Northwestern Michigan College

Five-Year Capital Outlay Plan

Fiscal Year 2026

Submit to the
NMC Board of Trustees
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NORTHWESTERN MICHIGAN COLLEGE
FIVE-YEAR CAPITAL OUTLAY PLAN
FISCAL YEAR 2026

Northwestern Michigan College (NMC) was the first comprehensive community college chartered in the state of Michigan in 1951. Since its founding, NMC has provided quality, affordable access to higher education for learners of all ages and backgrounds. NMC is integrally woven into the economic, social and cultural fabric of the region, providing leadership and support for key initiatives that shape our communities and prepare our learners for rich and meaningful lives.

NMC provides programming at five principal sites in Traverse City:

- **Front St. Campus** located in Traverse City on East Front Street at the base of the Peninsula
- **Great Lakes Campus** located at the base of West Grand Traverse Bay
- **Aero Park Campus** located in the Traverse City airport industrial park
- **University Center Campus** located on Boardman Lake off of South Cass Street
- **Rogers Observatory** site located in Garfield Township a few miles South of Main Campus

I. Mission Statement

Mission
Northwestern Michigan College delivers lifelong learning opportunities to transform lives and enrich our communities.

Vision
We aspire to be a global community where all learners unlock their full potential.

Values
Our individual and collective efforts create the legacy of NMC. In order to achieve our mission, we are individually committed and responsible to live these values:

- **Learning**: We are lifelong learners; learning is foundational to a thriving community and is at the center of all we do.
- **Integrity**: We act with the highest degree of ethics, personal responsibility, fairness and openness ensuring that we match our actions with our words.
- **Collaboration**: We embrace co-creative solutions and celebrate the joy of working together, empowering each other and nurturing community partnerships for the benefit of our learners.
- **Respect**: We demonstrate mutual regard and appreciation for one another to assure a culture of trust.
- **Inclusion**: We foster belonging and build organizational capacity that celebrates diversity and promotes equity.
- **Innovation**: We are agile, imaginative and forward thinking, taking risks to meet future needs of the college and our communities.
- **Stewardship**: We practice stewardship by investing responsibly in the human, physical, financial and environmental resources entrusted to our care.
- **Excellence**: We commit to the highest standards of quality and service, and to exceeding the expectations of our learners and communities through continuous improvement.

Purposes
To meet our mission, we are fully engaged in each of the following purposes, with the result that our learners meet their goals of being college-ready, transfer-ready, career-ready, and ready for lifelong-learning:

- Associate degree, certificate, and transfer education in liberal arts and sciences and occupational studies
- Career/occupational education and workforce development
- Bachelor degrees in select programs
- Cultural and personal enrichment
- Baccalaureate and graduate program facilitation
- Regional economic development

Strategic Plan Initiatives
In order to accomplish NMC's stated Mission, Vision, and Purposes, organizational activities focus on achieving the following strategic goals:

- **Future-Focused Education**: Enhance offerings through flexible academic pathways, innovative instructional delivery models and relevant, hands-on educational experiences to empower global learners for the future.
- **Student Engagement and Success**: Develop and deliver comprehensive support services, robust engagement opportunities and a vibrant collegiate experience to foster learner success, goal completion and employability.
- **Diversity, Equity and Inclusion**: Cultivate an inclusive environment that fosters a sense of belonging and delivers equitable opportunities so all are able to thrive and succeed.
- **Community Partnerships and Engagement**: Enhance collaborations that advance community engagement, economic and workforce development and innovative opportunities for lifelong learning.
- **Institutional Distinction and Sustainability**: Leverage distinctive programs that strengthen institutional sustainability and expand global connections for our learners and communities.

II. Instructional Programming

At NMC, you'll find more than 60 areas of academic study, all of which feature dedicated faculty, small classes and personal attention. NMC offers transfer courses, bachelor's degrees in select areas, two-year associate degrees and professional certificates, with access to BA and advanced degrees through our University Center partners. To provide flexible learning options and more accessibility for our students, we offer a variety of traditional in-person, online, and hybrid courses.

As part of our capital outlay planning process, we assess our current academic programs, ongoing College initiatives, regional and national workforce needs, and trends in delivery to help determine our academic facilities and infrastructure needs. Section II-A addresses current academic programming and future growth.

II-A. Describe existing academic programs and projected programming changes in the next 5 years in so far as academic programs are affected by specific structural considerations (i.e. laboratories, classrooms, current and future distance learning initiatives, etc.)

See this link for an A-Z listing of NMC's current programs: https://catalog.nmc.edu/programs-az/

New and Projected Programming Changes

Changes to NMC's programming and other offerings are influenced by the following factors:

- Current and projected enrollment and industry trends
- Community workforce needs
- Contributing to the economic development of our region
- Improving the success rates of our learners
- Ensuring the fiscal stability of the College

NMC has developed the following certificates and programs during the last five years:

- Culinary-Baking and Pastry Arts—Level II Certificate (Fall 2022)
- Engineering, Associates of Science in Engineering (Fall 2021)
- Surveying—AAS (Fall 2019)
- Maritime Culinary Certificate (Fall 2023)
- Uncrewed Aerial Systems (UAS) - AAS (Fall 2023)
- Water Quality and Environmental Technology—AAS (Fall 2023)
- Nursing Articulation Agreement—ADN to BSN (Fall 2023)
- Esports Management - Level I Certificate (Spring 2024)
- Computer Support Specialist - Level I Certificate (Spring 2024)
- Sports Performance Nutrition Certificate (Fall 2024)

As the College assesses current and future programming, we consider the related capital, structural, and technology needs to ensure we can deliver every program effectively on our campus facilities and/or virtually. Our Strategic Plan contains five Strategic Plan Initiatives (See Section I) and twenty-three underlying strategic objectives. The following are examples of objectives relevant to the College's capital planning considerations:

Future-Focused Education

- To increase the College's proportion of online courses from 28% to 35% by 2024.
- Create six accelerated course pathways in multiple academic disciplines by 2024.

