Supporting Mobility Innovation in Michigan's Western Upper Peninsula

Final Report for the
USDA Rural Business Development Grant
Technical Assistance for Rural Transportation Systems: Connecting Rural Transportation with Economic Opportunity

A Project Funded by the USDA Rural Business-Cooperative Service & Coordinated by the National Association of Development Organizations Research Foundation in Partnership with Montana State University's Western Transportation Institute

Prepared By:
Staff from the Mobility & Public Transportation Program at the Western Transportation Institute
Andrea Hamre, PhD
Research Associate II
David Kack, MBA
Director of SURTCOM & Program Manager

In Partnership With:
Staff at the National Association of Development Organizations Research Foundation

Carrie Kissel
Associate Director
Bret Allphin
Senior Program Manager

Prepared For:
Western Upper Peninsula Planning & Development Region

May 2024

About the Western Transportation Institute and NADO RF

The Western Transportation Institute (WTI) was founded in 1994 by the Montana and California Departments of Transportation, in cooperation with Montana State University. WTI concentrates on rural transportation research; as stewards and champions of rural America, WTI also has a strong interest in sustainability. WTI research groups create solutions that work for clients, sponsors, and rural transportation research partners. WTI Research Centers include the Montana Local Technical Assistance Program, the National Center for Rural Road Safety, the Small Urban, Rural and Tribal Center on Mobility, the Federal-Public Lands Transportation Institute, and the West Region Transportation Workforce Center.

Founded in 1988, the NADO Research Foundation is the nonprofit research affiliate of the National Association of Development Organizations (NADO). The NADO Research Foundation identifies, studies, and promotes regional solutions and approaches to improving local prosperity and services through the nationwide network of regional development organizations (RDOs). The Research Foundation shares best practices, offers professional development training, analyzes the impact of federal policies and programs on RDOs, and examines the latest developments and trends in small metropolitan and rural America. Most importantly, the Research Foundation is helping bridge the communications gap among practitioners, researchers, and policymakers. Learn more at www.NADO.org and www.RuralTransportation.org.

Disclaimers

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Acknowledgments

The study has benefited from the time generously shared with us by staff from the Western Upper Peninsula Planning & Development Region as well as additional staff and stakeholders working on transportation issues in Houghton County, MI. We would like to thank these project partners and stakeholders for the opportunity to work with them and for their time and input during this project.

Staff from Montana State University's Western Transportation Institute and the National Association of Development Organizations Research Foundation express appreciation to the U.S. Department of Agriculture and the Western Upper Peninsula Planning & Development Region for the opportunity to collaborate on and provide consultation for this technical assistance project.

Table of Contents

1 Introduction and Overview

The primary purpose of this project was to provide the Western Upper Peninsula Planning & Development Region (WUPPDR) with technical assistance to support its multimodal transportation and economic development planning efforts, with an emphasis on supporting mobility improvements and innovations in and around Houghton, MI. This project was also an opportunity to compile and share resources about best practices and innovations in transportation policy and planning, which may serve as a helpful reference for rural communities throughout the U.S.

The primary motivation for this project was strong local interest in mobility improvements and innovations, coupled with limited local and regional staff capacity to develop and consider strategies as well as limited interaction and relationship-building among key stakeholders. This project occurs within the national context of increased efforts to prioritize transportation safety and equity as well as widespread challenges for transit systems relating to workforce and budget shortages, and benefits from the increased attention in recent years to these complex and multifaceted issues.

This project was impacted by the ongoing COVID-19 pandemic, which limited travel opportunities to safely conduct site visits to the study area, as well as limited availability from several key staff partners that impacted project engagement. Notwithstanding these unforeseen developments and related challenges, the project team worked to establish and maintain open communication with key partners and to develop practical resources and recommendations with transferable relevance to rural communities facing similar transportation and economic challenges. Figure 1 summarizes the timeline for this project, from the kickoff in the spring of 2022 to the completion in Spring 2024.

Figure 1. Project Timeline

2 Key Concepts and Resources

This section provides a brief overview of key concepts that served as the focus of this multimodal transportation and economic development project: mobility and accessibility, transit coordination, fixed and flexible transit, parking and curbside management, shared mobility, active transportation, and rural community design and placemaking. It is intended to create a working foundation and practical vocabulary to support understanding of the issues and recommendations discussed in the subsequent sections of the report. In addition, key resources accompany the discussion of each concept, to provide opportunities for further familiarization and learning. Many of the resources listed in this section were compiled and shared with stakeholders via the six-part webinar series described in Section 4.1.

2.1 Mobility and Accessibility

Mobility and accessibility are important and distinct concepts for transportation and economic development. While mobility refers to moving through space and overcoming distance, accessibility refers to reaching opportunities. The degree to which accessibility depends upon mobility is impacted by factors such as available travel options, characteristics of the built environment, and land use patterns. As Karner, Levine, Dunbar, and Pendyala (2023, p. 10) assert, "put simply, accessibility – connections between people and opportunities – is the most important economic and social benefit created by a transportation system and it facilitates participation in activities that individuals need to lead a meaningful life."

Mobility innovation, the focus of this project, takes many forms across the spectrum of transportation options and can relate to improvements in accessibility (for persons with disabilities) and availability, safety, convenience, connectedness, and energy and pollution impacts. Increasingly widespread availability of information and communication technologies (including mobile connectivity enabled through smartphones) has enabled a significant increase in the development and deployment of innovative public and private mobility services. Electrification has also been an important component of mobility innovation. Rural communities are well-poised to take advantage of innovative mobility offerings, explore new public-private partnerships, and deploy pilot programs to test the performance of innovative mobility solutions for their communities. Indeed, "instead of playing catch-up with the innovations [piloted] in urban areas, there are great opportunities for rural mobility innovations to develop in their unique context" (ITF 2021, p. 8).

The International Transport Forum's study on *Innovations for Better Rural Mobility* (2021, p. 17) envisioned a Venn diagram of social, economic, and environmental challenges to be addressed by rural mobility innovation, and described three defining questions for rural mobility innovation efforts:

- How can new mobility approaches respond to the diverse needs of rural areas, while at the same time remaining politically and financially viable in the long term?
- How can rural mobility approaches support an environmentally friendly transition, while improving access to opportunities, services and activities?
- What financial models are most suited to supporting environmentally friendly rural mobility approaches?

A number of organizations provide information, resources, and grant funding relating to mobility innovation, including:

- U.S. Department of Transportation: https://www.transportation.gov/priorities/transformation
    - FTA's Research and Innovation work: https://www.transit.dot.gov/research-innovation
        - Accelerating Innovative Mobility: https://www.transit.dot.gov/AIM
        - Enhancing Mobility Innovation: https://www.transit.dot.gov/research-innovation/enhancing-mobility-innovation
        - Integrated Mobility Innovation: https://www.transit.dot.gov/IMI
    - Strengthening Mobility and Revolutionizing Transportation (SMART) Grants Program: https://www.transportation.gov/grants/SMART
    - Advanced Research Projects Agency – Infrastructure (ARPA-I): https://www.transportation.gov/arpa-i
    - University Transportation Centers (which conduct research, technical assistance, and workforce development on a wide variety of issues relating to mobility innovation): https://www.transportation.gov/content/university-transportation-centers
- Shared-Use Mobility Center's Mobility Innovation Collaborative: https://sumcmic.org/
- International Transport Forum
    - Innovations for Better Rural Mobility (2021): https://www.itf-oecd.org/innovations-better-rural-mobility
- Mobility Innovation Lab, Rocky Mountain Institute: https://rmi.org/our-work/transportation/mobility-innovation-lab/
- Michigan Department of Transportation: https://www.michigan.gov/mdot/travel/mobility/initiatives
- Office of Future Mobility and Electrification, Michigan Economic Development Corporation: https://www.michiganbusiness.org/ofme/

2.2 Transit Coordination

Mobility innovation is often facilitated by strong organizational partnerships and governance structures, which are more capable of pursuing new funding and service strategies. One of the ways to achieve this institutional capacity is through coordination among existing service providers, such as those that may be present in a community or across a region for public transportation. In other words, transit coordination can be an important strategy to support mobility innovation. In addition, transit coordination, cooperation, and consolidation efforts (MNDOT 2013), offer significant benefits in their own right (Cook, Lawrie, and Henry 2003) for:

- Riders via more efficient and effective services, consistent fares, and centralized information
- Transit providers via reduced overlap and duplication of efforts, improved scheduling, and economies of schedule
- Regional planners via support for comprehensive regional planning and coordination with land use plans
- State DOTs via reduced administrative burdens and more resources for technical assistance

Transit coordination entails a common set of planning, marketing, and/or service development efforts and the shared organization of routes, frequencies, timetables, fares, and/or ticketing, which facilitate more seamless journeys and create overall positive enhancements to the quality of services (Rivasplata, Iseki, and Smith 2023).

The following resources provide helpful information about public transportation coordination, cooperation, and consolidation efforts, especially in rural areas:

- Cook, T., Lawrie, J., & Henry, A. (2003). From Rural Single-County to Multicounty Regional Transit Systems: Benefits of Consolidation. *Transportation Research Record: Journal of the Transportation Research Board*, 1841(1), 54-61
- Rivasplata, C., Iseki, H., and Smith, A. (2012). Transit Coordination in the US: A Survey of Current Practice. *Journal of Public Transportation*, 15(1), 4
- Minnesota Department of Transportation
    - Guidance for Coordination, Cooperation, and Consolidation (2013): https://www.dot.state.mn.us/transit/transit-for-our-future/docs/guidance-for-coordination-cooperation-consolidation.pdf
- Monahan, P., High, W., Gandhi, A., and Krull, L. (2017). Consolidation of Rural Public Transportation Services. Contractor's Report and Guidebook for NCHRP Project 20-65, Task 69: https://apps.trb.org/cmsfeed/TRBNetProjectDisplay.asp?ProjectID=4158

2.3 Fixed and Flexible Transit

Mobility innovation has had important impacts for public transportation services in recent years, and one of these impacts relates to the distinction between fixed and flexible transit. Rural communities have often had limited transit service options, such as low-performing, circuitous coverage-based fixed route bus loops, and low-performing, relatively inconvenient (i.e., based on advance phone reservations) Dial-a-Ride demand response flexible bus services. However, recent advancements in information and communication technologies have enabled a new approach to rural transit service called microtransit that features the convenience and quality of on-demand mobility. Rural communities now have a wider set of transit service approaches to choose from, and the planning process can ensure that the selection of service design is well-informed by data about needs and gaps as well as public involvement.

In June 2023, the NADO Research Foundation convened a virtual roundtable on microtransit, featuring presentations from practitioners, researchers, and platform vendors. Presentation slides and recordings are archived online: https://ruraltransportation.org/microtransit-roundtable/. In addition, the Transit Cooperative Research Program has a synthesis project underway focused on *Microtransit Solutions in Rural Communities: On-Demand Alternatives to Dial-a-Ride Services and Unproductive Coverage Routes* that should be completed within the next year: https://onlinepubs.trb.org/onlinepubs/tcrp/docs/TCRP_FY2023_Synthesis_Topics.pdf.

The following resources provide helpful information about public transportation service models, especially in rural areas, as well as planning processes to inform service design selection:

- Volinski, J. (2019). Microtransit or General Public Demand Response Transit Services: State of the Practice. TCRP Synthesis 141. Transit Cooperative Research Program, Transportation Research Board. Available online: https://www.trb.org/Main/Blurbs/178931.aspx
- National Rural Transit Assistance Program. (2020). What is Microtransit and How Can It Help Rural Mobility. Webinar on November 18, 2020. Available online: https://www.youtube.com/watch?v=PAY7dp2jg0E
- National Rural Transit Assistance Program. (2021). Rural Transit Service Planning in the Time of COVID and Beyond. Webinar on January 14, 2021. Available online: https://www.youtube.com/watch?v=ALCgkmKcofM

- National Rural Transit Assistance Program. (2021). Rural Transit Service Planning and Route Design. Webinar on September 14, 2021. Available online: https://www.youtube.com/watch?v=6LG8I4gKWLI&t=1s
- Horne, J., and Duke, L. (2021). What is Microtransit? White Paper, FourSquare ITP. Available online: https://www.foursquareitp.com/whitepapers/what-is-microtransit/
- Shared-Use Mobility Center's Mobility Learning Center: https://learn.sharedusemobilitycenter.org
- Schank, J., and Huang, E. (2022). Microtransit: A Good Idea Just Got Even Better. Project 2249, Mineta Transport Institute, San Jose State University. Available online: https://transweb.sjsu.edu/press/Microtransit-Good-Idea-Just-Got-Even-Better
- Transportation Planning Capacity Building Program. (2018). The Transportation Planning Process Briefing Book. Federal Highway Administration and Federal Transit Administration, U.S. Department of Transportation. Available online: https://rosap.ntl.bts.gov/view/dot/43546
- National Rural Transit Assistance Program. (2022). Transit Manager's Toolkit. National Rural Transit Assistance Program. Available online: https://www.nationalrtap.org/Toolkits/Transit-Managers-Toolkit/Welcome-Transit

2.4 Parking and Curbside Management

Parking and curbside management have important impacts on the travel environment and have the capacity to function as both a type and facilitator of mobility innovation. Increasing attention is being given to the tradeoffs associated with traditional postwar approaches to parking in the U.S., and more communities are considering new approaches (see, e.g., Litman 2023, Manville 2023, Mukahhal, Henson, Walker, and Swirsky 2023). New approaches to managing parking and curbside space tend to leverage real-time data to more optimally serve users as well as the greater community (NCHRP 2022), and include strategies for pricing, prioritization of uses, and the allocation of space (Litman 2023).

There is a plethora of resources on parking and curbside management. The following list may provide a helpful starting point for learning more about the issues:

- Parking Reform Network: https://parkingreform.org/
- Litman, T. (2023). Parking Management: Comprehensive Implementation Guide. Victoria Transport Policy Institute. Available online: https://www.vtpi.org/park_man_comp.pdf
- Litman, T. (2023). Comprehensive Parking Supply, Cost, and Pricing Analysis. Victoria Transport Policy Institute. Available online: https://www.vtpi.org/pscp.pdf
- Manville, M. (2023). ACSP Distinguished Educator, 2017: Donald Shoup. *Journal of Planning Education and Research*, 43(1), 212-214
- Mitman, M., Rixey, A., Gibler, T., Howell, A., Swift, T., Weinberger, R., Primus, J., and Abel, S. (2022). Dynamic Curbside Management: Keeping Pace with New and Emerging Mobility and Technology in the Public Right-of-Way. Web-Only Document 340, National Cooperative Highway Research Program, Transportation Research Board. Available online: https://www.trb.org/Publications/Blurbs/182823.aspx
- Franco, S. (2020). Parking Prices and Availability, Mode Choice and Urban Form. Discussion Paper, International Transport Forum. Available online: https://www.itf-oecd.org/parking-prices-and-availability-mode-choice-and-urban-form-0
- Kaufman, M., Formanack, M., Gray, J., and Weinberger, R. (2012). Contemporary Approaches to Parking Pricing: A Primer. Federal Highway Administration, U.S. Department of Transportation. Available online: https://ops.fhwa.dot.gov/publications/fhwahop12026/

- Mukahhal, A., Henson, J., Walker, J., and Swirsky, K. (2023). Car Dependency Starts in the Parking Lot. Kittelson & Associates. Available online: https://www.kittelson.com/ideas/car-dependency-starts-in-the-parking-lot/

2.5 Shared Mobility

Shared mobility programs and services have been an important contributor to mobility innovation in recent years, and there are an increasing number of case studies in rural communities. As summarized by the Shared-Use Mobility Center (SUMC 2023b), the sharing of transportation assets has been enabled by advances in electronic and wireless technologies and motivated by renewed and growing commitments to sustainable transportation and reduced energy use and environmental impacts; shared mobility has drawn interest and support from automobile manufacturers, rental car companies, entrepreneurs, and public officials interested in trying new solutions to routing, pooling, pricing, and collecting and sharing of information (SUMC 2023b). As summarized by SUMC, the benefits of shared mobility include:

- More mobility choices, equitable access to opportunities, and options for carless individuals and households and persons with limited physical ability
- Improved first mile/last mile options and efficiency
- Reduced traffic congestion, pollution, and travel costs (SUMC 2023b)

SUMC organizes shared mobility modally into the following typology:

- Public transportation
- Micromobility (e.g., sharing bikes or scooters)
- Automobile-based (sharing cars, hailing rides)
- Commute-based (sharing cars or vans for commuting) (SUMC 2023b)

The following resources provide helpful information about shared mobility, especially in rural settings:

- Shared-Use Mobility Center's Mobility Learning Center: https://learn.sharedusemobilitycenter.org
- Rodier, C., and Podolsky, L. (2020). Shared-Use Mobility Services Can Improve Access and Reduce Costs in Rural Disadvantaged Communities. National Center for Sustainable Transportation, University of California, Davis. Available online: https://ncst.ucdavis.edu/project/scs-implementation-alternatives-meeting-transit-needs-rural-san-joaquin-valley
- Rodier, C., Harold, B., and Zhang, Y. (2022). Evaluating Pilot Approaches to Increase Rural Mobility. National Center for Sustainable Transportation, University of California, Davis. Available online: https://ncst.ucdavis.edu/project/before-and-after-evaluation-shared-mobility-projects-san-joaquin-valley
- National Association of City Transportation Officials. (2022). Half a Billion Trips: On Shared Micromobility Since 2010. National Association of City Transportation Officials. Available online: https://nacto.org/shared-micromobility-2020-2021/
- National Association of City Transportation Officials. (2022). Shared Micromobility Permitting, Process, and Participation. Urban Bikeway Design Guide Working Paper, National Association of City Transportation Officials. Available online: https://nacto.org/shared-micromobility-working-paper/
- Litman, T. (2019). Shared Mobility Services: Public Transit, Ridehailing, Carsharing, Ridesharing and Bikesharing. TDM Encyclopedia, Victoria Transport Policy Institute. Available online: https://www.vtpi.org/tdm/tdm134.htm

- Litman, T. (2021). New Mobilities: Smart Planning for Emerging Transportation Technologies. Island Press. Available online: https://islandpress.org/books/new-mobilities

2.6 Active Transportation

Active transportation is an important contributor to many forms of mobility innovation, and overlaps with other concepts discussed in this section, including public transportation and shared mobility. For example, walking and bicycling are important modes for getting to and from public transportation stops and stations, and shared mobility has been an important way to introduce active transportation to new user groups and build demand and constituencies for improved services and built environment conditions (e.g., sidewalks and protected bike lanes). In many cases, bikesharing and scootersharing programs are the first exposure riders have to ebikes and escooters. Mobility innovation around shared micromobility has been an important contributor to increased rates of active transportation, and physical activity rates across the community. Renewed interest in active transportation has been accompanied by increased commitments to safe infrastructure for non-motorists. In recent years, growing attention has been given to sidewalk master planning and the implementation of safe accommodations for pedestrians and bicyclists during roadway construction. Winter maintenance of active transportation facilities is also receiving increasing attention.

The following organizations and resources provide helpful information about active transportation, and related planning considerations and issues:

- Pedestrian and Bicycle Information Center: https://www.pedbikeinfo.org/
- National Association of City Transportation Officials: https://nacto.org/
    - Urban Street Design Guide
    - Global Street Design Guide
    - Urban Bikeway Design Guide
    - Transit Street Design Guide
    - Urban Street Stormwater Guide
    - Blueprint for Autonomous Urbanism
    - Bike Share Station Siting Guide
    - Don't Give Up at the Intersection: Designing All Ages and Abilities Bicycle Crossings
    - Designing for All Ages and Abilities: Contextual Guidance for High-Comfort Bicycle Facilities

- Litman, T. (2023). Active Transportation Policy Issues: Backgrounder. Victoria Transport Policy Institute. Available online: https://www.vtpi.org/act_tran.pdf
- Litman, T. (2023). Evaluating Active Transport Benefits and Costs: Guide to Valuing Walking and Cycling Improvements and Encouragement Programs. Victoria Transport Policy Institute. Available online: https://www.vtpi.org/nmt-tdm.pdf
- Buehler, R., and Pucher, J. (Eds.) (2021). Cycling for Sustainable Cities. MIT Press. Available online: https://mitpress.mit.edu/9780262542029/cycling-for-sustainable-cities/

2.7 Rural Community Design and Placemaking

Mobility innovation has the potential to both contribute to and be impacted by community design and placemaking efforts. Rural placemaking refers to "a wrap-around approach to community and economic development that incorporates creativity, infrastructure initiatives, and vibrant public spaces" via "a collaborative engagement process that helps leaders from rural communities

create quality places where people will want to live, work, visit and learn" (USDA Rural Development 2023). The USDA and the National Endowment for the Arts ("NEA") have been leading supporters of placemaking through grant programs, the development of resources, and the hosting of conferences.

