administration and Public Works.

Administration

The Administration department under the oversight of the city council oversee the business functions of policy-making, budget, accounts receivable / payables, employment, bargaining units, workers compensation and safety, employee benefits, community relations, and technology.

Public Works

The Public Works department maintains all city streets. Maintenance consists of cold patching potholes, line striping, cleaning catch basins and sweeping. Crews also build approximately 500 to 1,500 feet of new streets almost yearly. During street construction, crews install all necessary water and sewer mains along with the necessary drainage.

The City uses multiple data sources and software packages to manage current asset data and cost information. The following table lists these tools along with their functions and locations.

Data Source/Software	Function/Purpose/Data	Location
RoadSoft	Roadway Asset Management System <ul style="list-style-type: none"> • Asset Inventory • Asset Condition Data • Asset Deterioration Modeling • Strategy Evaluation 	Server
Microsoft Office Excel and Word	<ul style="list-style-type: none"> • Annual Work Program • Cost Information 	Server
Hard Copy	<ul style="list-style-type: none"> • Maintenance history work sheets 	Vault

2 Finances

Houghton is an independent financial entity. The city adopts an Annual Budget, and approves all expenditures in accordance with accepted accounting principles for government agencies. An independent audit is performed annually on the city accounts, and the results are provided to the Michigan Department of Treasury.

2.1 Current Asset Investment

The City currently invests in 34.802 miles of streets, all of which are constructed of standard asphalt. The proposed average annual spending on street maintenance, improvement, and reconstruction over the next 5 years (2017-18 through 2021-22), including a small percentage dedicated to beautification and signage as well as pedestrian and bicycling improvements, is \$1,398,667. The City's capital improvements plan, which shows individual projects, is in the **Appendix**.

2.2 Income

The City's street fund revenues are derived primarily from Act 51 Michigan Transportation Fund and Winter Maintenance revenues for all streets in addition to tax levies for local streets; FY 2016 amounts are shown in the table below. The City also receives State Trunkline Preservation funds for maintenance of highways U.S. 41 and M-26 under contract for MDOT, but these are not included in the table as the funds do not impact other City streets.

Revenue Source for FY 2016	Major Streets	Local Streets
Michigan Transportation Fund (Act 51)	\$367,835	\$148,863
Winter Maintenance (Act 51)	\$42,212	\$57,526
Other State	\$21,923	\$77,468
Interest	\$1,482	\$2,924
Tax Levies	\$0	\$145,778
Total	\$432,822	\$432,559

Other typical funding sources contributing to street projects include Downtown Development Authority/Tax Increment Financing and other MDOT programs. United States Department of Agriculture – Rural Development funds are incorporated into street projects that include utility replacement components.