Rural placemaking is aligned with the alternative approaches to community and economic development that have emerged in recent decades, which have broadened development efforts beyond traditional economic activities to include social, cultural, and environmental activities as well. These alternative frameworks tend to place a greater emphasis on measures such as quality of life and sense of place (see, e.g., Wyckoff, Neumann, Pape, and Schindler 2015, Weinstein, Hicks, and Wornell 2020).

The following resources may serve as a helpful starting point for familiarizing with rural placemaking and community design:

- U.S. Department of Agriculture and the University of Kentucky's Community & Economic Development Initiative of Kentucky
  - Rural America Placemaking Toolkit: https://www.ruralplacemaking.com/
  - 2022 and 2023 Placemaking in Small & Rural Communities Conferences: https://www.rd.usda.gov/placemaking and https://cedik.ca.uky.edu/placemaking-conference
- National Endowment for the Arts
  - Our Town creative placemaking grants: https://www.arts.gov/grants/our-town
  - Citizens Institute on Rural Design: https://www.arts.gov/initiatives/cird
  - Creative Placemaking: https://www.arts.gov/impact/creative-placemaking
- Project for Public Spaces: https://www.pps.org/article/what-is-placemaking
- Wyckoff, M., Neumann, B., Pape, G., and Schindler, K. (2015). Placemaking as an Economic Development Tool: A Placemaking Guidebook. Land Policy Institute, Michigan State University. Available online: https://www.canr.msu.edu/resources/pmedtguidebook
- Whittaker, J., Bamford, T., Carr, J., Elmer Hough, P., Lapping, M., Nabity, C., and Seeley, L. (2020). Lessons in New Ruralism. The New Ruralism Initiative, American Planning Association. Available online: https://nne.planning.org/sections/maine/front-page/new-ruralism-initiative-sharing-stories-new-ruralism/

3 Existing Conditions

This section provides an overview of the existing conditions in Houghton County, with an emphasis on transportation, economic issues, and community health.

3.1 Sociodemographic, Economic, and Health Indicators

Houghton County is located along the Keweenaw Peninsula and shores of Lake Superior in Michigan's Upper Peninsula and has an area of 1,009.1 square miles (Census Bureau 2023a). The predominantly rural county had a 2020 Decennial population count of 37,361, compared to a population count of 36,628 for the 2010 Decennial Census – representing an increase in population of 733, or about 2%, between 2010 and 2020 (Census Bureau 2023a). The per capita ($27,087) and median household ($48,623) incomes in Houghton County are below the Michigan state averages ($34,768 and $63,202, respectively), while the share of people in poverty (17.2%) is above the Michigan average (13.3%) (Headwaters Economics 2022a). The annual unemployment rate in Houghton County was 4.8% in 2022, which was also above Michigan's rate of 4.2% (Headwaters Economics 2023b). The share of people with disabilities is 11.7% in Houghton County, compared to 14.1% for Michigan overall (Headwaters Economics 2023c). More

people are without health insurance (7.6%) in Houghton County, compared to in Michigan (5.3%) overall (Headwaters Economics 2023c).

In terms of transportation, approximately 9.7% of households in Houghton County have no private vehicle, compared to 7.3% for Michigan overall (Headwaters Economics 2023c). Access to a car has important impacts on earnings and financial stability, as well as measurable benefits for those receiving public assistance and during emergencies and extreme weather (Headwaters Economics 2023c). Living in most U.S. communities without a car is challenging, and relates to what King, Smart, and Manville (2022) called "the poverty of the carless" (see also, e.g., Klein 2020, Coren, Lowe, and Barajas 2022, and Klein, Basu, and Smart 2023).

The personal income outflow of earnings from Houghton County has significantly increased in recent decades, from $32,897 in 1990 to $74,354 in 2010 and $91,607 in 2021 (for an increase of about 178% between 1990 and 2021) (Headwaters Economics 2023d). During that time period, personal income inflow of earnings to Houghton County has also increased, from $41,156 in 1990 to $60,703 in 2010 and $73,715 in 2021 (for an increase of about 79% between 1990 and 2021) (Headwaters Economics 2023d). This has led to a net residential adjustment (inflow minus outflow) of -$17,891 in 2021, which indicates the county is able to attract workers from nearby areas (Headwaters Economics 2023d). As summarized in Figure 2, the U.S. Census Bureau's OnTheMap Inflow/Outflow Analysis indicates that 77.2% of workers employed in Houghton County are also residents (a count of 8,588), while only 28.2% of workers living in Houghton County work elsewhere (a count of 3,378) (Census Bureau 2023b). Overall, these flows suggest that Houghton County is attracting workers from neighboring counties and that most of its working residents do not need to commute to neighboring counties.

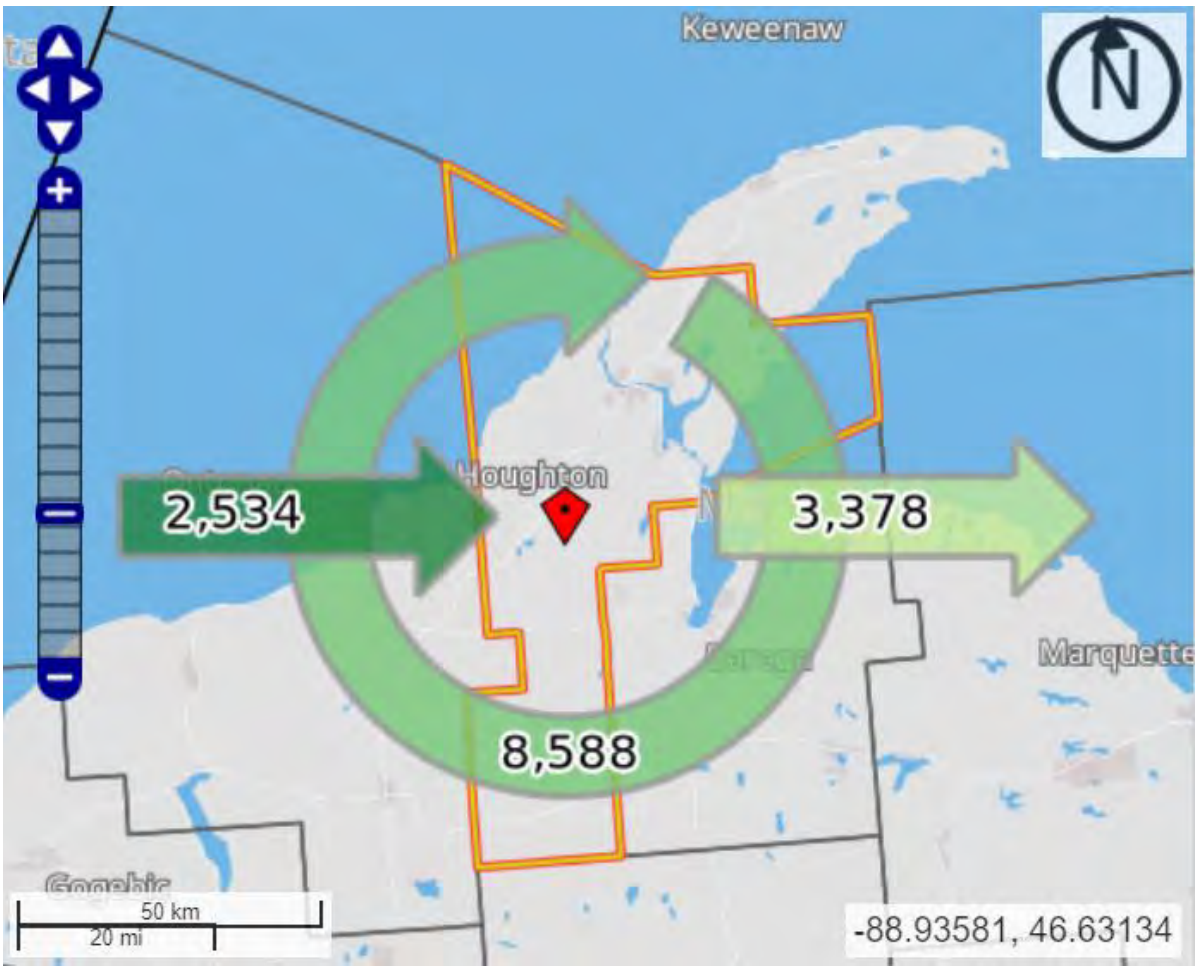

Figure 2. Inflow/Outflow Analysis for Houghton County (2020, All Jobs, Workers Home)
Source: Image generated by the OnTheMap webtool from the U.S. Census Bureau, using the Inflow/Outflow Analysis for all jobs in 2020 based on where workers live (Census Bureau 2023b).

The cities of Houghton and Hancock are the largest cities in Houghton County, with population counts in the 2020 Decennial Census of 8,386 and 4,501 respectively. Michigan Technological University (MTU) is located within Houghton and is a major employer and trip generator for the area. In the Fall of 2022, there were a combined total of 7,074 full- and part-time undergraduate and graduate students, and 1,580 non-student employees (MTU 2023).

3.2 Community Surveys

The 2021 Upper Peninsula Community Health Needs Assessment reported on health indicators for randomly sampled residents of Houghton and Keweenaw counties, and reported that 9.6% of these residents were unable to access healthcare due to cost (compared to 7.9% for the state as a whole); when taking household income into account, 13.0% of these residents in households earning less than $25,000 were unable to access healthcare due to cost, compared to only 3.9% for those in households earning more than $50,000 (WUPHD 2021, p. 440).

In 2022, a Quality-of-Life Survey was given to the City of Houghton residents as part of its Master Plan Update process. A minority of respondents agreed or strongly agreed that roads (38.9%), sidewalks (33.2%), and bike paths (41.0%) are well maintained, and a minority of residents

agreed or strongly agreed that roads (23.6%), sidewalks (34.8%), and bike paths (39.9%) are in good condition. Only 37.4% of residents agreed or strongly agreed that there were enough sidewalks in their area of the city (City of Houghton 2022, p. 20). Most of the respondents to the survey had never used public transportation (86.4%) or carpooling (70.4%) for commuting. In contrast, 66% of respondents used personal vehicles daily for commuting, while 28.4% used walking or bicycling daily for commuting (City of Houghton 2022, p. 21). Most respondents who used the public bus service reported being somewhat or extremely satisfied with the frequency of service (80.6%) and fares (85.9%) (City of Houghton 2022, p. 22). The top reason for never having used the public bus service was that stops (or locations) were not convenient (City of Houghton 2022, p. 23). Electric vehicle charging stations were considered a somewhat or extremely important sustainable practice by 56.9% of respondents, but this issue ranked lower than other sustainable practices listed (including recycling, clean-ups, and yard waste drop-offs) (City of Houghton 2022, p. 28). Only 43.5% of respondents were somewhat or extremely satisfied with parking enforcement, and only 47.2% of respondents were somewhat or extremely satisfied with downtown parking decks (City of Houghton 2022, p. 31, 34). Most (55%) respondents thought the best use of the property formerly occupied by the downtown parking deck would be mixed use, compared to only 21.2% who thought the best use would be public parking (City of Houghton 2022, p. 36). Finally, the most popular suggestions offered by respondents included accessibility, enforcement of speed limits, and sidewalks and roads (City of Houghton 2022, p. 39).

3.3 Planning Document Review

In preparation for this technical assistance effort and to become familiar with the economy, demographics, goals, environment, and transportation landscape of the service area, the research team reviewed available planning documents from local entities including WUPPDR, the City of Houghton, the City of Hancock, Michigan Technological University, and the Michigan Department of Transportation. Specific documents reviewed by the research team included:

- 2017-2022 WUPPDR Comprehensive Economic Development Strategy
- 2015-2019 WUPPDR Regional Prosperity Plan
- 2015 WUPPDR Regional Transit Mobility Report
- 2007 WUPPDR US 41/M 26 Highway Corridor Access Management Plan
- 2007 City of Houghton Bicycle Plan
- 2013 City of Houghton Non-Motorized Transportation Plan
- 2020 City of Houghton Downtown Parking Analysis
- 2019-2023 City of Houghton Master Plan
- 2018 City of Hancock Master Plan
- 2017-2021 City of Hancock Non-Motorized Transportation Network Plan
- 2016 Michigan DOT Coordinated Mobility Plan - Prosperity Region 1
- 2011 Michigan DOT Coordinated Human Services Public Transit Plan and Accessibility Study
- 2009 Michigan DOT Superior Region Non-Motorized Transportation Plan & Investment Strategy
- 2021 Michigan Technological University Master Plan
- 2021 Michigan Technological University Commuter Survey Summary

Other reports, memos, maps, and documents were supplied by the project partners for review as well and served to help inform the project activities described in this report.

3.4 Existing Transit Services

As outlined in the 2011 Coordinated Human Services - Public Transit Plan and Accessibility Study, and more recently on the Get Around the Western U.P. website (https://www.getaroundwup.org/) - twelve transit providers operate in or around the cities of Houghton and Hancock in Houghton County. Of these providers, three key partners have been engaged in the activities outlined in this report: Houghton Public Transit, Hancock Public Transit and Michigan Technological University.

Houghton Public Transit is operated by the City of Houghton and provides both fixed route and on-demand transit service to local residents. Houghton offers a Downtowner Route that provides access to local shopping and amenities, as well as a City Commuter Shuttle. The City Commuter Shuttle only operates during the MTU school year and is free to MTU students, faculty, and staff. On-demand services are available Monday through Friday 7am to 5pm on a call ahead basis. Information on transportation services is available on the City of Houghton website at: https://www.cityofhoughton.com/transportation/.

Hancock Public Transit is operated by the City of Hancock and provides on demand service to locations in Hancock and Houghton. Riders call ahead to request rides and service is available 7am to 5pm Monday through Friday. Same day requests for rides can typically be honored. Additional information is available on the City of Hancock website at: https://www.cityofhancock.com/info-transit.php.

Michigan Technological University also offers transportation services for students and staff during the fall and spring semesters of the school year. These services provide access to locations across the MTU campus and the greater Houghton area. Three main service routes are offered: Husky Campus Shuttle, City Commuter Shuttle, and the Hancock Commuter Shuttle. Detailed information on MTU supported transportation services, including live tracking of shuttle vehicles is available on the college website at: https://www.mtu.edu/transportation/options/shuttle/.

It is important to note that these transit systems serve many of the same origins and destinations in the greater Houghton/ Hancock community, and in some cases operate congruently and concurrently to each other.

4 Project Activities and Outcomes

This section summarizes key project activities undertaken over the course of this technical assistance project.

4.1 Six-Part Multimodal Transportation Webinar Series

One of the key envisioned elements of this project was the convening of a mobility innovation working group. Due to challenges related to limited core stakeholder availability, we pivoted our relationship-building technical assistance efforts to support learning by convening an informational and educational six-part webinar series on a diverse array of multimodal transportation topics, featuring local practitioners as well as national experts. Each session lasted 60-90 minutes, and the topics, dates, and presenters featured in the series are summarized in Table 1. The series featured a combined total of 20 informational presentations, and each session included time for discussion with the featured presenters.

Table 1. Overview of the Project's Six-Part Webinar Series

Session 1: Transit Cooperation, Coordination, and Consolidation (October 26th, 2022)

Speaker 1: Andrea Hamre, WTI – Overview of Transit Cooperation, Coordination, & Consolidation

Speaker 2: David Kack, WTI – Case Study of Town-University Transit (Bozeman's Streamline Bus)

Speaker 3: Bret Allphin, NADO RF – Route Analysis for a Consolidated System (Initial Results)

Speaker 4: Jeff Hazen, Sunset Empire Transportation District* – Collaborative Partnerships to Address Transit Driver Shortages & Support Transit Workforce Development (Oregon's Pilot with Returning Citizens)

*Note: Emergency circumstances prevented Mr. Hazen from presenting.

Session 2: Best Practices in Fixed and Flexible Rural and Small Urban Transit Services (November 30th, 2022)

Speaker 1: Ken Hosen, KFH Group – Doing More with Less or Doing Less with More – Improving Transit on the Upper Peninsula

Speaker 2: Dave Marsh, CARTS (Capital Area Rural Transportation System)* – Overview of CARTS and Review of CARTS Microtransit Pilot Project

*Note: Emergency circumstances arose that caused Mr. Marsh to fill in for Dana Platt.

Speaker 3: Mimi Hutchinson, Champaign County Regional Planning Commission – Challenges and Best Practices in the COVID-19 Era – Champaign County Area Rural Transit System (C-CARTS)

Speaker 4: Andrea Hamre, WTI – Overview of Microtransit

Session 3: Innovative Practices for Parking and Curbside Management (January 4th, 2023)

Speaker 1: Travis Liska, North Central Texas Council of Governments – Parking Smarter – Parking Management for Walkable Places

Speaker 2: Bret Allphin, NADO RF – Downtown Parking Inventory – Small Town Challenges

Speaker 3: Rebecca Gleason, WTI – Rural Recreational Trail Access to Alleviate Trailhead Parking Congestion – Bozeman's Trail to the M

Speaker 4: Brian Davis, Studio Davis Planning – Main Street Parking in a Nutshell

Speaker 5: Andrea Hamre, WTI – Parking and Curbside Management & Technology

Session 4: Best Practices in Shared Mobility Services for Rural and Small Urban Areas (January 25th, 2023)

Speaker 1: Ranjit Godavarthy, Upper Great Plains Transportation Institute – Research Insights on Shared Mobility in Rural Settings

Speaker 2: Rudy Faust, Shared Use Mobility Center – Insights from Technical Assistance Projects and Resources for Shared Mobility Planning

Speaker 3: Andrea Hamre, WTI – Additional Resources on Shared Use Mobility

Session 5: Active Transportation Planning for Rural and Small Urban Areas (February 22nd, 2023)

Speaker 1: Nicholas Ross, City of Bozeman – Vision Zero and Bozeman's SAFE (Streets Are For Everyone) Plan
Speaker 2: Todd Litman, Victoria Transport Policy Institute – Responding to Changing Travel Demands & Community Goals
Speaker 3: Andrea Hamre, WTI – Policy Trends, Data Collection & Seasonal Considerations for Active Transportation Planning

Session 6: Commuting Action Planning and Funding (March 29th, 2023)

Speaker 1: Mikey Goralnik, Mariposa County – Mariposa Creek Parkway
Speaker 2: Bret Allphin, NADO RF – Transit Programming Match & In-Kind Plus Additional Resources
Note: This session also included significant discussion surrounding creative and rural placemaking and design.

4.2 Local and Regional Transit Service Analyses

Identified in the scope of work and based upon numerous conversations with partners and stakeholders during the course of this project, transit services in the greater Houghton/Hancock area were identified as a critical area of concern. Much of this concern stems from the condition of having multiple transit operators providing services in the local area, yet still receiving a message of need for additional or expanded service from residents. As a result of this, a key element of this technical assistance project was to analyze opportunities for multimodal transportation improvements in the greater Houghton/Hancock area. These efforts focused on analyzing existing transit service data and developing conceptual options for future service improvements and expansion. NADO RF Senior Program Manager Bret Allphin led this technical assistance, which focused on two major analyses:

- City of Hancock – Potential Future Transit Options (with initial findings previewed at the Session 1 webinar on October 26th, 2022)
- Houghton County – Countywide Transit Service Modeling (with preliminary findings shared with stakeholders in July 2023)

The City of Hancock Potential Future Transit Options effort was an exercise to explore a scenario in which the City of Hancock provided a fixed route style of transit service to the locations in the communities of Houghton and Hancock. The routes created as part of this exercise reflected existing stop locations in Houghton, and locations identified from demand response service logs provided by the City of Hancock. In these scenarios headway timings and basic cost estimations were provided based on data reported to the National Transit Database by the City of Houghton. A map of the conceptual route serving locations in Houghton and Hancock is provided below in Figure 2. A map illustrating a conceptual route serving all Houghton and Hancock locations plus identified MTU stops is provided in Figure 3. Full methodology, analysis, and findings are included as appendix A to this report.

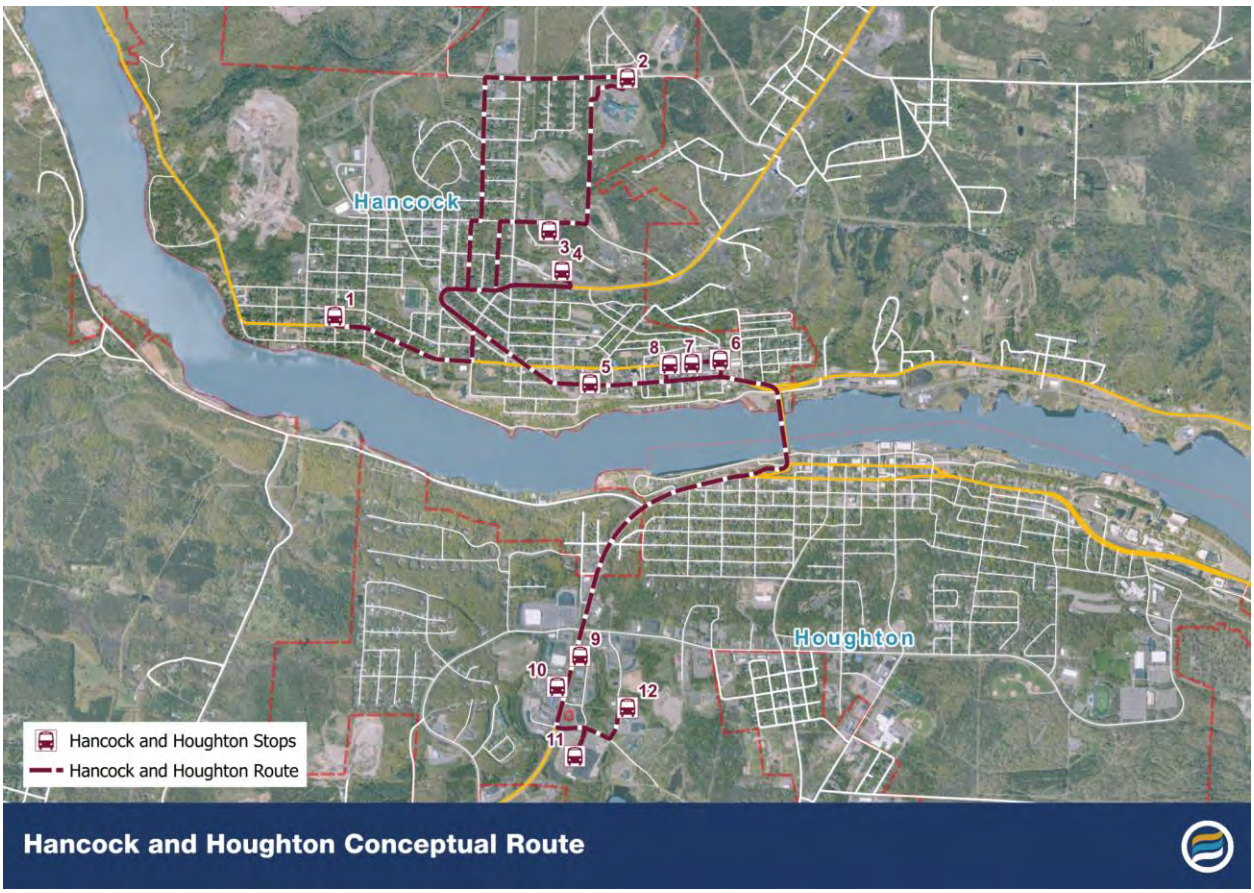

Figure 3. Hancock and Houghton Conceptual Route Map

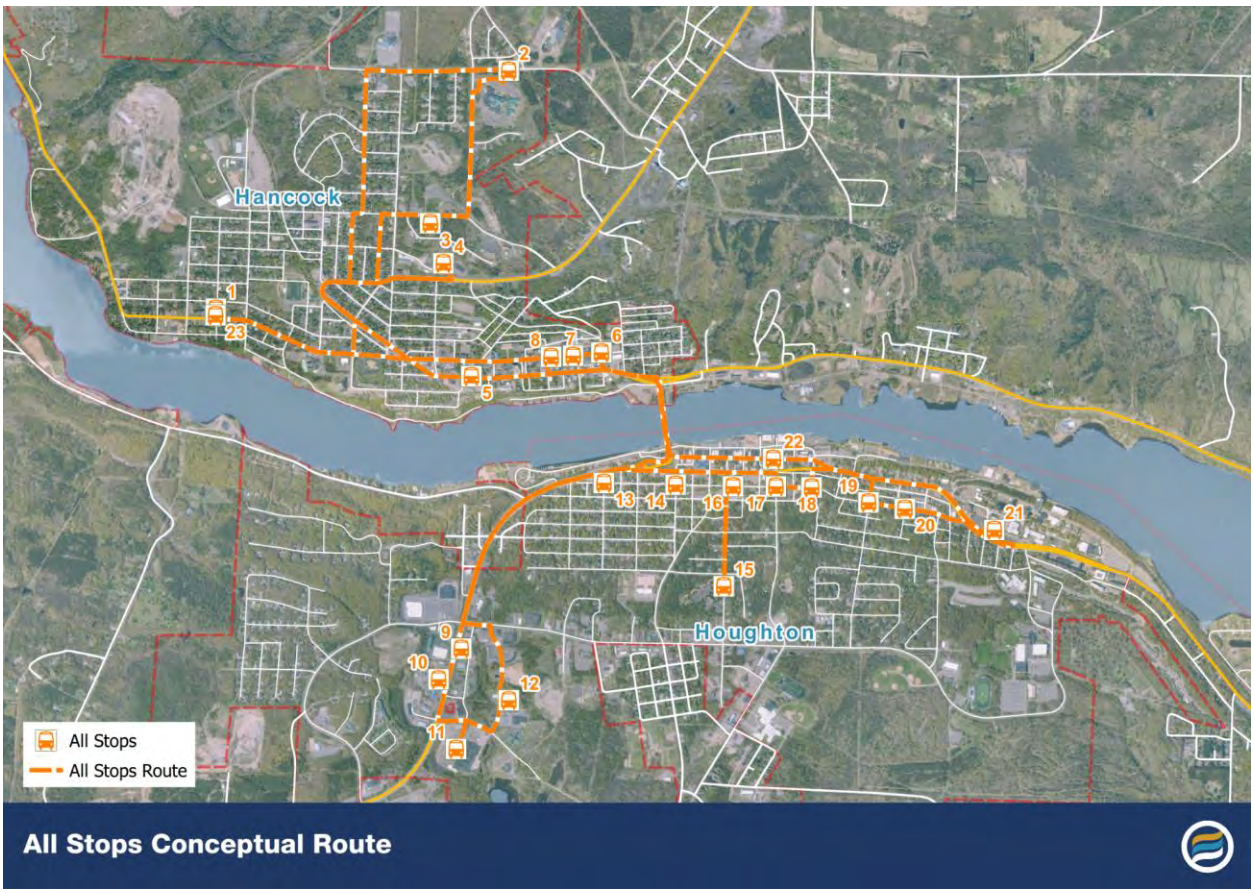

Figure 4. All Stops Conceptual Route Map

Following the exercise examining potential routes in the greater Hancock/Houghton area, conversation continued among project partners and stakeholders regarding other potential transit service expansions and extensions, specifically that could serve individuals commuting to and from MTU. Achieving this goal would require the provision of service to additional locations in Houghton County outside of the Hancock/Houghton area, including the Houghton County Memorial Airport, and locations north including Hubbell, Lake Linden, and Tamarack. Locations south of Hancock/ Houghton were also modeled including Atlantic Range, South Range, Painesdale, Chassell, and areas immediately west of Portage Lake along U.S. Route 41. Maps illustrating the conceptual north and south routes serving these locations in Houghton County are provided below as Figures 5 and 6. Full methodology, analysis, and findings for this countywide effort are included as Appendix B to this report.

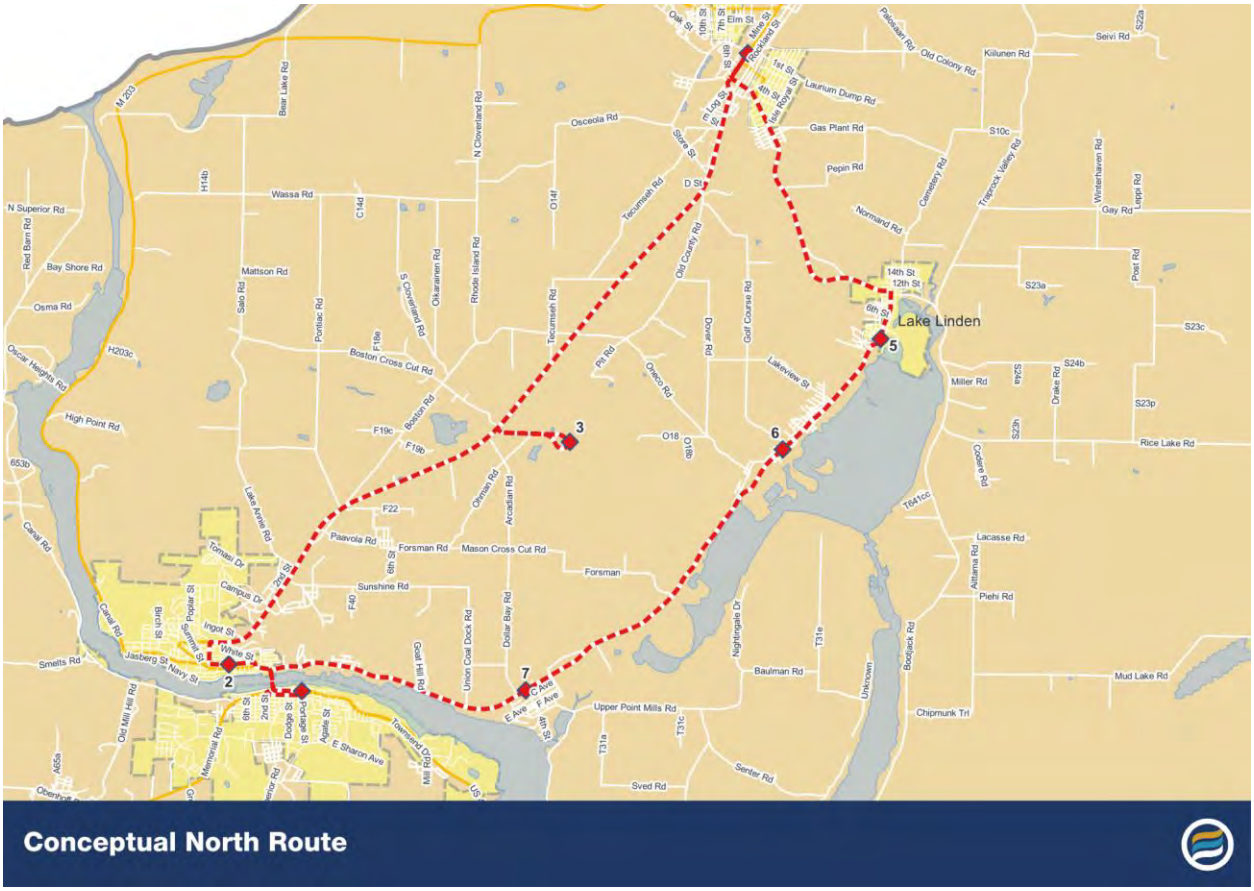

Figure 5. Conceptual North Route Map

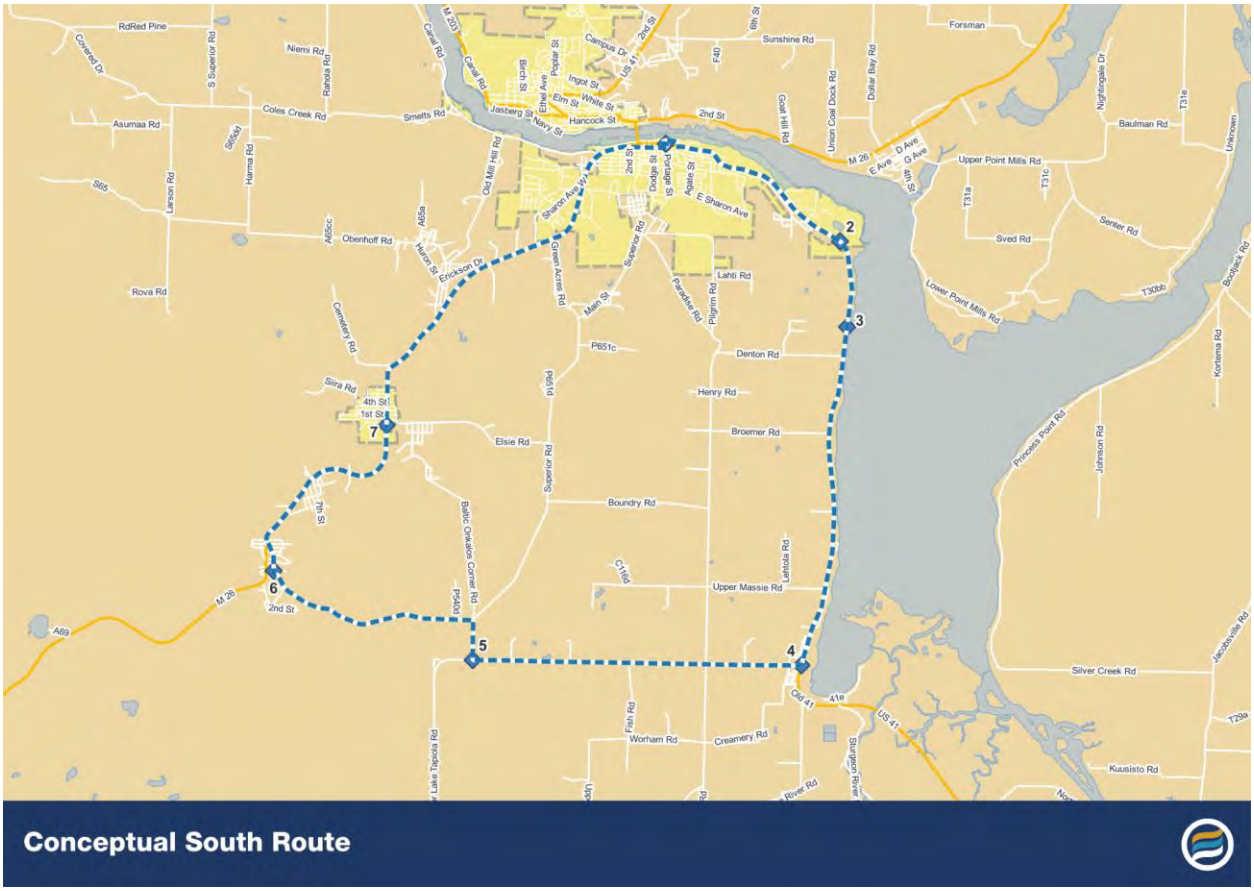

Figure 6. Conceptual South Route Map

Ultimately these analyses and their accompanying data were provided to local partners and stakeholders as a starting point for future conversations regarding transit service expansions in Houghton County and the implications the service may have both for providers and riders.

4.3 Assistance with Transit Consolidation Study Scope of Work

During the course of this project, leadership and transit managers with the City of Houghton and City of Hancock endeavored to pursue state grant funding from the Michigan Department of Transportation for a transit consolidation study. In cooperation with WUPPDR, the research team reviewed and provided feedback on draft language for the state grant application. Once the indication was given that the grant funding would be awarded, the research team met with local stakeholders to discuss the contents of a Request for Proposals and generated sample scope of work and task language for their review and consideration. A draft version of this RFP language is included as Appendix C to this report.

4.4 Parking Analysis

Another opportunity for technical assistance focused on parking concerns in the City of Hancock raised by WUPPDR staff. NADO RF Senior Program Manager Bret Allphin led an analysis of Hancock's parking inventory and current utilization. Parking management has a significant impact on the multimodal travel environment, including safety and comfort for pedestrians and bicyclists as well as transit service efficiency. To understand these impacts, analysis was compiled by NADO RF as part of the speaker series described in a previous section. A map of current and

potential off-street parking in the City of Hancock was produced for the discussion and is included as Figure 7 below. From the presentation discussion, illustrated in the map are 52 existing or potential off-street parking areas. Together these encompass approximately 13.5 acres of parking, totaling an estimated 1,705 parking spaces.

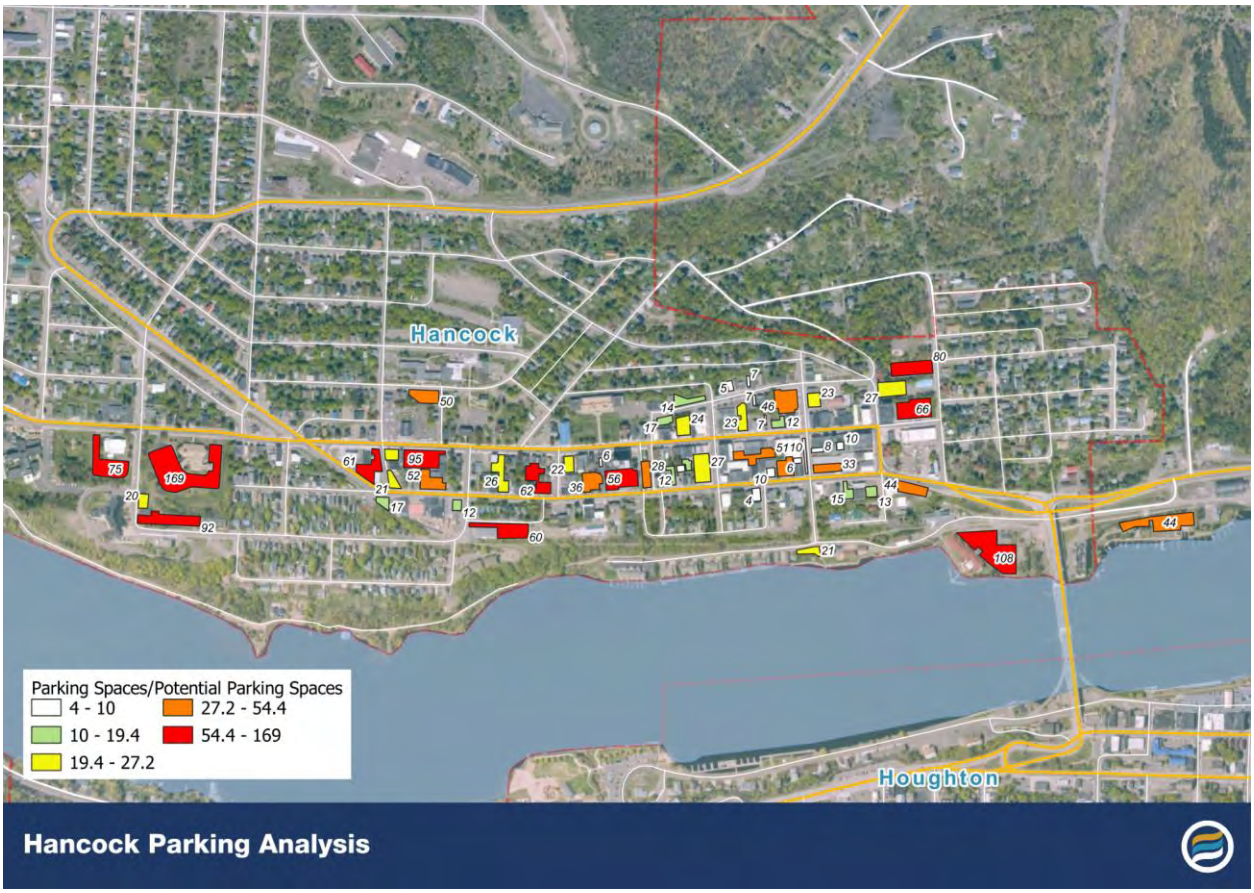

Figure 7. Current and Potential Off-Street Parking, City of Hancock

To illustrate the potential for connectivity improvements in Hancock, the parking map was combined with the conceptual transit stops created as part of the transit modeling activity described earlier and overlaid with five-minute walksheds. The result is illustrated in Figure 8 below.