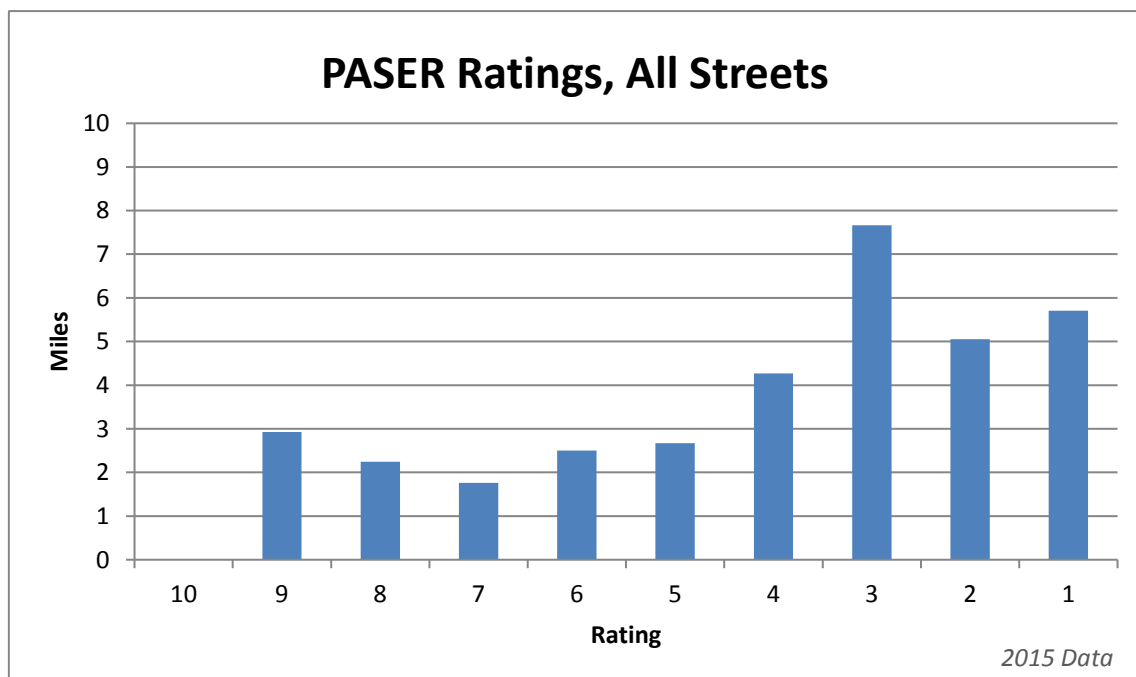
3 Managing Lifecycles

3.1 Current Conditions

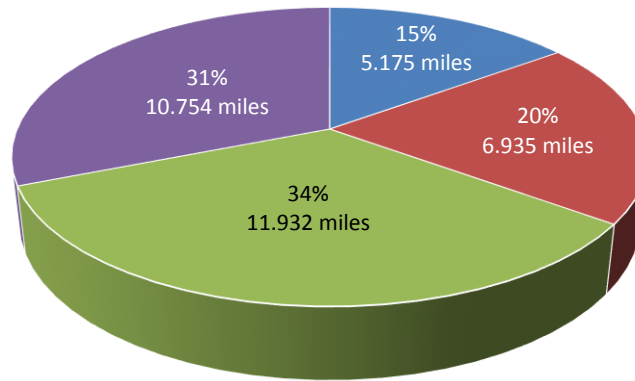
The City of Houghton is committed to continually reevaluating the current conditions of the transportation system. Part of this effort goes into evaluating the current road surface conditions with the Pavement Surface Evaluation Rating (PASER) system. The PASER system is the preferred method for Michigan agencies to rate their road pavements. PASER ratings for HMA or concrete surfaces are defined in the following tables.

Asphalt PASER Rating	Condition	Treatment
9 & 10	Excellent	No maintenance required
8	Very Good	Little or no maintenance
7	Good	Crack sealing and minor patching
5 & 6	Fair – Good	Preservative treatments (non-structural)
3 & 4	Poor – Fair	Structural renewal (overlay)
1 & 2	Failed	Reconstruction

During fall 2015, the City, in conjunction with WUPPDR performed complete PASER ratings on all streets and roads in the City. These ratings are depicted in maps in the **Appendix**. The following figures summarize the PASER rating data for the City.



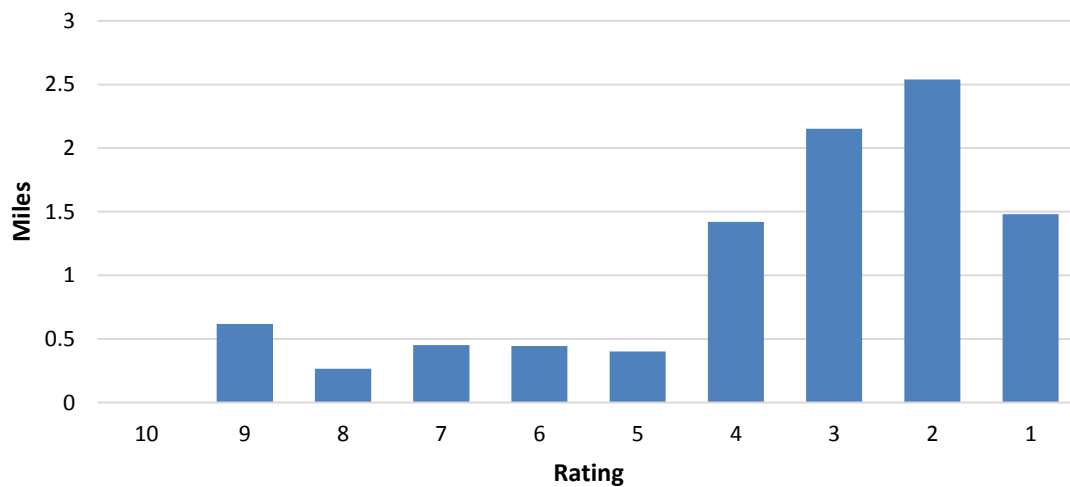
All Streets by PASER Rating Group



■ Good (10-8) ■ Fair (7-5) ■ Poor (4-3) ■ Very Poor (2-1)

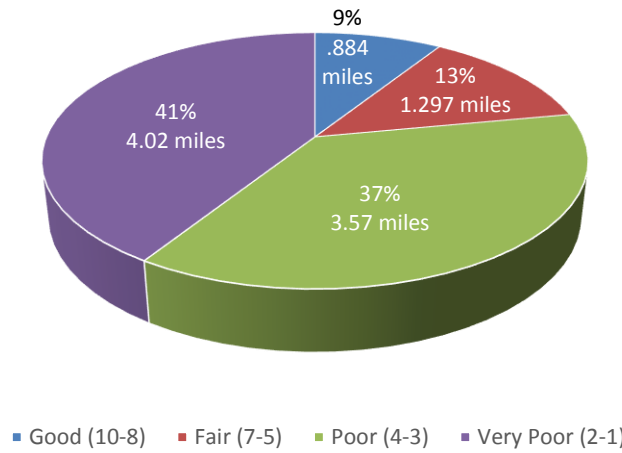
2015 Data

PASER Ratings, Major Streets



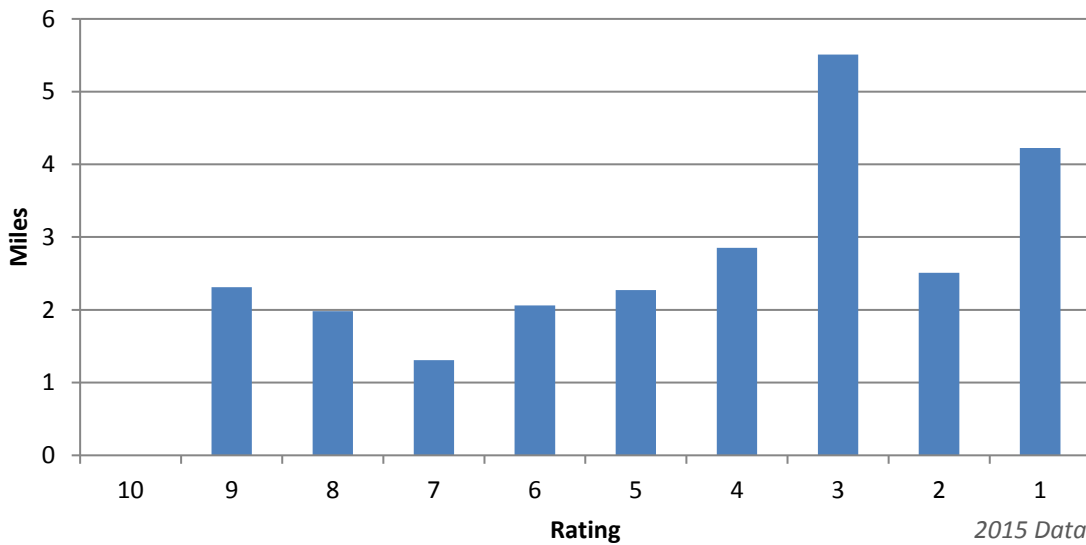
2015 Data

Major Streets by PASER Rating Group

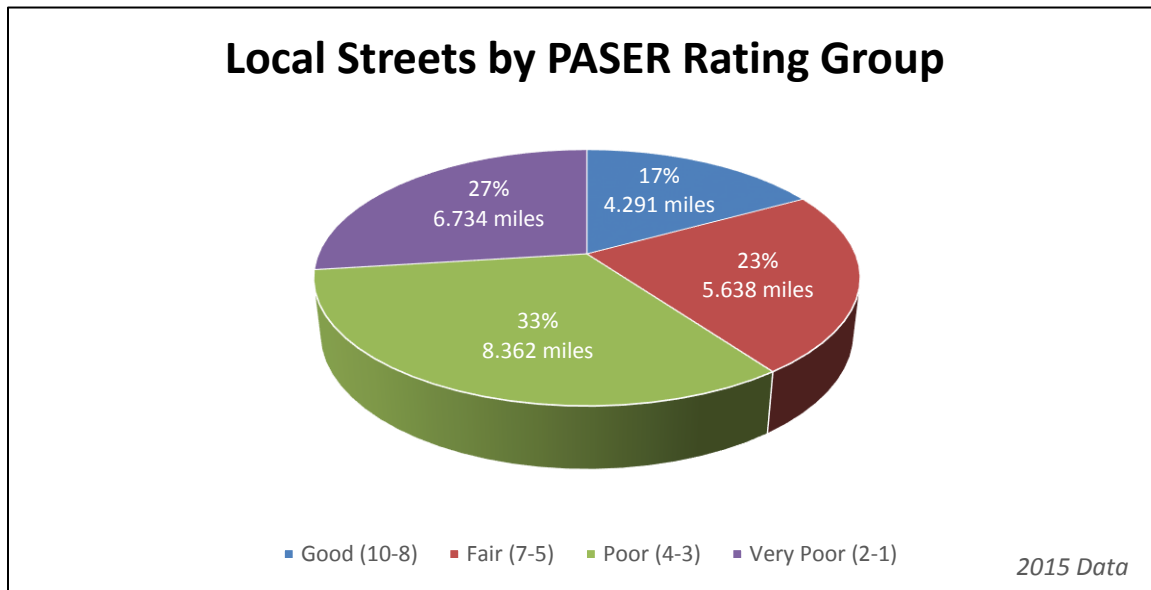


2015 Data

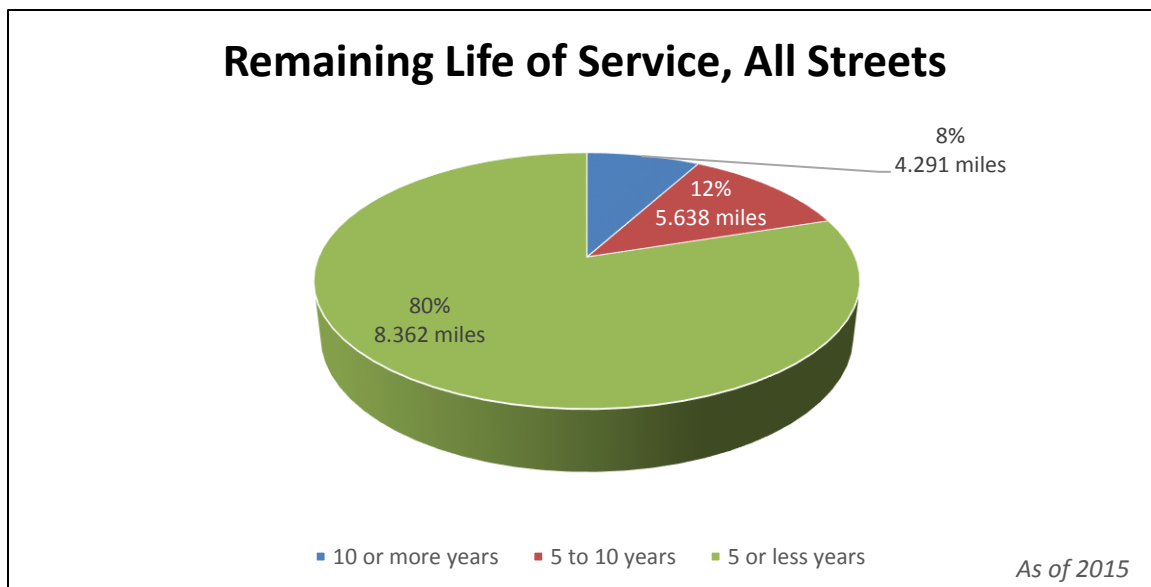
PASER Ratings, Local Streets



2015 Data



The current known ratings provide important information regarding the estimated remaining life for the pavements owned by the City. The estimation of remaining life of service is based on the standard degradation models included in the PASER rating system. The following chart provides a breakdown of the expected remaining service life (RSL), with a PASER rating of 10 or 9 having more than 10 years of remaining service life, a rating of 8 or 7 having an RSL of 5 to 10 years, and a rating of 6 or below equating to less than 5 years RSL. The PASER rating is a reflection of the surface quality of the roadway, not an absolute indicator of quality. A roadway with a low PASER rating, or one past its RSL, may still be a usable road.



3.2 Level of Service

The City of Houghton is responsible for maintaining a road system that is reasonably safe and convenient to the traveling public. This charge for good stewardship requires the city to establish level of service goals for the operations and maintenance of the roads. The city has currently published goals for winter weather operations and new development.

Winter Operations

Houghton has established four priority rankings for plowing and winter operations activities. These priority rankings are:

- Priority 1 – State trunkline routes
- Priority 2 – High volume paved roads
- Priority 3 – Medium volume paved roads
- Priority 4 – Subdivision roads

To enable maximum level of plowing services, beginning on November 1st and lasting until April 15th, the city implements a ban on all overnight parking on the road sides of major and local roads where roadside parking is usually permitted. This gives the city ample time and room for plowing.

Road Surfaces

Houghton has been exploring the possibility of setting service goals for the maintenance of pavements under the city's jurisdiction. The service goals have not been formally adopted at this time. However, the city has selected the goal of 80% of all paved surfaces in good or fair condition, according to PASER ratings, as something they would like to achieve.

3.3 Assess Treatment Alternatives

Houghton currently uses the treatment alternatives prescribed in the Asset Management Guidelines for Local Agencies. The city has found these alternatives to be limiting on the basis of funding restrictions and MDOT's distinctions between 2R and 3R projects.

Houghton is currently working to establish a broader toolkit. The new toolkit will allow the city to have more flexibility in choosing treatment options and will provide better solutions. The hope is to develop a toolkit that will include better fixes and optimize service life.