Figure 8. 5 Minute Walkshed from Potential Transit Stops

4.5 Communication with Project Teams Leading Parallel Transportation Studies

During the course of this project, the research team met and shared information with peer project teams conducting additional studies relating to transportation in and around the Houghton area, including teams for the:

- Region 13 Coordinated Transportation Plan (led by KFH Group)
- City of Hancock Master Plan Update (led by Progressive AE)

4.6 Transit Governance Survey

During the course of this project, the research team developed a survey script to collect information about transit governance models. This effort was led by NADO RF staff. This script and survey is available for deployment at any time, an export of the online form is attached to this report as appendix D. The survey includes 24 questions that gather information about transit organization governance structures including governing boards, memberships, residency requirements, funding, service levels, and related topics.

Of the research identified on this topic, two documents may be of most value in considering the conditions for and impacts of transit consolidation. The San Bernardino document referenced below is an urban system but provides excellent in-depth examples of the number and types of issues that should be assessed when a consolidation action is being considered at any level.

- Transportation Research Board/ AASHTO Standing Committee on Public Transportation. Consolidation of Public Transportation Services Guidebook. (2017). https://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP20-65(69)_Guidebook.pdf.

- San Bernardino County Transportation Authority. Consolidation Study and Innovative Transit Review - Task 1.4B - Evaluation of Functional Areas in a Complete Consolidation. (2020). https://omnitrans.org/wp-content/uploads/2020/08/Item-F2-Attachments-C-F-1.pdf.

5 Recommendations

The following recommendations are based on the results and outcomes of the research team's technical assistance activities and are offered for consideration to support further mobility improvements and innovations in Houghton County.

5.1 Continue to Develop Working Relationships

During this project, key stakeholders and project partners identified the coordination of public transportation services in Houghton County as a priority. We recommend these stakeholders dedicate time to regularly convening a working group on transit service improvements. This would be an opportunity to bring together stakeholders working on public transportation for the Cities of Houghton and Hancock, as well as MTU. The working group could also be a facilitator of peer sharing from across the state. For example, transit leaders in Houghton County may wish to learn more about the Calhoun County Coordinated Mobility Pilot (publicly branded as BCGo: https://www.bcgomi.com/) and the 2020 Calhoun County Transit Study (Foursquare ITP and Monahan Mobility Consulting 2020).

The research team was unable to successfully convene a dedicated transportation innovation group made up of interested stakeholders from across the region. While this may not have been achieved during this project period, the team does believe that this group could still be valuable in identifying future services and service improvements that would benefit local residents. Identifying a local champion who can be the catalyst for this group is central to the establishment of this effort.

5.2 Focus Attention on Transit Workforce Issues

Transit systems throughout the country are facing workforce related challenges, including curtailed or cut service due to labor shortages. During this project, key stakeholders identified that this was a concern for at least some of the transit providers operating in Houghton County. The research team recommends a sustained focus on these workforce issues. The following resources may serve as a helpful starting point for additional learning and information:

- National Rural Transit Assistance Program. (2022). Transit Manager's Toolkit. National Rural Transit Assistance Program. Available online: https://www.nationalrtap.org/Toolkits/Transit-Managers-Toolkit/Welcome-Transit
    - Driver Recruitment, Training, and Retention: https://www.nationalrtap.org/Toolkits/Transit-Managers-Toolkit/Administration/Driver-Recruitment-Training-and-Retention#DriverRecruitmentTrainingandRetention
- TransitCenter

  - TransitCenter. (2023). People First: How a More Strategic Approach to Human Resources Can Help Transit Agencies Attract and Retain the Talent They Need to Run Great Service. TransitCenter. Available online: https://transitcenter.org/new-report-to-solve-workforce-challenges-once-and-for-all-transit-agencies-must-put-people-first/
  - Paget-Seekins, L. (2023). Passionate, Public Service-Oriented People Seeking Healthy, Rewarding Work Environment. January 4, 2023. TransitCenter. Available online: https://transitcenter.org/passionate-public-service-oriented-people-seeking-healthy-rewarding-working-environments/
  - Paget-Seekins, L. (2023). Facilitating Mental Health and Well-Being for the Transit Workforce. January 9, 2023. TransitCenter. Available online: https://transitcenter.org/facilitating-mental-health-and-well-being-for-the-transit-workforce/
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- American Public Transportation Association
  - FoursquareITP and EBP. (2023). Transit Workforce Shortage: Synthesis Report and Toolkit. Prepared for the American Public Transportation Association. Available online: https://www.apta.com/research-technical-resources/research-reports/transit-workforce-shortage/
  - APTA U Workforce Mini Guides: https://learning.aptagateway.com/apta-workforce-mini-guides

5.3 Prioritize Active Transportation Improvements

During the course of this project, our analysis and key stakeholders identified significant challenges across the study area relating to conditions for non-motorists, including unsafe walking and bicycling conditions. The COVID-19 pandemic disrupted some of the community dialogue occurring surrounding active transportation, and we recommend renewed efforts to reconvene stakeholders regarding these issues.

Crash data provided by the Michigan Office of Highway Safety Planning and hosted at www.michigantrafficcrashfacts.org indicates that between 2018 and 2022 there were seven crashes in the Houghton/Hancock area involving bicyclists, as illustrated in Figure 9 below. Figure 10 illustrates that there were five crashes involving pedestrians during the same period.

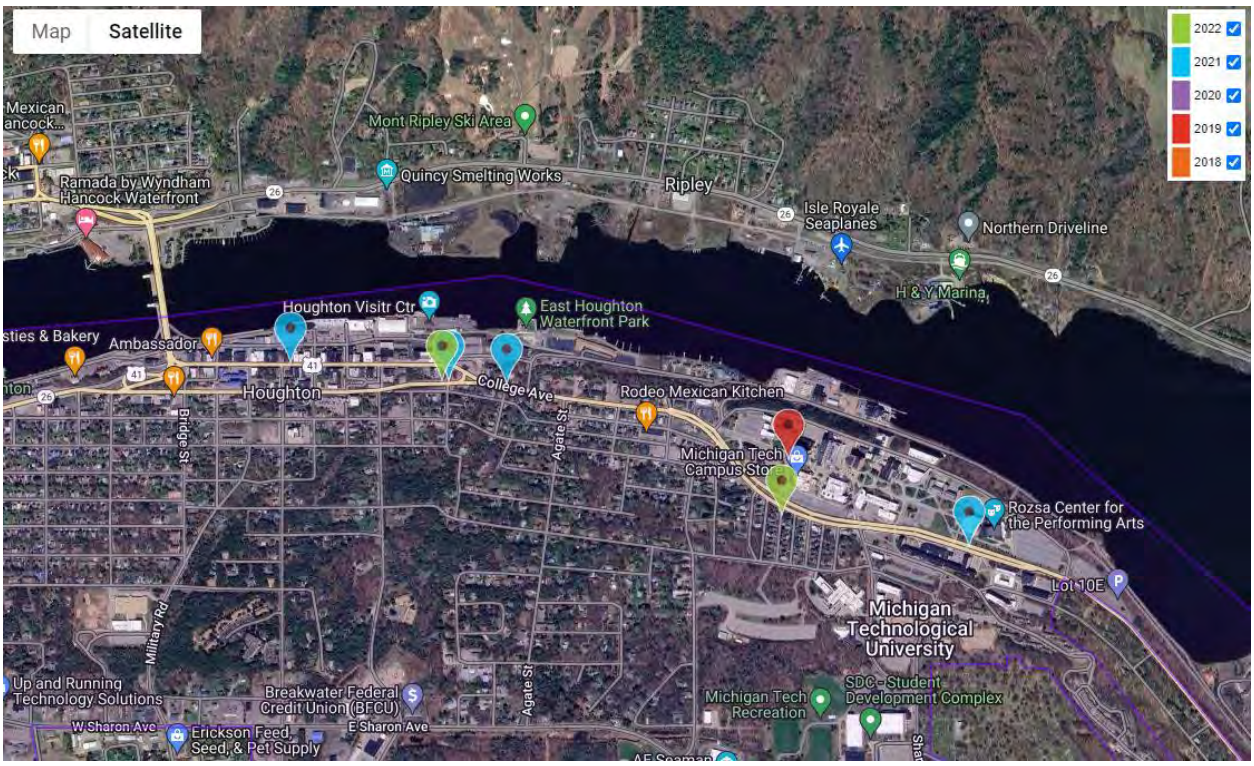

Figure 9. Traffic Crashes Involving Bicyclists, 2018-2022

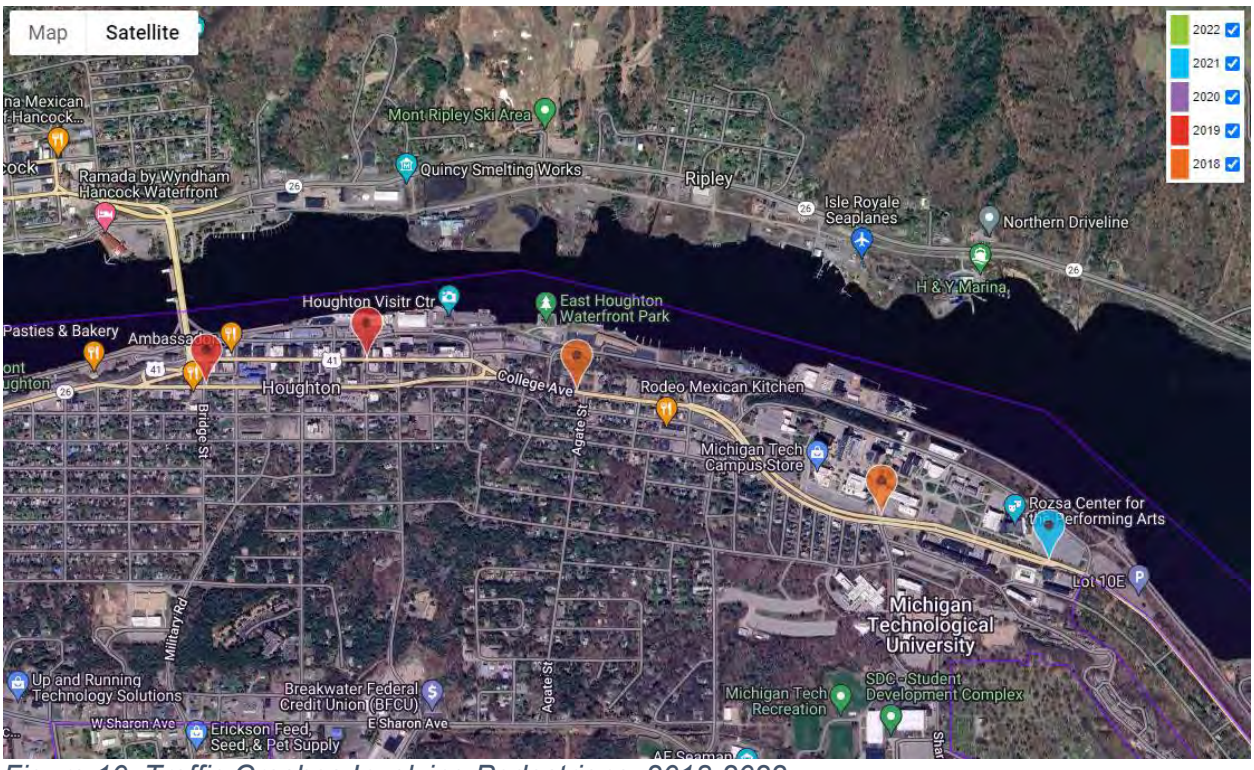

Figure 10. Traffic Crashes Involving Pedestrians, 2018-2022

It is important to note that all crash incidents in both categories were located in the City of Houghton, and in the same general area of downtown and in locations near MTU. No incidents were recorded in the City of Hancock. This does not mean that no incidents took place, only that no incidents required a police report to record the event. To bring attention to these events, efforts like the Houghton County Recreational Authority, and similar bodies that support advocacy for active transportation improvements that create a more safe and equitable transportation environment, should be prioritized. Memorializing these efforts in local and regional planning efforts is also key to formulating future projects that may produce benefits to non-motorized travel conditions in the region.

5.4 Continue to Examine Parking Management Best Practices

The research team also recommends incorporating best practices in parking management into multimodal planning efforts to improve mobility in the core cities of Houghton and Hancock. During the project period, the research team was specifically engaged in conversations regarding parking conditions in the City of Hancock. While the concern over parking issues is not new, the challenges persist. The growing mix of storefront businesses, service organizations, and downtown residential all competing for limited parking resources continues to be a challenge for local leaders. A recently completed parking analysis for the City of Houghton provided valuable information including peak demand times, 'parking adequacy' which indicates a deficit or surplus of available spaces during peak times, and other occupancy and turnover counts that can aid in planning for future parking needs. Many of the observations produced in the Houghton report document could be undertaken by organized volunteers in Hancock if the potential for a funded study is unlikely. Conversations regarding this topic with local officials took place in spring 2022, and at that moment parking in Hancock was 2-hour parking (which was not monitored/enforced) throughout the downtown. Parking is a public resource and actively managing the supply and use of this resource could help improve conditions. Other strategies including shared parking agreements and analysis of parking minimums should be considered simultaneously. As previously illustrated in Figure 7, there is significant off-street parking that may be underutilized which could be pressed into limited public use with the execution of shared parking agreements. The following resources may be helpful in the pursuit of efforts to collect additional information on parking conditions in Hancock.

- Metropolitan Area Planning Council (Massachusetts). (2019) How to do a Parking Study: https://www.mapc.org/resource-library/how-to-do-a-parking-study/.

- North Central Texas Council of Governments. (2023). Parking Toolbox: Parking Solutions for Walkable Places in North Texas. https://parkingtoolbox.nctcog.org/Grid-Navigations.

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Appendix A

City of Houghton/ City of Hancock Fixed Route Transit Modeling

As part of the ongoing USDA funded technical assistance project being undertaken by the National Association of Development Organizations (NADO) and the Western Transportation Institute (WTI) at Montana State University, the project team has been fielding questions regarding existing and future transit services in the communities of Houghton and Hancock. This report will detail currently available services as well as recently modeled conceptual route options serving both communities. These concepts are presented for time and cost considerations by local leaders and stakeholders as decisions regarding future service offerings are evaluated. An early version of these concepts was presented to stakeholders during a webinar held on October 26, 2022. Revisions and updates have been made to the information since that time and are presented here in their final form.

Background

The cities of Houghton and Hancock offer public transportation services to residents of their respective communities. The City of Houghton (population 7,675[1]) offers both fixed route and demand response services. Regarding fixed route services there are two identified routes, the Downtowner Route, which is offered Monday through Friday from 10 a.m. to 12 p.m., making 10 stops at predetermined locations. Fares for this route are $2 for adults and $1 for seniors. The City Commuter Shuttle is also offered and operates during the academic school year for Michigan Technical University (MTU) which is located in Houghton and is home to approximately 7,000 students. This route operates along 13 pre-identified stops and is free for MTU students, faculty, and staff with an MTU ID. On demand transit services are available Monday through Friday from 7 a.m. to 5 p.m., with fares that vary by class of rider and in or out of city origins and destinations. Punch cards for regular riders are available for purchase.

The City of Hancock (population 4,558[2]) offers a demand response public transportation service to residents of the city. Services are available Monday through Friday from 7 a.m. to 5 p.m.. Fares are $5 for adults, $3 for students, $2,50 for senior citizens over 55, and $2.50 for children under 12. As part of an ongoing pilot program concluding at the end of September 2023, veterans ride free with acceptable ID. Transit passes for regular riders are available for purchase as well.

During the technical assistance project, the project team has been in regular contact with representatives from both Houghton and Hancock, and as part of these conversations additional

[1] U.S. Census Bureau - ACS 2021 5 Year Estimates

[2] U.S. Census Bureau - ACS 2021 5 Year Estimates

questions about expanded transit services serving both communities were raised. As part of these conversations NADO staff obtained additional information on ridership, origins, and destinations from the demand response services offered by the City of Hancock. As part of these additional conversations, it was observed that all demand response services were being provided by three drivers and that most requests appeared to be for same day service. Hancock is a recipient of Federal Transit Administration (FTA) section 5311 formula funding for rural areas and utilizes municipal general fund dollars as the required match for this funding.

Focusing on the rider and origin and destination data provided by Hancock, the research team endeavored to create a conceptual model of fixed route service based on observed trip patterns to understand how such a service would compare in both time and cost to the existing demand response service. One day of ridership information recorded via paper log sheet was provided for examination.

Figure 1 - Example Rider Log Sheet

Existing stop locations in use by the City of Houghton for their Downtowner Route and the City Commuter Shuttle were also utilized to inform this exercise.

This document has been updated during summer 2023 following the award of $100,000 in Section 5304 grant funds from the Michigan Department of Transportation (MDOT) for a Houghton/Hancock Transit Consolidation Study. This document has been updated and revised to provide preliminary information to representatives from Houghton and Hancock as they formulate RFP language for the procurement of a contract partner to execute this project.

Process

After receiving the Hancock log sheets, NADO Research Foundation staff analyzed the origins and destinations and created a basic tally of locations the demand response service accessed during the provided period. The most frequent locations identified through this exercise and subsequent conversation with Hancock Transit staff, were collected into a basic network of stops. It is important to recognize that not all of these conceptual stop locations were within Hancock, many were located in the City of Houghton. In total, 23 stop locations were identified across both communities, and three conceptual routes were evaluated as a result; one serving Hancock only, one serving identified locations in Houghton and Hancock, and one serving identified locations in Houghton and Hancock as well as all stops on the City Commuter Shuttle which only serves MTU students during the academic school year. Detailed information on the conceptual routes, timing, and costs is provided in subsequent sections.