4 Make and Know the Rules

4.1 Strategic Goals

The City of Houghton has a master plan in effect for the years 2014 through 2018. The plan forms the basis for the development of annual goals and strategies to guide our work with our partners and stakeholders, regularly monitor and report on those efforts, and review and adjust plans as necessary.

Vision Statement

The City of Houghton's vision is to become a destination community in the Upper Peninsula of Michigan by providing excellent public infrastructure, high-quality education, diverse employment opportunities, and high quality of life. As part of fulfillment of the infrastructure vision, the master plan includes a strategy to "pave and maintain local streets as funds become available." An efficient and systematic approach is vital to accomplishing this. Another relevant strategy is to "implement the Complete Streets Ordinance" to improve the multi-modal system, and this ensures diverse stakeholder involvement.

We also aspire to provide high-quality public services through an open and fair decision-making process to meet the needs of residents and visitors. We recognize that our success is dependent upon the collective talents of our staff and community resources to meet the challenges. We commit to attracting the best and brightest workforce, strengthening their skills and promoting and rewarding excellence, while nurturing diversity and encouraging innovation.

Guiding Principles

Promote openness and transparency in decision-making

The City of Houghton's actions must comply with legal requirements and professional standards. We will ensure that the community understands these obligations in the decision process, and to the extent we can, we will exercise flexibility in the application of professional standards to address strongly felt needs of the community. As a public body we also have an obligation to comply with statutory requirements such as the Open Meetings Act and Freedom of Information Act requirements. We are committed to exceeding these requirements to ensure openness in our decision-making, make appropriate information available in a timely fashion consistent with legal requirements, reach out to the larger community through the media and other ways to ensure that the community is aware of the decisions we make and the basis for those decisions.

Provide ample opportunities for participation by the public and local government

We are committed to providing ample opportunities for public participation and input into decision-making processes. In addition to mandated public hearings we will make an affirmative effort to notify and engage residents in neighborhoods particularly impacted by proposed projects, and we will work to identify community concerns and needs and address those concerns.

Be conscientious stewards of the public's money

As a public agency, we use public resources from the Michigan Transportation Fund, federal and state grants, as well as developer contributions to support our work. We are committed to being effective stewards of these resources, ensuring the long-term fiscal stability of the City, employing cost-effective solutions to projects, continuing to explore ways to reduce the costs of operations, continually striving to improve service delivery and productivity, and ensuring a high level of customer service in all that we do.

Value diversity

We serve a demographically and socioeconomically diverse international community. We are committed to serving the entire community, and reflecting our diversity through staffing, projects, and vendors, and in our partnerships.

Be sensitive to the environment

Consistent with legal obligations and professional standards, we will be sensitive to the impact we have on the natural and built environment, seek to minimize that impact and, to the extent possible within financial and other constraints, seek to enhance and improve the environment. Where possible, consistent with the values of City of Houghton residents, we will make decisions and execute activities in a way that is a model of environmental stewardship for other road agencies. We will respect historical values reflected in the built environment to the extent we can and be sensitive to concerns regarding local and county objectives to minimize sprawl and protect open spaces.

Value all employees

We recognize that our success is largely dependent on the talents and skills of employees. We believe that every employee has a role to play in making a positive difference for the success of our agency. We are committed to hire and retain the best possible employees, evaluate them regularly, provide opportunities for professional development and advancement, pay them competitively, reward success and innovation, and treat them with dignity, fairness and respect.

Provide leadership in transportation planning and road system improvement

While we are responsible to the people of the City of Houghton through the elected City Council, we also recognize an obligation to share our insights, experience and expertise in transportation and in providing transportation services with others. We will support regional and state transportation initiatives through active engagement in implementation of regional and state transportation plans and by partnering on projects with MDOT. We will continue to strive to be recognized as a source of innovation and cutting-edge performance in everything we do.

4.2 Legislation, Policy, and Standards

The City of Houghton has adopted and functions in accordance with generally accepted national and Michigan Department of Transportation standards and regulations pertaining to design of roadways and associated features. Practices of traffic control, trip generation and traffic counting, and managing corridor access and related site planning are also in accordance with common standards.

Through establishment and maintenance of this plan, the City of Houghton also complies with Michigan Public Act 199 of 2007, which requires:

“The department, each county road commission, and each city and village of this state shall annually submit a report to the Council. This report shall include a multi-year program developed through the asset management process described in this section. Projects contained in the department’s annual multi-year program shall be consistent with department’s asset management process and shall be reported consistent with categories established by the Council. Projects contained in the annual multi-year program of each local agency shall be consistent with the asset management process of each local road agency and shall be reported consistent with categories established by the Council.”

In addition, under Public Act 338 of 2006, an asset management plan allows the City of Houghton to transfer more than 50 percent of its annual major street funding to the local street system. Without a plan in place, this type of transfer would require MDOT concurrence.

5 Decision Making

5.1 Evaluate Decision Process

Asset management decisions are made with input from the City Council, City Manager, Department of Public Works, and the public. A consensus approach is often utilized to prioritize projects. Project recommendations are submitted by these groups and combined with PASER data to identify critical projects.

The City of Houghton uses several economic and social criteria to facilitate the decision making process in order to prioritize routine maintenance (plowing, salting, sweeping, crack sealing, etc.), preventative maintenance, heavy maintenance and reconstruction. This process takes into consideration the condition of a pavement, stakeholder needs, and the changing needs of the area around a road. The decision process is focused around the following criteria:

- General road conditions using observational road rates (e.g. PASER)
- Project costs
- Traffic volume
- The potential of projects to decrease harm to life and property
- The potential to enhance road network continuity
- The potential to increase access and economic development
- The ability to coordinate with other projects that may be disturbing the roadway (e.g. utility work)
- Opportunities to partner with neighboring municipalities (e.g. City of Hancock) or the Houghton County Road Commission to enhance projects' potential to positively affect the aforementioned criteria

Potential Gaps

The following decision management gaps have been identified:

- Access to current data related to the criteria described above
- Integration of multiple criteria into decision making process

5.2 Basic Process Improvement Plan

- **Gap 1. Access to Current Data**

The amount of time between road condition ratings and project implementation is often considerable. This may result in a treatment alternative that could be inappropriate based on the current condition of the road surface. The City is interested in developing strategies to minimize the chance for misalignment.

- **Gap 2. Data integration**

City administration is proactively pursuing decision management software upgrades and training to better inform asset management decisions. The City currently relies on a number of software platforms and data input sources to inform its asset management decisions. However, multiple platforms and the volume of data can provide an overwhelming amount of information for decision making bodies.

The City has recently procured Esri ArcGIS software that could help manage spatial data pertaining to road quality, traffic density, maintenance routes, etc. GIS software has the potential to integrate a number of data sources and conduct multi-criteria decision analysis to identify projects using weighted decision criteria. Application of this software requires additional staff expertise and resources.

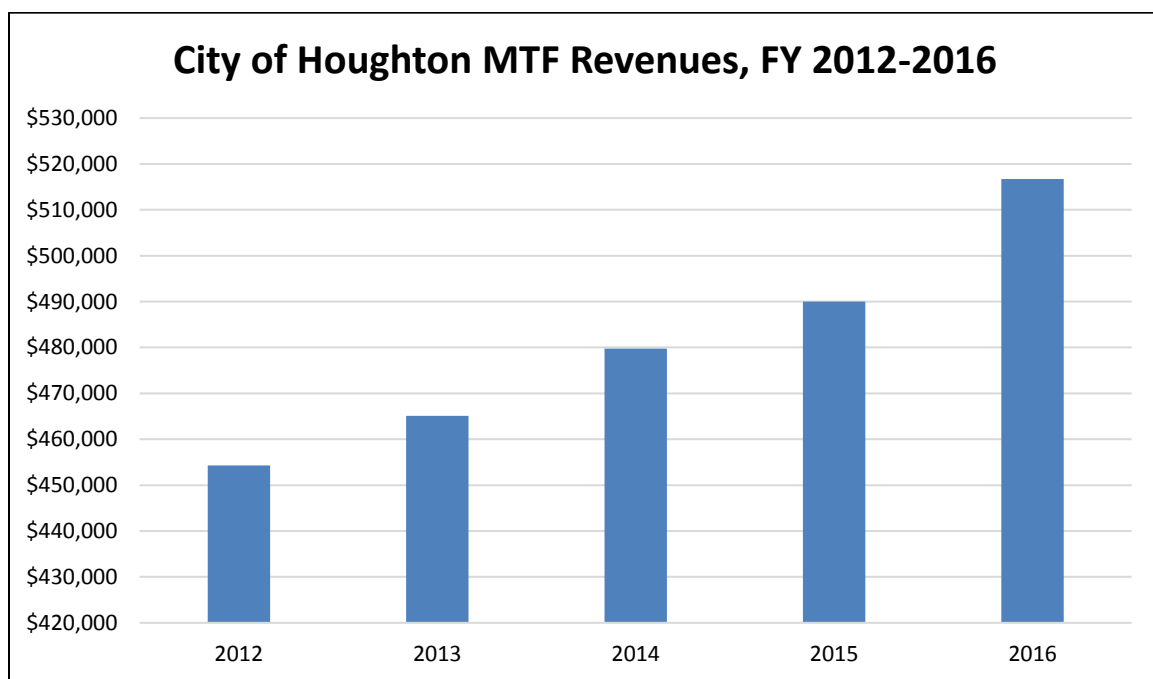
The City is exploring opportunities to work with the Western Upper Peninsula Planning & Development Region (WUPPDR) to capitalize on region-wide GIS data collection and analysis. Potential opportunities exist in road network analysis to optimize winter road maintenance activities. Partnerships/collaboration with Michigan Technological University may present opportunities to explore other data integration platforms, facilitate training opportunities, and increase staff capacity (as through student internships).