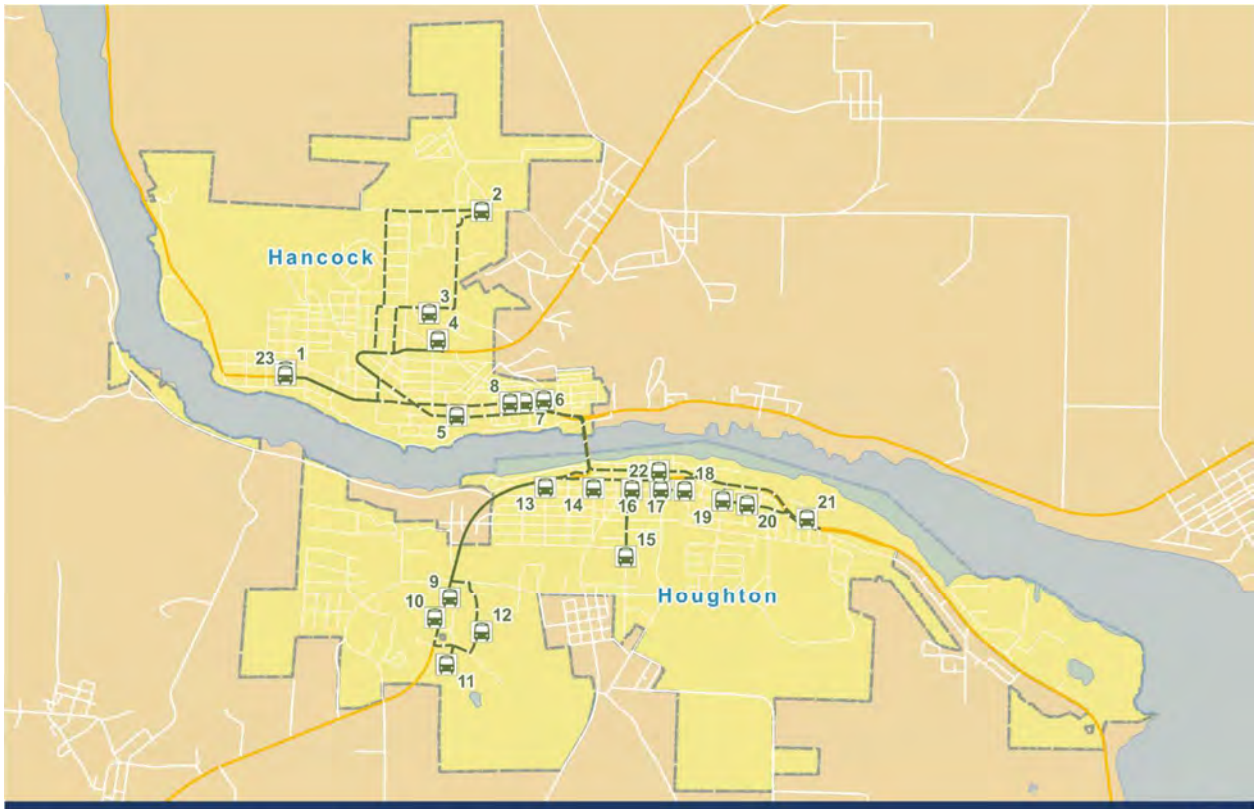

Figure 1: Conceptualized Stop Locations

Appendix A

Table 1: Conceptualized Stop Locations			
1	Lakeview Manor	**13**	Houghton & 4th
2	UP Health	**14**	Houghton & Bridge St.
3	Hancock Apartments	**15**	Arbor Green
4	Dollar General	**16**	Houghton Courthouse
5	Little Brothers	**17**	Houghton & Portage St.
6	La Cantina	**18**	Houghton & Franklin St.
7	Clubhouse	**19**	Houghton & Agate St.
8	Superior Nat. Bank	**20**	Houghton & Emerald St.
9	Walgreens	**21**	MUB
10	McDonalds	**22**	Houghton City Center
11	Walmart	**23**	Lakeview Manor
12	Goodwill		

In order to model the potential costs that may be associated with establishing and operating these routes, the research team utilized revenue mile and hour costs as reported in the National Transit Database (NTD) by the City of Houghton for bus service. This selection was due to Houghton's status as the recipient of MDOT funding for the transit consolidation study effort.[3] Revenue mile and hour expenses for 2021 and a six-year average (2016 – 2021) were utilized to create estimated cost ranges. A range of values are presented in subsequent tables; the 'high' value is based on 2021 data, the 'low' value is based on the observed 6-year averages. The reported values were as follows, 2021, $8.48 per revenue mile, $101.10 per revenue hour; 6-year average, $5.88 per revenue mile, $64.96 per revenue hour. It is important to note that between 2016 and 2021, the cost per revenue mile for Houghton had increased over 98% and the cost per revenue hour had escalated over 499% as reported in NTD data. Cost comparisons are offered in the tables below as calculated on reported per revenue hour costs and per revenue mile costs. The headings with the term 'hours' or 'miles' indicate which cost is being utilized.

Estimated costs and route timings were created for four service scenarios;

Seven Days a Week – Two Trips Per Day
Seven Days a Week – Three Trips Per Day
Five Days a Week – Two Trips Per Day
Five Days a Week – Three Trips Per Day

Modeling for the seven-day service scenarios include an estimated 355 service days per year, observing 10 holidays. The five-day scenarios include an estimated 250 service days per year, also observing 10 holidays and no service on weekends. **All estimates reflect costs for operating a single vehicle on the given route.**

[3] FTA Transit Agency Profile – City of Houghton - https://www.transit.dot.gov/ntd/transit-agency-profiles/houghton-motor-transit-line.

Appendix A

Contact hours of driving time based on route headway are offered for each route, along with an estimated number of miles traveled during a service year. Please note that the total hours reported below only reflect actual driving time and do not include any non-driving administrative tasks. Along with estimated cost ranges, annual and daily fare calculations for full farebox cost recovery are also included. (Note: All fare recovery calculations were generated using the adult in city rate of $5 per rider as reported on the Houghton City website.)

In these scenarios, utilizing Houghton cost data insinuates that the City of Houghton would be providing these services as conceptualized here. This is purely an exercise in cost and time estimation and is not an indication of interest or commitment on behalf of the City of Houghton to establish such services at this time.

Route locations and timings were generated using Open Route Service[4] and desktop GIS software to refine the results and conduct analysis utilizing other spatial datasets.

Vehicle dwell time was factored into the overall travel time of each route as presented in the following sections. Research from the 'Transit Capacity and Quality of Service Manual – 2nd Edition' published by the National Academies of Sciences – Transportation Research Board indicates that for a vehicle with one door channel, passenger boarding service time was 2.5 seconds per person for boarding who had prepaid for the trip. The research report also recommends 3.3 seconds per passenger for alighting through the front door. To normalize the boarding and alighting considerations, we have utilized an average of 2.9 seconds for passenger service in these scenarios. For estimation purposes, a transit vehicle in use with a maximum passenger capacity of 12 riders was utilized in dwell time calculations. This would yield a maximum dwell time of 34.8 (12 x 2.9) seconds per stop at full capacity. For the purposes of this exercise this value has been rounded to 35 seconds (full capacity). Individual route dwell times are listed in the tables below.

[4] https://openrouteservice.org/

Results

Route 1 – Hancock Only

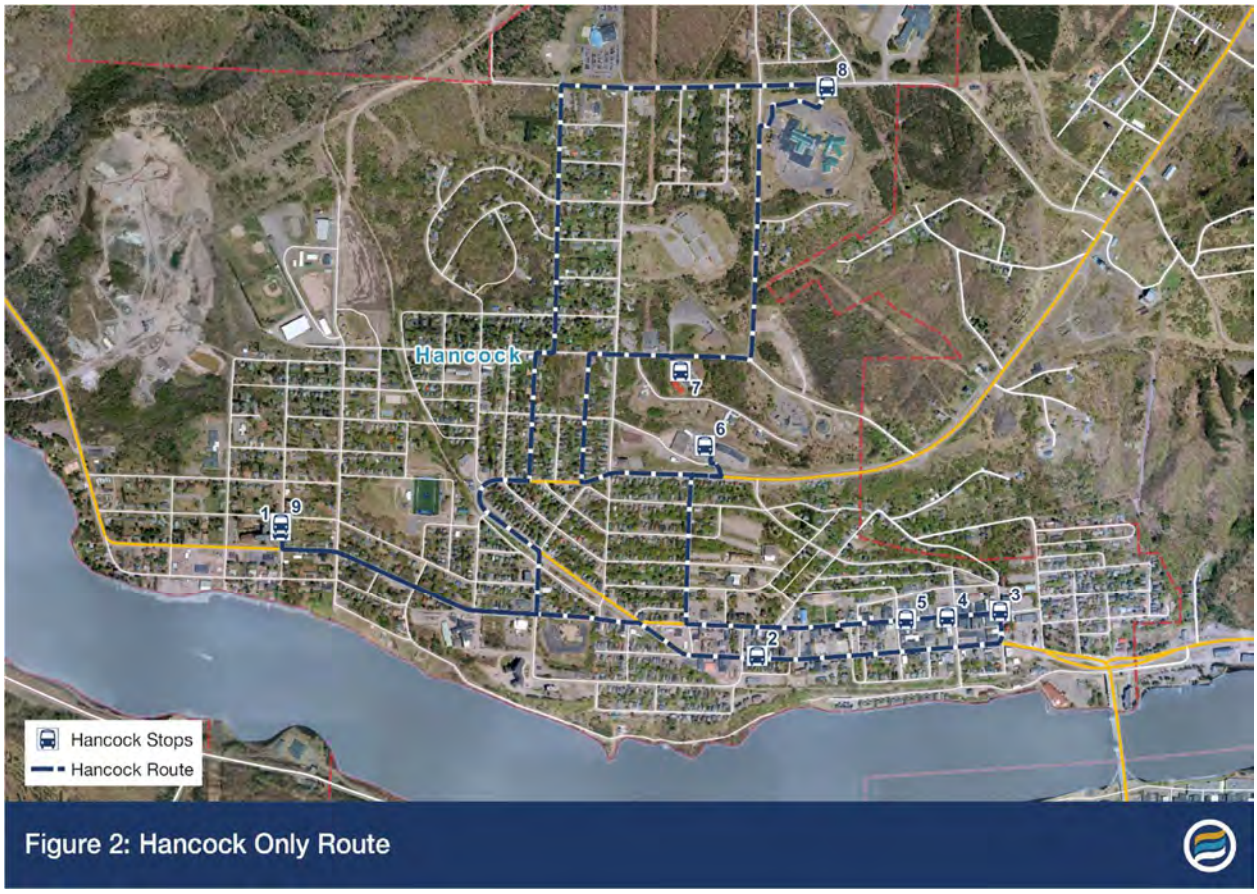

Figure 2: Hancock Only Route

Table 2: Hancock Only Route Details	
Distance:	6.3 Miles
Stops:	9
Headway:	23 minutes 53 seconds
Est. Dwell Time:	5 minutes 15 seconds
Total Travel Time:	29 minutes 8 seconds

The Hancock Only route as modeled would have a total headway of 29 minutes and 8 seconds, including an estimated maximum of 5 minutes and 15 seconds of dwell time for the entire route. If less than 12 passengers board or alight the transit vehicle at each stop, dwell time can be reduced. This route is offered as a looping route, starting and ending in the same location.

Appendix A

Table 3: Hancock Only Stops	
1	Lakeview Manor
2	Little Brothers
3	La Cantina
4	Clubhouse
5	Superior Nat. Bank
6	Dollar General
7	Hancock Apartments
8	UP Health
9	Lakeview Manor

The stops offered here in the Hancock Only route reflect the origins and destinations observed in the driver log data provided to the research team by the City of Hancock. Stops could be added or removed to better reflect the most common trips requested by riders. Additional log data could also be utilized to further refine these locations.

Table 4: Yearly Hour and Mileage Estimates		
	Total Hours	**Total Miles**
7 Days – 2x Day	329	4,586
7 Days – 3x Day	494	6,880
5 Days – 2x Day	235	3,276
5 Days – 3x Day	353	4,914

Table 4 illustrates the estimated total hours of driving and miles covered during one year of service based on the particular five or seven-day scenario that is selected. The highest calculated number of driving hours and mileage would be 494 hours and 6,880 miles in the 7 days a week/3 times a day scenario. The 5 days a week/ 2 times a day scenario produces the lowest number of hours and miles, with 235 hours and 3,276 miles estimated annually. These patterns of high and low values are constant across all the comparison tables found below.

Table 5: Estimated Costs				
	Hours		**Miles**	
	High Est. Cost	**Low Est. Cost**	**High Est. Cost**	**Low Est. Cost**
7 Days – 2x Day	$33,289.64	$21,389.67	$38,892.67	$26,968.03
7 Days – 3x Day	$49,934.46	$32,084.50	$58,339.01	$40,452.05
5 Days – 2x Day	$23,778.32	$15,278.33	$27,780.48	$19,262.88
5 Days – 3x Day	$35,667.47	$22,917.50	$41,670.72	$28,894.32

Table 5 illustrates the estimated costs for each option based on the reported revenue mile or revenue hour cost reported in the NTD. The least expensive option as calculated was the 5 days a week/ 2 times a day scenario, which is estimated to cost between $15,278 and $27,780. The most expensive option as calculated was the 7 days a week/ 3 times a day scenario, which is estimated to cost between $32,085 and $58,339.

Table 6: Farebox Recovery Estimates				
	Fares Per Year		Fares Per Day	
	High	Low	High	Low
7 Days – 2x Day	7,779	4,278	22	12
7 Days – 3x Day	11,668	6,417	33	18
5 Days – 2x Day	5,556	3,056	22	9
5 Days – 3x Day	8,334	4,583	33	13

Table 6 illustrates the number of fares that would be needed annually and daily to accomplish full farebox recovery for costs related to these service scenarios. Calculations in Table 6 are based on $5 adult fares. These annual estimates are based on dividing the highest calculated cost value ('High Estimated Cost (Miles)') and lowest calculated value ('Low Estimated Cost (Hours)') by the fare value. Daily estimates are calculated by dividing the annual value by the number of service days in that scenario; 355 in the 7-day scenario, 250 in the 5-day scenario.

Route 2 – Hancock and Houghton

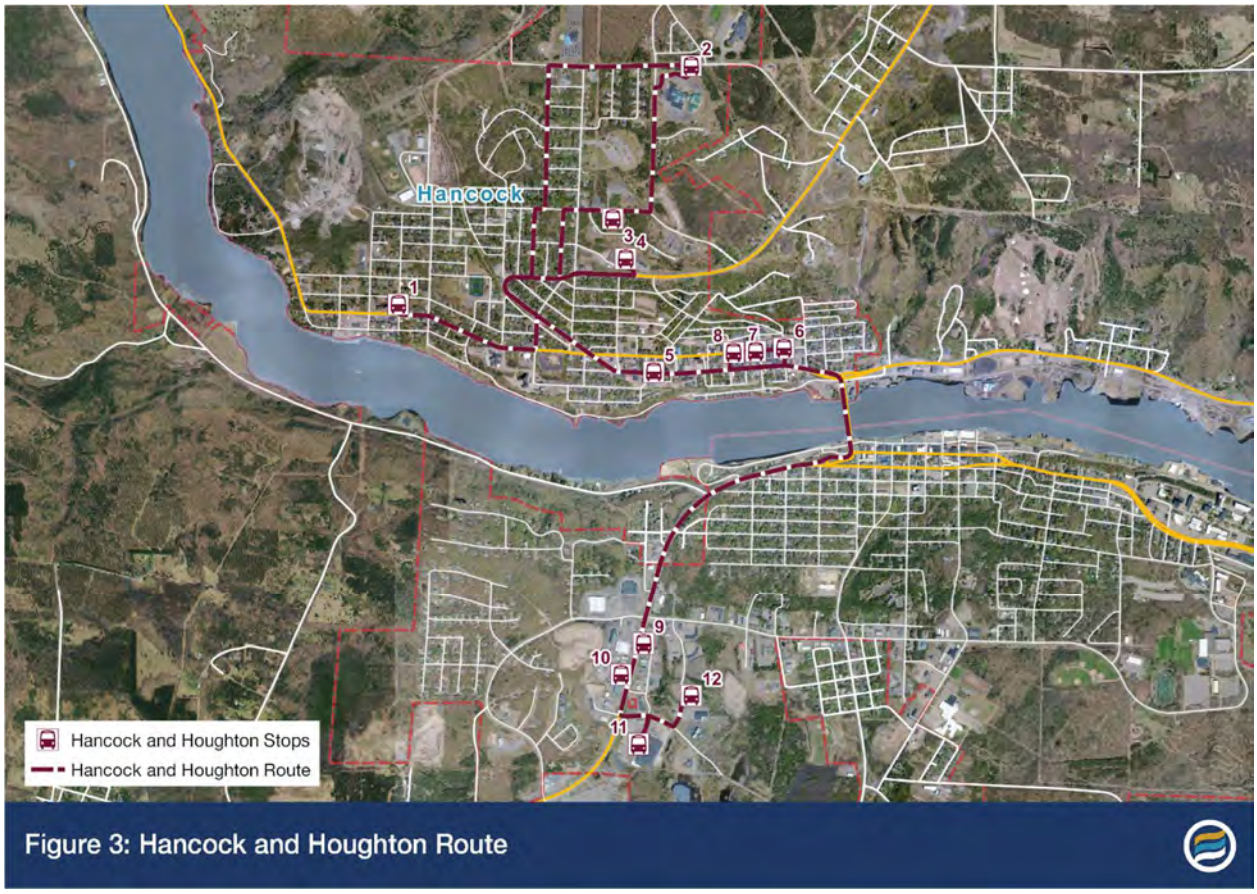

Figure 3: Hancock and Houghton Route

Table 7: Hancock and Houghton Route Details	
Distance:	8.4 Miles
Stops:	12
Headway:	28 minutes 54 seconds
Est. Dwell Time:	7 minutes
Total Travel Time:	35 minutes 54 seconds

Appendix A

Table 8: Hancock and Houghton Stops	
1	Lakeview Manor
2	UP Health
3	Hancock Apartments
4	Dollar General
5	Little Brothers
6	La Cantina
7	Clubhouse
8	Superior Nat. Bank
9	Walgreens
10	McDonalds
11	Walmart
12	Goodwill

The Hancock and Houghton route as modeled has a total headway of 35 minutes and 54 seconds, including 7 minutes of dwell time. The route includes 12 total stops. It is important to note that this route configuration and listing of stops is the closest representation of the total collection of origins and destinations reflected in the provided driver log data. This route was modeled as a one-way route, meaning it would run beginning to end in either direction, and provide service in the opposite direction after a predetermined amount of time.

Table 9: Yearly Hour and Mileage Estimates		
	Total Hours	**Total Miles**
7 Days – 2x Day	435.6	6,115.2
7 Days – 3x Day	653.5	9,172.8
5 Days – 2x Day	311.2	4,368.0
5 Days – 3x Day	466.8	6,552.0

Table 9 illustrates the estimated total hours of driving and miles covered during one year of service based on the five or seven-day scenario that is selected. The highest calculated number of driving hours and mileage would be 653 hours and 9,173 miles in the 7 days a week/3 times a day scenario. The 5 days a week/ 2 times a day scenario produces the lowest number of hours and miles, with 311 hours and 4,368 miles estimated annually.

Table 10: Estimated Costs				
	Hours		**Miles**	
	High Est. Cost	**Low Est. Cost**	**High Est. Cost**	**Low Est. Cost**
7 Days – 2x Day	$44,042.72	$28,298.86	$51,856.90	$35,957.38
7 Days – 3x Day	$66,064.08	$42,448.29	$77,785.34	$53,936.06
5 Days – 2x Day	$31,459.08	$20,213.47	$37,040.64	$25,683.84
5 Days – 3x Day	$47,188.63	$30,320.21	$55,560.96	$38,525.76

Appendix A

Table 10 illustrates the estimated costs for each option based on the reported revenue mile or revenue hour cost reported in the NTD. The least expensive option as calculated was the 5 days a week/ 2 times a day scenario, which is estimated to cost between $20,213 and $37,041. The most expensive option as calculated was the 7 days a week/ 3 times a day scenario, which is estimated to cost between $42,448 and $77,785.

Table 11: Farebox Recovery Estimates				
	Fares Per Year		Fares Per Day	
	High	Low	High	Low
7 Days – 2x Day	10,371	5,660	29	16
7 Days – 3x Day	15,557	8,490	44	24
5 Days – 2x Day	7,408	4,043	30	11
5 Days – 3x Day	11,112	6,064	44	17

Table 11 illustrates the number of fares that would be needed annually and daily to accomplish full farebox recovery for costs related to any of these service scenarios. Calculations in Table 6 are based on $5 adult fares. These annual estimates are based on dividing the highest calculated cost value ('High Estimated Cost (Miles)') and lowest calculated value ('Low Estimated Cost (Hours)') by the fare value. Daily estimates are calculated by dividing the annual value by the number of service days in that scenario; 355 in the 7-day scenario, 250 in the 5-day scenario.