6 Establishing Sustainability

6.1 Sustainability Assessment

The City of Houghton continually monitors the needs of the street system and the status of income sources to determine the sustainability of near-term and long-term plans and goals. The City has determined that projected income will not meet the needs of pavements under its jurisdiction. Thus, the City will not be able to maintain a steady state of road repair and meet its goals for pavement conditions.

The following chart provides the revenue received from the Michigan Transportation Fund (MTF) from fiscal years ending 2012 to 2016. Although MTF revenues have steadily risen over the past five years, increases have not kept pace with road maintenance needs.

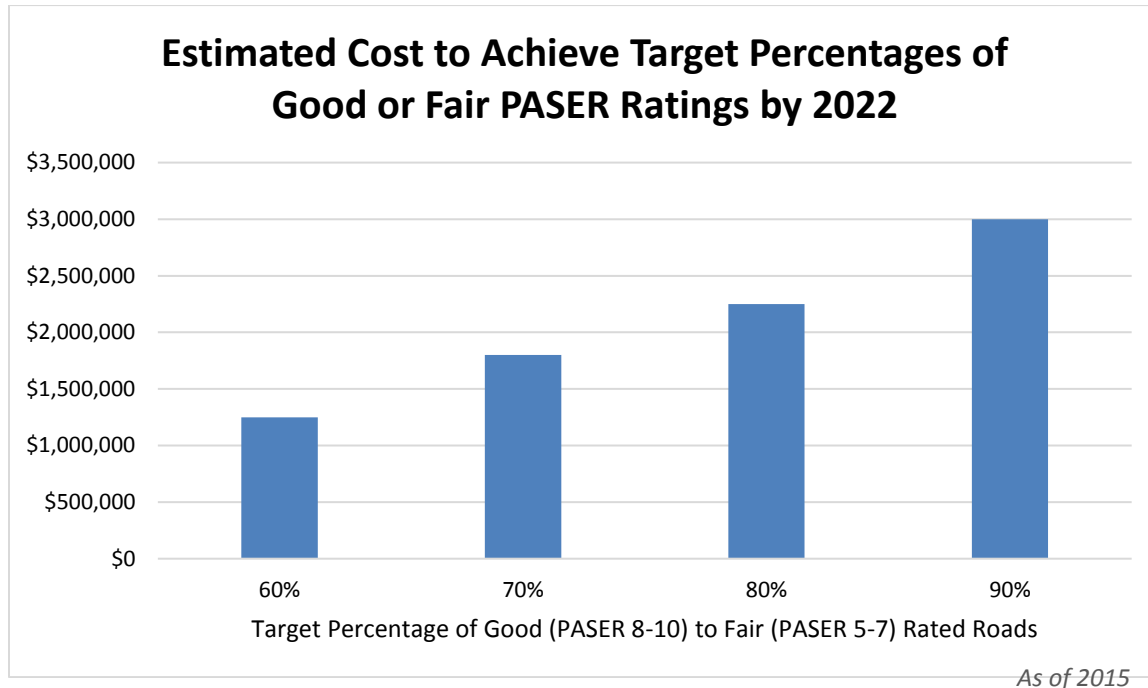


In late 2015 the Michigan Legislature passed a comprehensive road funding package that will increase revenues to all Act 51 road agencies including the City of Houghton. MDOT has created a MTF revenue estimation formula that incorporates this "New State Restricted Revenue Package." For the City of Houghton, the formula (as of May 17, 2017) predicts total MTF revenues of:

- **\$690,274** for the period October 2017 – September 2018
- **\$743,840** for the period October 2018 – September 2019

This represents a significant initial jump in funding from the City's FY 2016 and a much more rapid year-on-year increase thereafter. Nevertheless, the City has considerable deferred street maintenance, and it is recognized that costs for the renewal and replacement of pavements will continue to increase along with revenues.