Route 3 – All Stops

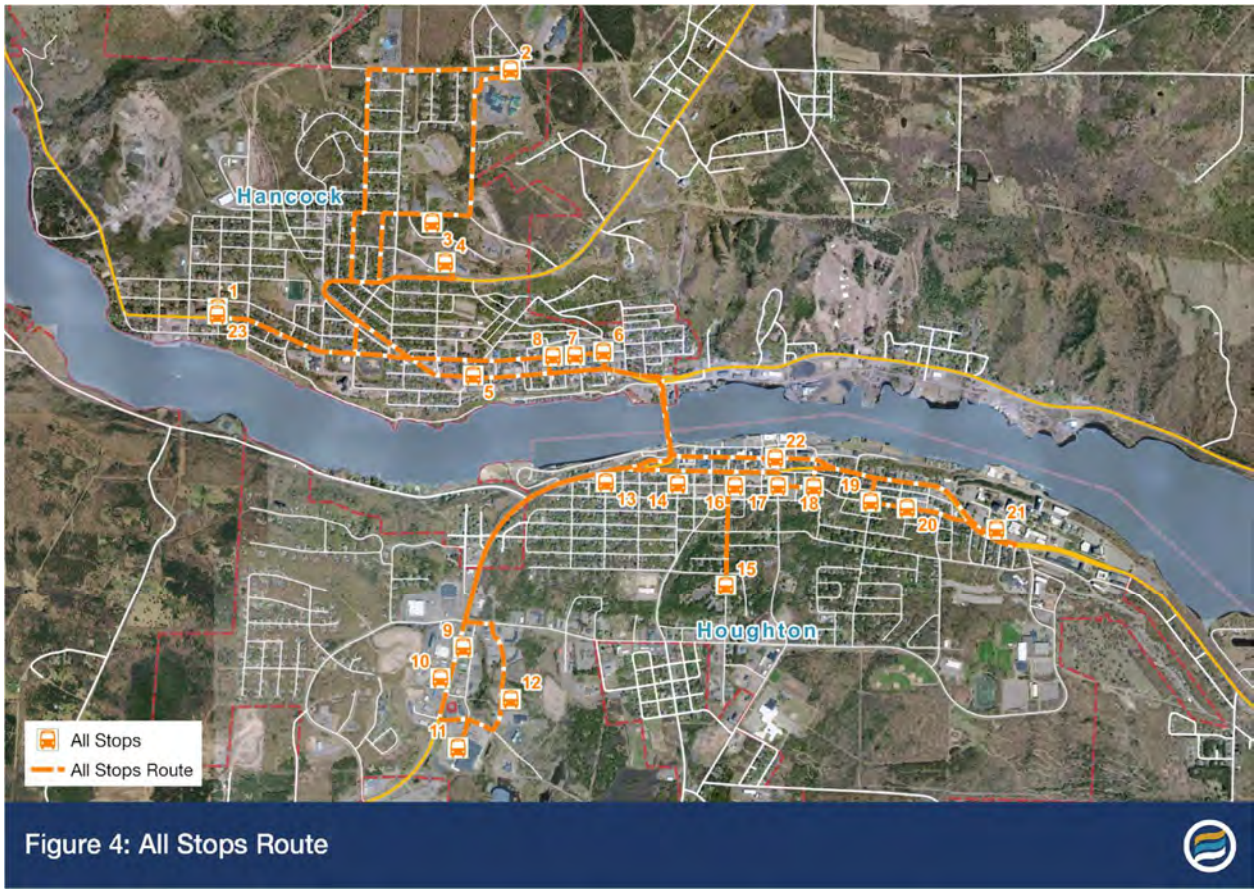

Figure 4: All Stops Route

Table 12: All Stops Route Details	
Distance:	15.7 Miles
Stops:	23
Headway:	50 minutes 27 seconds
Est. Dwell Time:	13 minutes 24 seconds
Total Travel Time:	1 hour 3 minutes 51 seconds

Table 13: All Stops					
1	Lakeview Manor	**9**	Walgreens	**17**	Houghton & Portage St.
2	UP Health	**10**	McDonalds	**18**	Houghton & Franklin St.
3	Hancock Apartments	**11**	Walmart	**19**	Houghton & Agate St.
4	Dollar General	**12**	Goodwill	**20**	Houghton & Emerald St.
5	Little Brothers	**13**	Houghton & 4th	**21**	MUB
6	La Cantina	**14**	Houghton & Bridge St.	**22**	Houghton City Center
7	Clubhouse	**15**	Arbor Green	**23**	Lakeview Manor
8	Superior Nat. Bank	**16**	Houghton Courthouse		

Appendix A

The All Stops route as modeled has a total headway of 1 hour 3 minutes and 51 seconds, including 13 minutes and 24 seconds of dwell time. The route includes 23 total stops. This route includes all stop locations as identified in the previous Hancock and Hancock/Houghton routes plus all identified stops for the City Commuter Shuttle that serves MTU students. It is important to note that stops 13 through 23 were not identified in the log sheet data provided by Houghton, so costs modeled here based on NTD data do not reflect any inclusion of historical expenses for services to these locations.

Table 14: Yearly Hour and Mileage Estimates		
	Total Hours	**Total Miles**
7 Days – 2x Day	774.7	11,502.4
7 Days – 3x Day	1,162.0	17,253.6
5 Days – 2x Day	553.3	8,216.0
5 Days – 3x Day	830.0	12,324.0

Table 14 illustrates the estimated total hours of driving and miles covered during one year of service based on the particular five- or seven-day scenario that is selected. The highest calculated number of driving hours and mileage would be 1,162 hours and 17,254 miles in the 7 days a week/3 times a day scenario. The 5 days a week/ 2 times a day scenario produces the lowest number of hours and miles, with 553 hours and 8,216 miles estimated annually.

Table 15: Estimated Costs				
	Hours		**Miles**	
	High Est. Cost	**Low Est. Cost**	**High Est. Cost**	**Low Est. Cost**
7 Days – 2x Day	$78,318.61	$50,322.23	$96,923.01	$67,206.05
7 Days – 3x Day	$117,477.92	$75,483.34	$145,384.51	$100,809.07
5 Days – 2x Day	$55,941.87	$35,944.45	$69,230.72	$48,004.32
5 Days – 3x Day	$83,912.80	$53,916.67	$103,846.08	$72,006.48

Table 15 illustrates the estimated costs for each option based on the reported revenue mile or revenue hour cost reported in the NTD. The least expensive option as calculated was the 5 days a week/ 2 times a day scenario, which is estimated to cost between $35,944 and $69,231. The most expensive option as calculated was the 7 days a week/ 3 times a day scenario, which is estimated to cost between $75,483 and $145,385.

Appendix A

Table 16: Farebox Recovery Estimates				
	Fares Per Year		Fares Per Day	
	High	Low	High	Low
7 Days – 2x Day	19,385	10,064	55	28
7 Days – 3x Day	29,077	15,097	82	43
5 Days – 2x Day	13,846	7,189	55	20
5 Days – 3x Day	20,769	10,783	83	30

Table 16 illustrates the number of fares that would be needed annually and daily to accomplish full farebox recovery for costs related to any of these service scenarios. Calculations in Table 6 are based on $5 adult fares. These annual estimates are based on dividing the highest calculated cost value ('High Estimated Cost (Miles)') and lowest calculated value ('Low Estimated Cost (Hours)') by the fare value. Daily estimates are calculated by dividing the annual value by the number of service days in that scenario; 355 in the 7-day scenario, 250 in the 5-day scenario.

Appendix B

Houghton County Countywide Transit Service Modeling

As part of the ongoing USDA funded technical assistance project being undertaken by the National Association of Development Organizations (NADO) and the Western Transportation Institute (WTI) at Montana State University, the project team has been fielding questions regarding additional transit options in the communities of Houghton and Hancock, as well as the County of Houghton. This report will detail recently modeled conceptual route options presented for time and cost considerations by local leaders and stakeholders.

Background

Representatives from the Western Upper Peninsula Planning & Development Region (WUPPDR) have indicated to the research team that a county wide transit system did exist and operate in Houghton County in the past but was not able to sustain. Services were terminated and individual communities were left to provide services for residents based on the resources they could individually muster. Both Hancock and Houghton have been able to establish and provide services using Federal Transit Administration (FTA) section 5311 rural formula grant funding. A listing of all 82 local transit agencies in Michigan can be found at the Michigan Public Transit website[1].

The City of Houghton offers a demand response service and a traditional fixed route service to residents; Hancock offers a demand response service only. At the time of this report there is no regular countywide transit service to locations outside the communities of Houghton and Hancock. Demand response services in both communities can make scheduled trips to locations in the county for an increased fare. Details surrounding each service can be found on their respective websites.

As research on this technical assistance project has progressed, additional questions have been raised by both WUPPDR staff, transportation stakeholders, and third parties conducting planning efforts on behalf of local communities related to any considerations of wider transit services being offered in Houghton County in the future.

Process

In order to provide a response to these questions as they relate to one of the major employers and economic drivers of the region, Michigan Technical University (MTU), the research team requested student and employee address information from the MTU Office of Institutional Research. Two lists were provided to the research team. An employee listing of 1,577 addresses, and a student listing of 2,959 addresses. The research team processed this data utilizing the U.S. Census Bureau batch geocoding tool[2] to generate coordinate information for each address that could be utilized to create a point feature layer in a desktop GIS application. The Census geocoder

[1] https://www.michiganpublictransit.com/

[2] https://geocoding.geo.census.gov/geocoder/locations/addressbatch?form

produced a 88.4% match rate (1,394 of 1,577) for addresses included in the employee list, and a 93.2% match rate (2,759 of 2,959) for student addresses. As presented the most distant employee address was located approximately 45 miles from the MTU campus. The most distant student address was located approximately 47 miles away. (Both measurements in straight line distance.) An image of the resulting data is included below as Figure 1. This distribution of students and employees will be one factor in the exercise of establishing conceptual transit service areas that could serve the widest interests of county residents. This address data will serve as one source of origins and destinations for consideration.

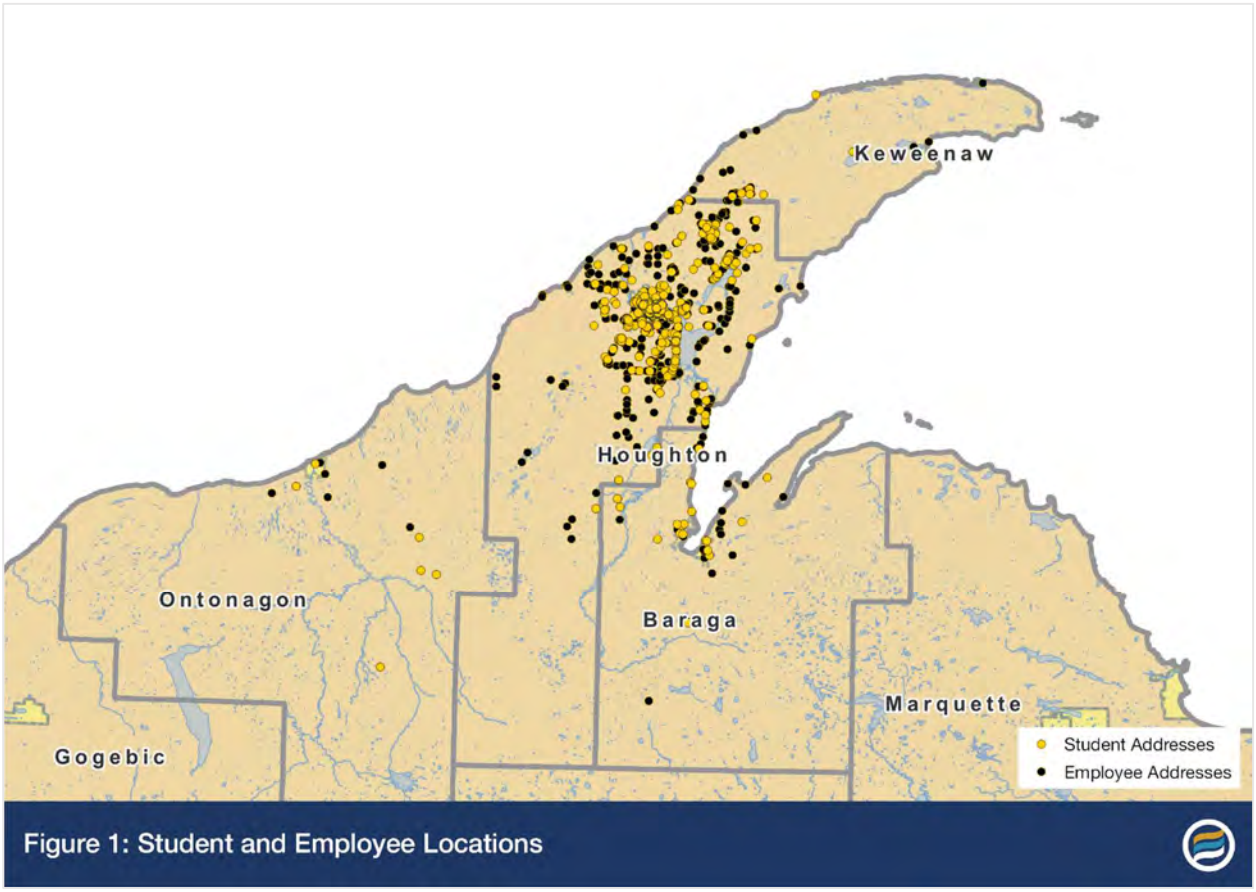

Figure 1: Student and Employee Locations

A second key piece of data utilized to identify locations that may benefit from expanded transit services are generalized employment locations for workers in Houghton County. The U.S. Census Bureau LEHD On The Map tool was utilized to access employment location and density information from 2020.[3] This data is generated from Quarterly Census for Employment and Wages (QCEW) information collected from participating states in partnership with the Bureau of Labor Statistics (BLS).[4] This data set will serve as a second source of potential origins and destinations to be considered when conceptualizing expanded transit service locations. The data is displayed in Figure 2 below.

[3] https://onthemap.ces.census.gov/

[4] https://lehd.ces.census.gov/applications/help/onthemap.html#!data_sources

Appendix B

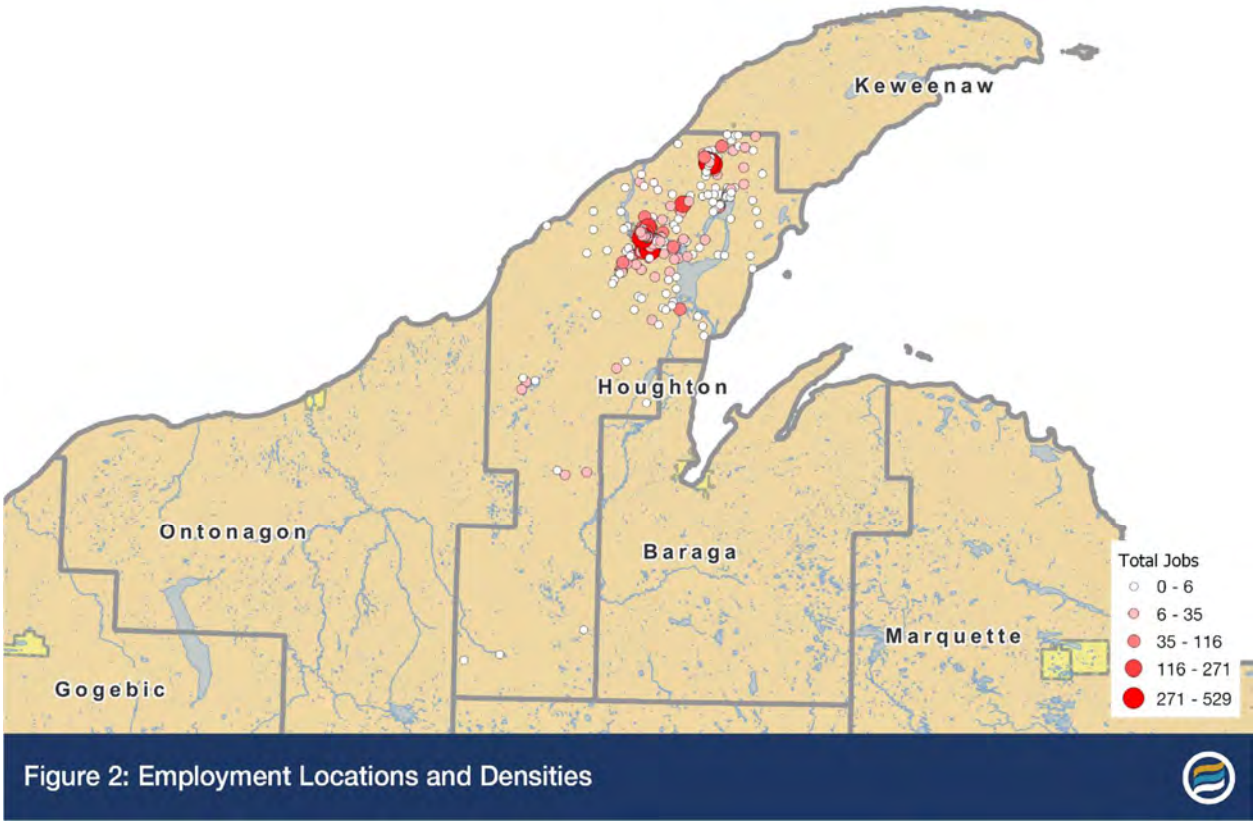

Figure 2: Employment Locations and Densities

Evaluating these data sets together, the research team visually assessed densities of both MTU employees, MTU students, and LEHD reported employment locations for Houghton County workers. Proximity of these locations to road segments that may be conducive for bus/van vehicle travel was also considered. Locations where potential 'stop' locations could be located were also evaluated at a desktop GIS/planning level. No due diligence was undertaken on these locations, as they are provided for modeling purposes only in this exercise. In total 16 potential 'stop' locations were identified based on this evaluation. Connecting these stops together are two distinct routes serving the county: one travelling north from the Houghton/Hancock area toward Calumet and one travelling south toward the communities of Chassell and Painesdale. The conceptual routes are illustrated below in Figure 3, with stop information included in Tables 1 and 2.

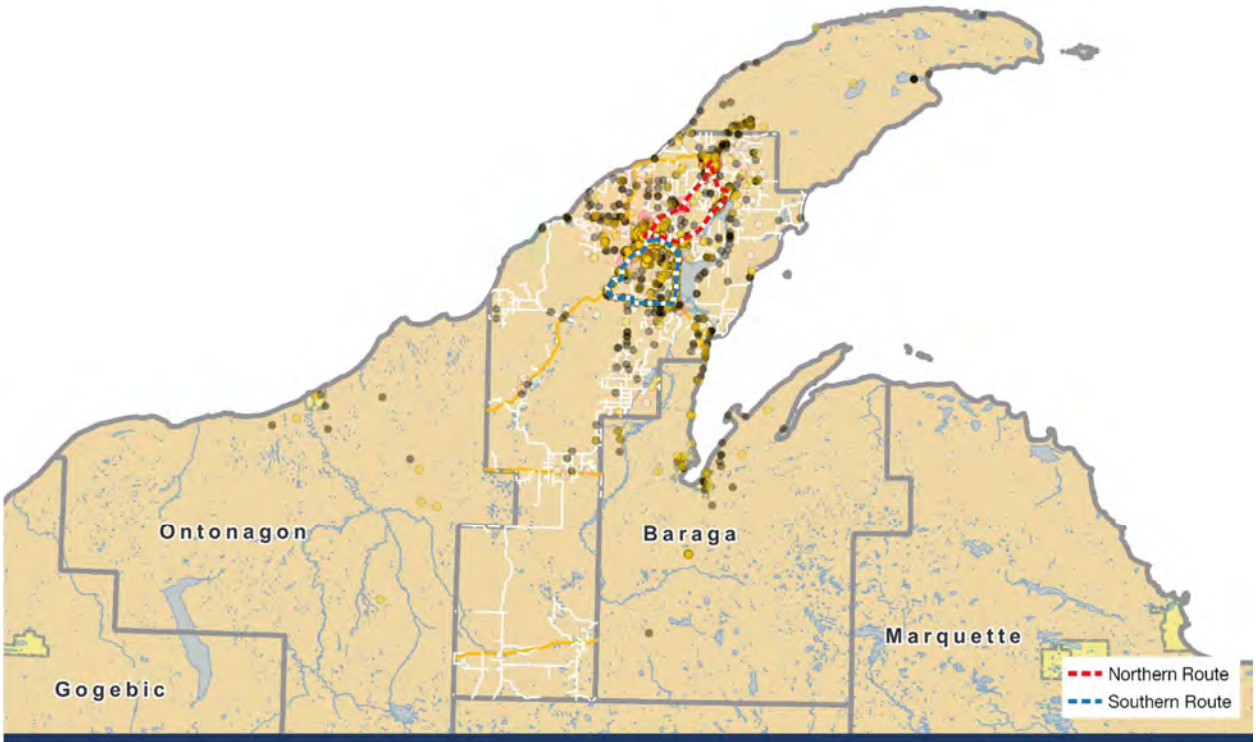

Figure 3: Conceptual North and South Transit Routes

Table 1: Northern Route Stops	
1	Houghton City Hall
2	Hancock City Hall
3	Houghton County Airport
4	Float Copper Memorial (Calumet)
5	Lake Linden Park (Lake Linden)
6	Tamarack Park (Hubbell)
7	26 and Main Steet (Dollar Bay)
8	Houghton City Hall

Table 2: Southern Route Stops	
1	Houghton City Hall
2	Nara Nature Park
3	41 and Britz Road
4	41 and 5th Street (Chassell)
5	Superior and Chassell Painesdale Rd.
6	Kersearge St. and Hulbert (Painesdale)
7	26 and Stanton Ave. (South Range)
8	Houghton City Hall

Analysis and Results

Distance, time, and cost estimates for each route are provided in subsequent sections below. Distance and time estimations were generated using Open Route Service online routing tool and refined in desktop GIS applications by the research team. The research team also assumed that such a service would be operated by the City of Houghton, and costs used for estimation purposes were based on expenses reported to the National Transit Database (NTD) and published in the Houghton Motor Transit Line transit agency profile found on the Federal Transit Administration (FTA) website.[5] Both revenue mile and revenue hour data reported for bus service were used in

[5] https://www.transit.dot.gov/ntd/transit-agency-profiles/houghton-motor-transit-line

the calculations. A range of costs are offered for consideration, the 'high' value was calculated using only the 2021 costs as reported. The 'low' value was calculated utilizing a six-year average of bus operating costs from years 2016 to 2021 as reported in NTD data. The 2021 cost per revenue mile and revenue hour were $8.48 and $101.10 respectively. The six-year averages (2016-2021) per revenue mile and revenue hour were $5.88 and $64.96 respectively. Comparable sets of calculations are created utilizing revenue hour costs and revenue mile costs. Contact hours of driving time based on route headway are offered for each route, along with an estimated number of miles travelled during a service year. Please note that the estimated total hours reported below only reflect actual driving time and do not include any non-driving administrative tasks that may be required. Along with estimated cost ranges, annual and daily fare calculations for full farebox cost recovery is also included. (Note: All fare recovery calculations were generated using the adult, out of city rate of $6 per rider as reported on the Houghton City website.) All calculations and estimates are based on the operation of one vehicle.

Four service scenarios were generated for each route:

Seven Days a Week – Two Trips Per Day
Seven Days a Week – Three Trips Per Day
Five Days a Week – Two Trips Per Day
Five Days a Week – Three Trips Per Day

Modeling for the seven-day service scenarios include an estimated 355 service days per year, observing 10 holidays. The five-day scenarios include an estimated 250 service days per year, also observing 10 holidays and no service on weekends.

Further details regarding the individual conceptual routes as created are provided below.

Appendix B

Northern Route Summary

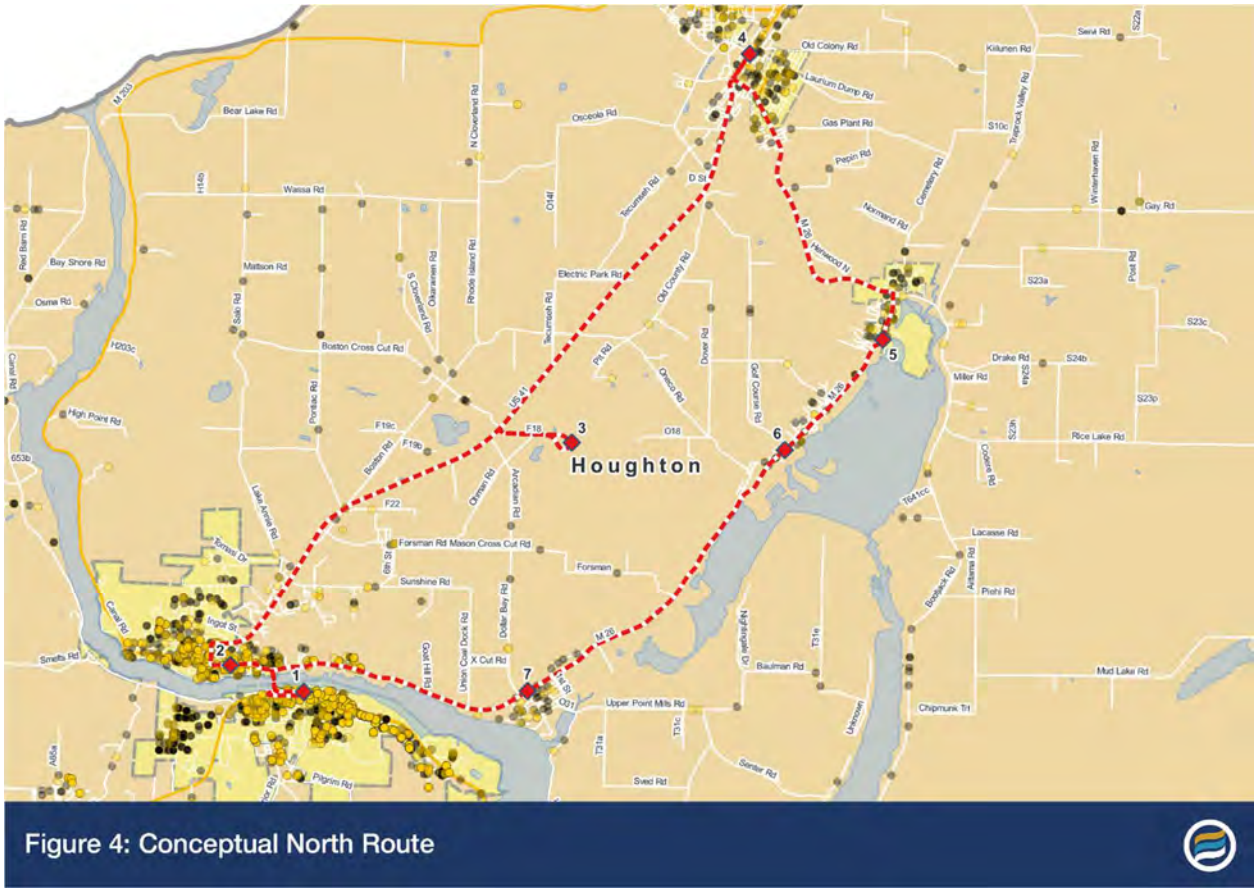

Table 3: North Route Details	
Distance:	30.3 Miles
Stops:	8
Headway:	1 hour 5 minutes 30 seconds
Est. Dwell Time:	4 minutes 40 seconds
Total Travel Time:	1 hour 10 minutes 10 seconds

Table 4: Yearly Hour and Mileage Estimates		
	Total Hours	**Total Miles**
7 Days – 2x Day	851.4	22,058
7 Days – 3x Day	1,277.1	33,088
5 Days – 2x Day	608.1	15,756
5 Days – 3x Day	912.2	23,634

Appendix B

Table 5: Estimated Costs				
	Hours		Miles	
	High Est. Cost	Low Est. Cost	High Est. Cost	Low Est. Cost
7 Days – 2x Day	$86,076.14	$55,306.68	$187,055.23	$129,703.39
7 Days – 3x Day	$129,114.20	$82,960.03	$280,582.85	$194,555.09
5 Days – 2x Day	$61,482.95	$39,504.77	$133,610.88	$92,645.28
5 Days – 3x Day	$92,224.43	$59,257.16	$200,416.32	$138,967.92

Table 6: Farebox Recovery Estimates				
	Fares Per Year		Fares Per Day	
	High	Low	High	Low
7 Days – 2x Day	31,176	9,218	88	26
7 Days – 3x Day	46,764	13,827	132	39
5 Days – 2x Day	22,268	6,584	89	19
5 Days – 3x Day	33,403	9,876	134	28

Appendix B

Southern Route Summary

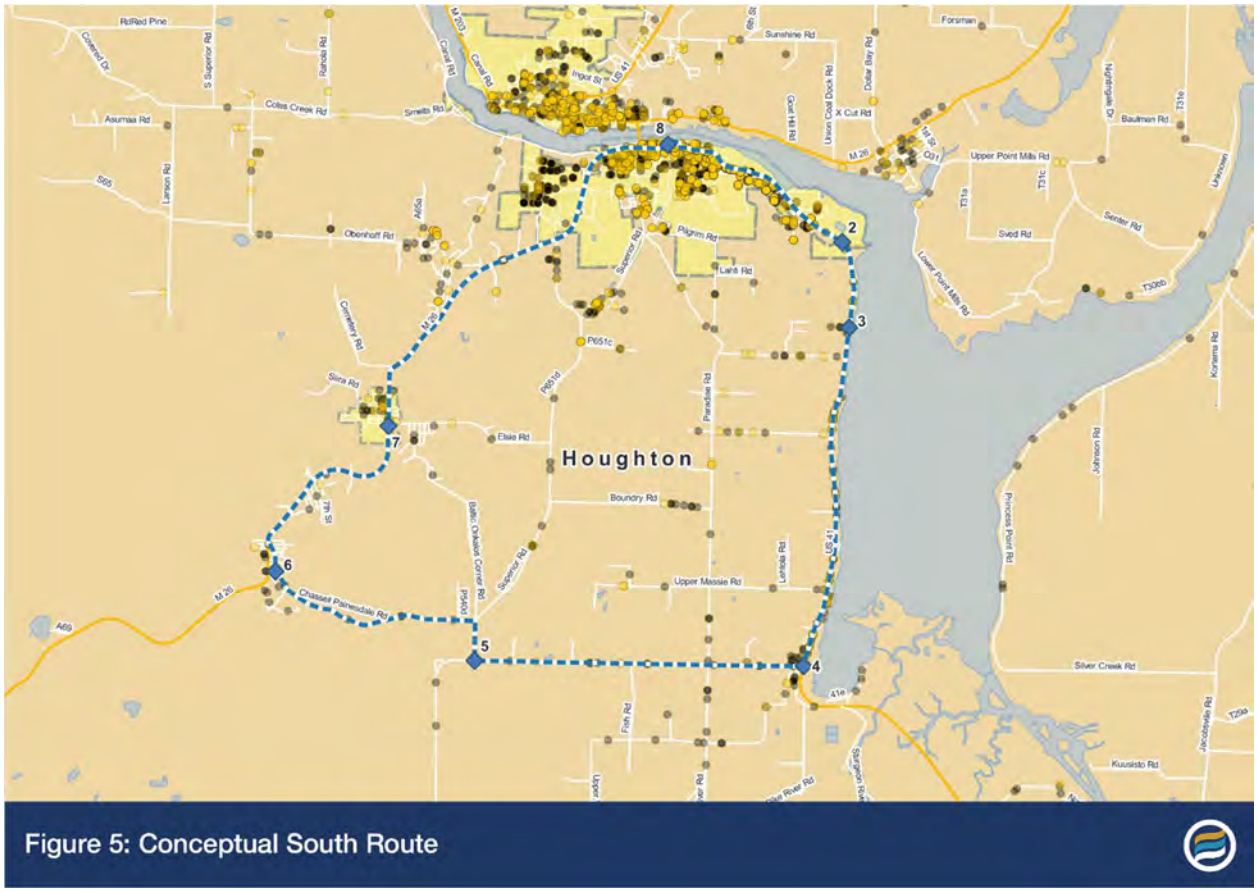

Figure 5: Conceptual South Route

Table 7: South Route Details	
Distance:	24.6 Miles
Stops:	8
Headway:	59 minutes 36 seconds
Est. Dwell Time:	4 minutes 40 seconds
Total Travel Time:	1 hour 4 minutes 16 seconds

Table 8: Yearly Hour and Mileage Estimates		
	Total Hours	Total Miles
7 Days – 2x Day	779.8	17,909
7 Days – 3x Day	1,169.6	26,863
5 Days – 2x Day	557	12,792
5 Days – 3x Day	835.5	19,188

Appendix B

Table 9: Estimated Costs				
	Hours		Miles	
	High Est. Cost	Low Est. Cost	High Est. Cost	Low Est. Cost
7 Days – 2x Day	$78,833.82	$50,653.26	$151,866.62	$105,303.74
7 Days – 3x Day	$118,250.73	$75,979.89	$227,799.94	$157,955.62
5 Days – 2x Day	$56,309.87	$36,180.90	$108,476.16	$75,216.96
5 Days – 3x Day	$84,464.80	$54,271.35	$162,714.24	$112,825.44

Table 10: Farebox Recovery Estimates				
	Fares Per Year		Fares Per Day	
	High	Low	High	Low
7 Days – 2x Day	25,311	8,442	71	24
7 Days – 3x Day	37,967	12,663	107	36
5 Days – 2x Day	18,079	6,030	72	17
5 Days – 3x Day	27,119	9,045	108	25

Potential Ridership Estimates

As the research team based the initial route formulation and cost estimates on the home locations of MTU students and employees, a wider perspective of potential ridership is offered here for consideration. Utilizing address data provided by the Houghton County Sheriff's Office, the research team was able to utilize attribute information to separate county addresses into residential and commercial categories. In total there are 18,418 addresses: 17,147 residential and 925 commercial. For the analysis of potential ridership, only residential addresses were utilized. In creating buffer areas within ¼, ½ and 1 mile from the proposed route locations, the number of residential addresses was ascertained. The residential addresses were utilized to estimate the potential population in these areas, as well as the potential number of residents of working age (16 or over). Additional factors found in public research data described in the methodology below were applied to these population calculations to produce the final ridership estimates.

Appendix B

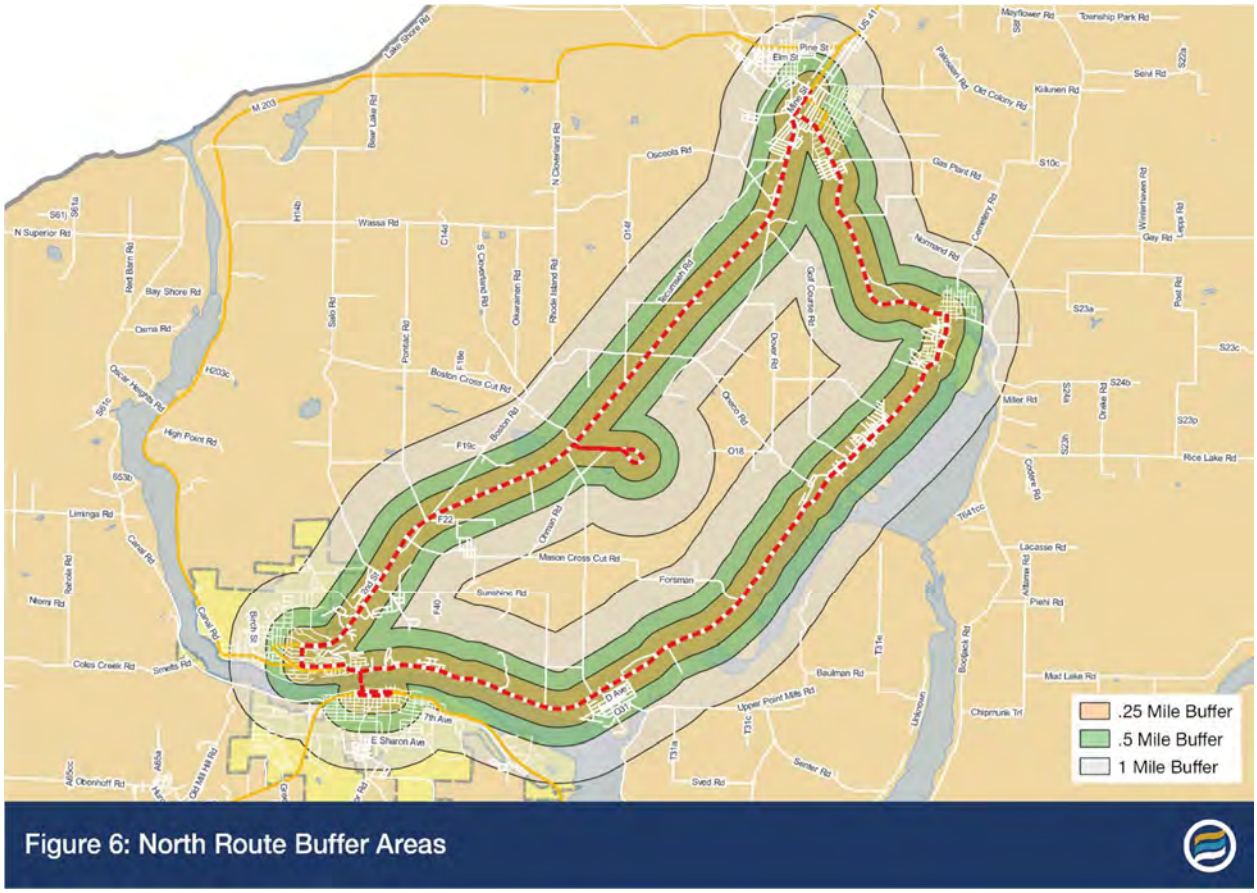

Figure 6: North Route Buffer Areas

Table 11: Route 1 – North – Potential Ridership			
	¼ Mile	½ Mile	1 Mile
Residential Addresses	3,917	5,745	7,912
Estimated Population	9,793	14,363	19,780
Estimated 18+ Population	7,785	11,418	15,725
Total Potential Riders – Low	184	270	372
Total Potential Riders - High	197	289	398

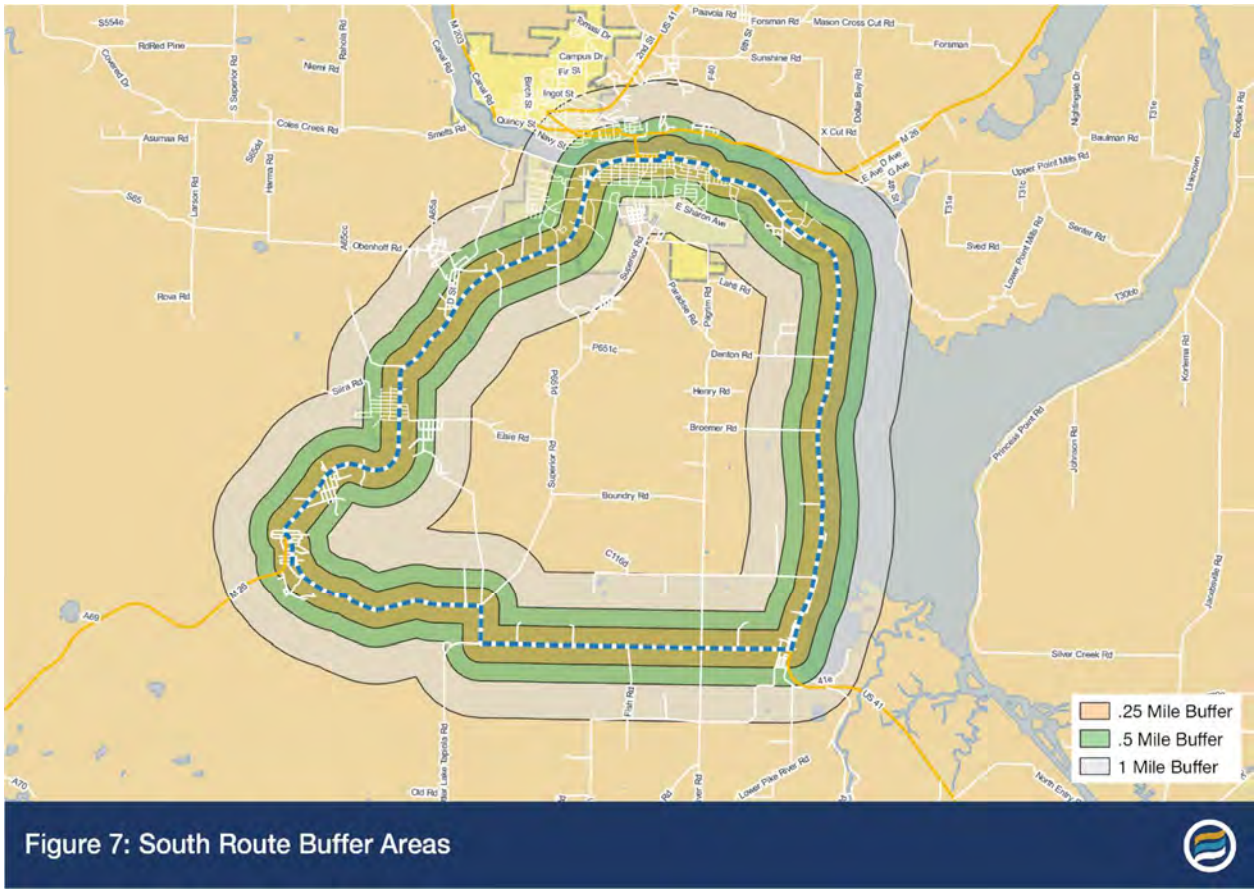

Figure 7: South Route Buffer Areas

Table 12: Route 2 – South – Potential Ridership			
	¼ Mile	½ Mile	1 Mile
Residential Addresses	2,286	3,260	4,749
Estimated Population	5,715	8,150	11,873
Estimated 18+ Population	4,543	6,479	9,439
Total Potential Riders – Low	108	153	223
Total Potential Riders - High	115	164	239

General Feasibility

Based on these levels of estimated ridership, and the previously presented estimated number of riders/adult fares needed for full farebox cost recovery the following observations are offered. Both the farebox cost recovery estimates and the potential ridership values were offered with high/low ranges based on cost and population factors respectively. The combinations of options available for these high/low ranges will be presented below in the following scenarios for each route:

Low Cost/ Low Rider
High Cost/Low Rider

Appendix B

Low Cost/High Rider
High Cost/High Rider

The route service days and completions per day (i.e. 7 Days – 2x Day, 5 Days – 3x Day, etc.) will be described as 'configurations'. The cost and fare combinations (i.e. Low Cost/Low Rider, High Cost/ High Rider, etc.) will be described as 'scenarios' in the feasibility summaries below.