The City of Houghton has estimated the funding requirements to bring various percentages of city streets to good (PASER 8-10) or fair (PASER 5-7) condition while preserving the ratings of other streets. The City's goal is to bring 80 percent of its streets into good or fair condition. However, in examining targets of 60 to 90 percent, it is apparent that projected revenues will fall far short of estimated funding needed to accomplish any of these targets. The following chart shows the estimated funding required for the various percentages that would raise the proportion of roads in the good/fair categories. These estimates were projected by using the Strategy and Optimization module in Roadsoft.



6.2 Program Coordination

The City of Houghton actively works to coordinate road maintenance, improvement, and reconstruction activities with other public works operations and public utilities. The City will continue this coordination in the future.

Key stakeholders the City of Houghton coordinates with for design input and funding partnerships are:

- ❖ MDOT
- ❖ USDA Rural Development
- ❖ Michigan Economic Development Corporation (MEDC)
- ❖ Upper Peninsula Power Company (UPPCO)
- ❖ SEMCO ENERGY Gas Company (SEMCO)
- ❖ Charter Communications
- ❖ Private sector
- ❖ Citizen groups

The high priority the City places on program coordination was demonstrated most vividly in the 2017 Lakeshore Drive Improvements project. The reconstruction was funded by local sources along with a Michigan Economic Development Corporation (MEDC) Community Development Block Grant in conjunction with MTF-derived revenues, other local funds, and USDA Rural Development funds. In addition to replacing its own water and sewer lines with the street and sidewalks, the City worked with the utilities to have all-new electrical, cable, gas, and fiber-optic lines installed. Throughout the project the City met weekly with the construction contractor and utilities to coordinate work. The City kept the downtown business community apprised of progress through frequent e-mail updates and proactively addressed concerns such as trash collection and delivery access.

Positive experiences and lessons learned from the Lakeshore Drive project will inform coordinated multi-agency, public-private infrastructure improvements in future projects.

APPENDIX

1. Capital Improvements Plan for Streets
2. Surface Condition Map – Total Road Network
3. Surface Condition Map – Local Road Network
4. Surface Condition Map – Major Road Network

PARKING DECKS AND LOTS								
	Finance Plan	Total Cost	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Mattila Square Parking Lot Improvements	DDA/MEDC	350,000			350,000			
Remaining Repairs Large Parking Deck	Parking/DDA/General	150,000	100,000	50,000				
Parking Lot Expansion on Quincy Street Deck	DDA/Parking	50,000			50,000			
UP Engineering Deck	Parking	15,000	5,000	2,000	2,000	2,000	2,000	2,000
Wells Fargo Bank Deck	Parking	15,000	5,000	2,000	2,000	2,000	2,000	2,000
Subway Deck	Parking/DDA/General	77,000	10,000	50,000	5,000	5,000	5,000	2,000
Quincy Deck	Parking	14,000	4,000	2,000	2,000	2,000	2,000	2,000
Stair towers	Parking/DDA/General	10,000	10,000					
STREETS								
	Finance Plan	Total Cost	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22
Montezuma Avenue Reconstruction	MDOT/DDA	4,000,000						4,000,000
College Avenue Reconstruction and Utilities	MDOT/USDA	2,000,000					2,000,000	
Cedar Street Extension	Major Street/MDOT	1,300,000				1,300,000		
Evergreen Street Extension	Major Street/MDOT	600,000			600,000			
Annual Paving	Major/Local Street	450,000	75,000	75,000	75,000	75,000	75,000	75,000
Street Signs	Major/Local Street	12,000	2,000	2,000	2,000	2,000	2,000	2,000
Annual Sealing	Major/Local Street	30,000	5,000	5,000	5,000	5,000	5,000	5,000
Tree Planting along Shelden Avenue, M-26	TIFA/DDA/Major	60,000	20,000	20,000	20,000			
Replace Mine Rock on slopes downtown and along M-26 with landscape and vegetation	TIFA/DDA	200,000			50,000	50,000	50,000	50,000
M-26 Beautification	TIFA/MDOT	100,000		50,000	50,000			
Roads in Bresnan and Red Oak Subdivisions	TIFA	40,000	20,000	20,000				
Erect Bike Signage in accordance with Signage Plan	TIFA/DDA	10,000	10,000					
Bike/Pedestrian improvements on Seventh Avenue	Major/Local	75,000	25,000	25,000	25,000			
Bike/Pedestrian improvements on Houghton Avenue	Major/Local	50,000	10,000	20,000	10,000	10,000		
Safe Routes to School Intx (Sharon @ Military/Dodge/Portage)	TIFA/Safe Routes Grant	200,000		200,000				
Lakeshore Dr. Reconstruction	Major/Local/MDOT	400,000			400,000			
Ridge Road Repair/Repaving	TIFA	110,000	110,000					
Razorback Drive Repair/Repaving	TIFA	250,000	250,000					