North Route - Comparing the number of estimated riders with the number of fares needed per day for full farebox recovery for the conceptual North Route, there are enough potential riders within all buffer areas (.25 mi., .5 mi., 1 mi.) of the proposed route to potentially meet full farebox recovery for all proposed configurations and scenarios. In order for this to take place, the following percentages of potential riders available would need to utilize the transit service:

Table 13: North Route – Percentage of Potential Riders Needed for Cost Recovery - .25 mile

	Low Cost/ Low Rider	High Cost/ Low Rider	Low Cost/ High Rider	High Cost/ High Rider
7 Days – 2x Day	14.11%	47.76%	13.19%	44.66%
7 Days – 3x Day	21.17%	71.65%	19.79%	66.99%
5 Days – 2x Day	10.31%	48.31%	9.64%	45.17%
5 Days – 3x Day	15.2%	72.73%	14.21%	68.00%

Table 14: North Route – Percentage of Potential Riders Needed for Cost Recovery - .5 mile

	Low Cost/ Low Rider	High Cost/ Low Rider	Low Cost/ High Rider	High Cost/ High Rider
7 Days – 2x Day	9.62%	32.57%	9.00%	30.45%
7 Days – 3x Day	14.43%	48.85%	13.49%	45.67%
5 Days – 2x Day	7.03%	32.94%	6.57%	30.79%
5 Days – 3x Day	10.36%	49.59%	9.69%	46.36%

Table 15: North Route – Percentage of Potential Riders Needed for Cost Recovery - 1 mile

	Low Cost/ Low Rider	High Cost/ Low Rider	Low Cost/ High Rider	High Cost/ High Rider
7 Days – 2x Day	6.99%	23.65%	6.53%	22.11%
7 Days – 3x Day	10.48%	35.47%	9.80%	33.16%
5 Days – 2x Day	5.11%	23.92%	4.77%	22.36%
5 Days – 3x Day	7.52%	36.01%	7.03%	33.67%

South Route - Comparing the number of estimated riders with the number of fares needed per day for full farebox recovery for the conceptual South Route, there are enough potential riders within all buffer areas (.25 mi., .5 mi., 1 mi.) of the proposed route to potentially meet full farebox recovery with the following two exceptions. In the calculations for ridership within .25 miles of the proposed route, 99% and 100% of potential riders would be needed respectively to support the 7 days a week/ 3 times per day configuration in the high cost/ low rider scenario, and the 5 days a week/ 3 times per day configuration in the high cost/ low rider scenario. These configurations may not be feasible and are highlighted in Table 16. Details regarding all configurations and scenarios are offered in the tables below.

Appendix B

Table 16: South Route – Percentage of Potential Riders Needed for Cost Recovery - .25 mile				
	Low Cost/ Low Rider	**High Cost/ Low Rider**	**Low Cost/ High Rider**	**High Cost/ High Rider**
7 Days – 2x Day	22.22%	65.74%	20.87%	61.74%
7 Days – 3x Day	33.33%	***99.07%***	31.30%	93.04%
5 Days – 2x Day	15.74%	66.67%	14.78%	62.61%
5 Days – 3x Day	23.15%	***100.00%***	21.74%	93.91%

Table 17: South Route – Percentage of Potential Riders Needed for Cost Recovery - .5 mile				
	Low Cost/ Low Rider	**High Cost/ Low Rider**	**Low Cost/ High Rider**	**High Cost/ High Rider**
7 Days – 2x Day	15.69%	46.41%	14.63%	43.29%
7 Days – 3x Day	23.53%	69.93%	21.95%	65.24%
5 Days – 2x Day	11.11%	47.06%	10.37%	43.90%
5 Days – 3x Day	16.34%	70.59%	15.24%	65.85%

Table 18: South Route – Percentage of Potential Riders Needed for Cost Recovery - 1 mile				
	Low Cost/ Low Rider	**High Cost/ Low Rider**	**Low Cost/ High Rider**	**High Cost/ High Rider**
7 Days – 2x Day	10.76%	31.84%	10.04%	29.71%
7 Days – 3x Day	16.14%	47.98%	15.06%	44.77%
5 Days – 2x Day	7.62%	32.29%	7.11%	30.13%
5 Days – 3x Day	11.21%	48.43%	10.46%	45.19%

Ridership Calculation Methodology

The estimated population values utilized in these analyses were calculated by multiplying the number of residential addresses by the average household size as reported by the U.S. Census Bureau American Community Survey for Houghton County. This value was 2.5 persons per household as reported in 2021 5-year estimates.[6] The potential number of individuals aged 16 and older was calculated by multiplying the estimated population from the previous step, by a value of .818 which was the reported percentage of individuals in Houghton County greater than age 16 as found in 2021 ACS 5-year estimates.[7]

Two additional data sources were utilized to identify index values that could be applied to these population values to estimate ridership. Table S0802 'Means of Transportation to Work by Selected Characteristics' utilizing 2021 ACS 1-year estimates for the United States show that 2.46% of the population utilizes public transportation (excluding taxicabs) to commute to work. [8] This includes all modes of public transportation and is used as the 'high' value in the tables above. In 2019 the U.S. Census Bureau released a report entitled 'Commuting by Public Transportation

[6] Houghton County Michigan, 2021 ACS 5-Year Estimates, Table S1101 Households and Families. https://data.census.gov/table?q=houghton+county+michigan&tid=ACSST5Y2021.S1101

[7] Houghton County Michigan, 2021 ACS 5-Year Estimates, Table S101 Age and Sex. https://data.census.gov/table?q=houghton+county+michigan&tid=ACSST5Y2021.S0101

[8] United States, 2021 ACS 1-Year Estimates, Table S0802 Means of Transportation to Work By Selected Characteristics. https://data.census.gov/table?q=means+of+transportation+to+work

in the United States: 2019' which provides greater detail on commuting modes for U.S. citizens. The report states that 2.3% of workers aged 16 and over utilized public transportation, and specifically busses, as their means of transportation to work.[9] This value is utilized as the 'low' value in the tables above.

Summary

Based on available cost data reported to the National Transit Database (NTD) the locations of Michigan Technical University employees and students, as well as the disbursement of other residents in communities across Houghton County, the proposed expanded north and south transit routes as conceptualized here are generally feasible.

The information in this report is presented for planning level analysis and discussion purposes as developed by the NADO/WTI research team as part of this USDA funded technical assistance project. Further efforts to verify assumptions of service demand and consumption made here are strongly recommended prior to seeking funding for establishment of additional services.

[9] Burrows, M., Burd, C.; McKenzie, B. (2021). (rep.). Commuting by Public Transportation in the United States: 2019. Washington, District of Columbia: United States Census Bureau.

Appendix C

REQUEST FOR PROPOSALS

HOUGHTON/HANCOCK TRANSIT CONSOLIDATION STUDY

CITY OF HOUGHTON, MICHIGAN

Appendix C

Request for Proposals

Houghton/Hancock Transit Consolidation Study

Introduction

The City of Houghton is soliciting proposals from qualified individuals, firms, partnerships, and corporations to study consolidation of public transportation services for the Cities of Houghton and Hancock, as well as expansion of service outside of the cities to additional parts of Houghton County. Public transportation service is currently provided by several separate entities within this geographic area, including the City of Houghton, the City of Hancock, Michigan Technological University, and the Baraga-Houghton-Keweenaw Community Action Agency. These separate services are provided to distinct constituents based on community residence or affiliation and are currently not coordinated. As a result, these services are overlapping and/or duplicative, and limited in size and efficiency.

The purpose of this RFP is to identify a consultant with the resources, experience, and vision to work with the City of Houghton and the City of Hancock, as well as additional entities in the area such as Michigan Technological University and the Western Upper Peninsula Planning & Development Region, to study consolidation of public transportation service for the Cities of Houghton and Hancock as well as opportunities for greater coordination among additional providers and expansion of service to additional areas of Houghton County. The City envisions a multi-phase or multi-tiered evolution of public transportation service coordination and consolidation, with initial consolidation focused on the services currently provided in the regional core by the Cities of Houghton and Hancock. Because a consolidated transit authority could offer an improved organizational structure, the project will entail evaluation of governance alternatives as well as evaluation and assessment of consolidated transit services and programs.

Service Area

The City of Houghton is located along the Keweenaw Peninsula in Michigan's Western Upper Peninsula and had a population of 8,386 in the 2020 Decennial Census. Across the Portage Waterway is the City of Hancock, which had a population of 4,501 in the 2020 Decennial Census. Michigan Technological University (MTU) is a public university and major regional presence located within the City of Houghton and had a student body (including full- and part-time undergraduates and graduates) of 7,074 and a total of 1,580 non-student staff in Fall 2022. Approximately 2,000 MTU students live in on-campus housing, with the remainder of students living in Houghton, Hancock, and other parts of the region, including Chassell and Calumet. MTU currently operates its own transit service.

Appendix C

Service Information

The City of Houghton's public transit service includes fixed route and demand response buses and provided 20,319 unlinked passenger trips with $550,861 in total operating expenses in 2021. The City of Hancock's public transit service includes demand response buses and provided 15,306 unlinked passenger trips with $277,031 in total operating expenses in 2021. Houghton's fixed routes average 5.8 unlinked trips per vehicle revenue hour at an average of $17.43 in operating expenses per unlinked passenger trip, while the demand response vehicles average 1.1 unlinked trips per vehicle revenue hour at an average of $37.23 in operating expenses per unlinked passenger trip. Meanwhile, Hancock's demand response vehicles average 3.0 unlinked trips per vehicle revenue hour at an average of $18.10 in operating expenses per unlinked passenger trip.

Service Vision

Transit consolidation for the Cities of Houghton and Hancock could eliminate duplication of services, streamline intercity trips, and make resources available for improved and expanded services – such as expanded evening and weekend service. In addition, expansion of service to include areas beyond the Cities of Houghton and Hancock could serve residents in additional parts of Houghton County, including those who rely on the region's core cities for employment, education, healthcare, and shopping. A combined transit authority could ensure streamlined administration and operations.

Scope of Work

The Houghton/Hancock Transit Consolidation Study will evaluate governance and organizational structure alternatives, analyze consolidated service scenarios, explore opportunities for, and logistics of, potential geographic expansion of services, and formulate recommendations for the implementation of transit consolidation.

TASK A: Service Consolidation Scenarios

Analyze existing transit services, conditions, and characteristics of the Houghton/Hancock service area to identify scenarios under which services may be consolidated. Analysis should include service, funding, and management options for each identified scenario. These considerations should include not only direct service offerings, but also a review of governance and organizational structure alternatives, including formation of a public transportation authority under Michigan Act 196 of 1986. Final deliverables for this task should identify service planning and delivery considerations, administration and management staff recommendations, funding options, implementation steps, and tradeoffs for each alternative.

TASK B: Service Expansion Scenarios

Building upon consolidation of the existing providers and services in the cities of Houghton and Hancock, options for and feasibility of incremental expansion of services and service areas shall be analyzed. This expansion of service shall include, in a phased approach:

- First, expansion of services to core unincorporated areas of neighboring townships.
- Second, further expansion of services to more outlying areas of the county, up to what may be considered “countywide” service.

Notwithstanding potential service expansion beyond city boundaries, the consolidation of services explored in Task A shall be detailed such that it may be implemented independently without any expansions envisioned in Task B.

TASK C: Recommendations for Implementation

Informed by the findings of Tasks 1 and 2, compile recommendations for the cities of Houghton and Hancock to consider for implementation of transit consolidation and/or expansion. These recommendations should consider the needs of the general traveling public as observed during the research phases of this project.

OPTIONAL – TASK D: Public Outreach Activities

Project partners are interested in undertaking outreach to key stakeholder groups including seniors, individuals with disabilities, students, employers, and other groups that traditionally utilize or depend on transit services. This task is listed as optional as other concurrent planning efforts may sufficiently address this task; however full details were not available at the time of this RFP. Please be prepared to address this as an included activity if it is relevant to your project approach, or as an additional fee task.

Expectation of Award

The maximum anticipated cost of these services as described is $100,000. Funding is provided via grant awards from the Federal Transit Administration (FTA) and the Michigan Department of Transportation.

Period of Performance

The period of performance for this activity shall be December 1, 2023 through October 1, 2024. All final invoices and final project closeout materials must be complete and submitted to the City of Houghton by this date.

Evaluation and Selection

The City of Houghton will evaluate proposals on a qualitative basis. This includes review of the proposal documents, and related materials, results of discussions with other clients and references, and the firm’s completeness and timeliness in its response to this RFP. If needed, interviews with project staff to be assigned to this project could be requested if additional information or clarification is needed after review of submitted materials.

Submission of Proposals and Required Response Materials

All responses to this RFP are due by 5:00 p.m. EDT, November 15, 2023.

Appendix C

All response materials must be submitted via email in digital format including any images, charts, maps, and narrative descriptions. All information shall be submitted to City Manager Eric Waara at eric.waara@cityofhoughton.com. Please use the subject line 'TRANSIT CONSOLIDATION STUDY' when sending any email correspondence regarding this RFP opportunity.

Questions & Requests for Information

Questions regarding this RFP or requests for additional information should be directed to City Manager Eric Waara at eric.waara@cityofhoughton.com. Please use the subject line 'TRANSIT CONSOLIDATION STUDY' when sending any email correspondence regarding this RFP opportunity.

Terms & Conditions

The City of Houghton reserves the right to accept or reject any and all responses to this RFP and to readvertise for new submissions.

The City of Houghton will not be responsible for any costs incurred by respondents related to the effort required to respond to this RFP.

The City of Houghton reserves the right to delay or discontinue the selection process at any time.

The City of Houghton reserves the right to award all, part, or none of the project in the best interest of the overall project and will not be held responsible for any impact on respondents resulting from this decision.

The City of Houghton reserves the right to request modifications to any documentation submitted if it is in the best interest of the project prior to the time of selection.

The City of Houghton reserves the right to request clarification or additional information from a respondent prior to selection.

The City of Houghton reserves the right to negotiate with the selected respondent to provide additional services not outlined in this RFP if necessary and in the best interest of the project.

This RFP is the official documentation governing proposal procedures. No other documents, letters, or oral instructions shall have any influence unless incorporated by reference herein or unless an official amendment is made to this document by The City of Houghton.

Evaluation criteria contained herein shall be used in evaluating respondents for selection. The City of Houghton may contact any RFP respondent after receiving its submission to seek clarification on any portion thereof.

Proposal materials will not be returned to RFP respondents.

Transit Governance Survey

The National Association of Development Organizations (NADO) in partnership with the Western Transportation Institute at Montana State University are seeking feedback on transit governance models from communities across the United States.

This information is being collected to provide assistance to interested communities seeking to establish, expand, or consolidate transit services.

* This form will record your name, please fill your name.

Contact Information

This information will be utilized to catalog responses and to provide respondents with updates to this survey form or the larger survey effort.

1. Name of responding agency:
   Please include city and state.

2. Contact Name:

3. Contact Email:

Transit Agency Background

4. How would you characterize your service area?

- ◯ Primarily rural areas serving small communities
- ◯ Mix of rural and urban areas
- ◯ Primarily urban/metropolitan areas

5. How many communities does your agency serve?

E.g. primarily one community, a number of communities in a regional system, or a number of towns/townships.

6. What are the major program areas or funding sources utilized by your agency?

This can include Federal Transit Administration section 5311, 5310, 5307 programs, non-emergency medical transportation, or others.

7. What types of transportation does your agency provide or administer?

- ☐ Fixed Route/ Deviated or Flexible Fixed Route
- ☐ Demand Response
- ☐ Mircotransit or on-demand premium transit
- ☐ Vanpool
- ☐ Paratransit
- ☐ Commuter transportation
- ☐ Volunteer transportation
- ☐ Other

8. Which of the following describes your transit agency or service?

- ◯ A program within a Tribal government
- ◯ A program within a city or county government
- ◯ A program within a regional development organization or council of governments
- ◯ A program within a state government agency
- ◯ A program within a larger nonprofit with multiple program areas (such as a transit program housed within a Community Action Agency)
- ◯ A separate or standalone public sector agency (primary or only purpose being public or community transportation)
- ◯ A standalone nonprofit agency (primary or only purpose being public or community transportation)
- ◯ Other

Transit Agency Governance

9. If your organization is a program within a larger organization (such as government or nonprofit), what kinds of governing structures does the transit program have?

- ◯ A transit program-specific governing commission or board of directors
- ◯ Government officials (Tribal council, state transportation commission, county commission, or city council)
- ◯ The board for the larger agency/organization (such as the board of a nonprofit or council of governments that have multiple program areas)
- ◯ Other

10. How many members are on your transit governing board?

11. How are the members selected/appointed?
For example, is your board structure governed by state statute or other external authority?

12. Are there term limits, and if so, how long are the terms?

13. Does your board utilize officers or an executive committee?

14. Does your board permit or utilize member proxies?

- ◯ Yes
- ◯ No

15. How many board members must be present for a quorum?

16. How are board seats filled in the case of resignation or other sudden removal?

17. How are board members allocated?
E.g. by profession, industry, geographic location, etc.

18. Are board members required to reside within the transit service area?

- ◯ Yes
- ◯ No

Relationships Between Transit Agencies

19. Has your transit organization merged/combined with another transit organization in the past?

- ◯ Yes
- ◯ No

20. Please briefly describe the merger.

This would include any details including the original agencies, combined board status, combined staff status, success stories or challenges.

21. Are there other transit entities operating in the jurisdictional area of your transit board?

- ◯ Yes
- ◯ No

22. Does your organization take steps to coordinate service, reduce duplication, or partner in some way with these other agencies?

- ◯ Yes
- ◯ No

23. What are some examples of coordination efforts that have been attempted or contemplated?

24. What challenges or opportunities for further coordination between entities exist?