Student Engagement and Success

- To Increase the percentage of area high school graduates attending NMC by 3% by 2024.
- To increase enrollment by 10% in age categories 21+ by Spring 2024.
- Enhance student completion support to increase the 3-year completion success rates by 2025
- Increase the percentage of students using success coach services by 3% by 2025.

Institutional Distinction and Sustainability

- Aviation will execute its multi-phase expansion plan to increase program enrollment by 25% by 2026. The multi-phase expansion plan includes a large expansion of our hangar.
- Our Great Lakes Maritime Academy and Great Lakes Culinary Institute have instituted a maritime culinary certificate. The first cohort graduated in 2024.
    - We intend to use the galley aboard our maritime vessel *T/S State of Michigan* as our primary learning lab. As this program grows to its potential, we plan to construct a simulation galley lab in our Great Lakes Building.

II-B. Identify the unique characteristics of each institution's academic mission.

Northwestern Michigan College is recognized by members of its service district and various accrediting agencies for unique characteristics and special programming that are a part of the fabric of the college.

These include:

● Aviation Division (Pilot Training Program)	● International Partnerships
● Audio Technology Program	● Joseph H. Rogers Observatory
● Center for Instructional Excellence	● Math Center
● Child Care Center on Campus	● Michigan Energy Demonstration Center
● Commitment Scholarship Program	● Military and Veteran Services
● Construction Technology Program	● Marine Center
● Dennos Museum Center (DMC)	● NMC Foundation
● Dental Assisting Program	● Online Nursing
● Early Colleges	● Outdoor Sculpture Collection
● Engineering Technology	● Phi Theta Kappa
● Entrepreneurial Studies	● Remote Operated Vehicle Training (Marine)
● Esports	● Service Learning
● Extended Educational Services	● Student Success Center
● Global Endorsement	● Surgical Technology Program
● Great Lakes Culinary Institute	● Tutoring Center
● Great Lakes Maritime Academy	● Uncrewed Aerial Systems Training
● Great Lakes Water Studies Institute	● University Center
● Health Education Institute	● Writing and Reading Center
● International Affairs Forum	● WNMC-FM Radio Station
● International Services	

Below are brief descriptions for some of these unique characteristics and special programs.

Aviation Division

Established in 1967, Northwestern Michigan College has a proven background in delivering safe and effective flight training to generations of pilots. Today, the Aviation Division operates an FAA approved Part 141 training facility, has established exclusive training agreements with (5) international universities to provide flight training in Traverse City, and offers extensive hands-on training on several different uncrewed Aerial Systems platforms.

The professional pilot program currently operates at maximum student capacity, training 125 full time students in a diverse fleet of 15 aircraft valued at more than $7.5 million. The Aviation Division has

established numerous hiring partnerships with regional airlines, allowing graduates direct routes to employment opportunities.

In 2011, the Aviation Division launched Michigan's first uncrewed Aerial Systems (UAS) program, with focus on preparing UAS operators to meet the needs of a rapidly growing industry. In 2015, NMC was named one of the *15 Best Drone Training Colleges in America* and was the only community college listed in the top 10.

One of the 2015 recipients of the Community College Skilled Trades Equipment Fund (CCSTEF), the UAS Department now maintains a fleet of commercial-grade uncrewed aircraft designed to meet the training and experience demands of today's (and tomorrow's) employers.

Great Lakes Maritime Academy

Established in 1969, the Great Lakes Maritime Academy (GLMA) is one of only seven maritime academies in the United States that is federally regulated under 46 Code of Federal Regulations 310. These regulations allow for a holistic approach which allows GLMA to accept a cadet with no prior seagoing experience and within four years he or she can complete both a bachelor's degree and earn a merchant mariner's credential valid for service on large tonnage vessels which are in ocean or Great Lakes service.

All GLMA cadets must complete one course in Naval Science which is delivered by active duty Naval personnel. Those cadets that are accepted into the U.S. Navy's Strategic Sealift Officer's program complete an additional two classes in Naval Science, earn a commission as a Naval Officer, and are awarded $32,000, by the U.S. Navy, over the course of their four years at the academy.

In August 2002 the U. S. Maritime Administration (MARAD), at the request of Michigan's Governor, transferred operation of the *USNS Persistent (T-AGOS-6)* to GLMA where she was rechristened the *T/S State of Michigan*. Since that time the vessel has been an integral part of the Academy's training program. The following are just a few examples of the value-added by the *T/S State of Michigan* vessel:

- Having the use of the training ship ensures that GLMA cadets can accrue requisite sea service required for graduation and licensure.
- GLMA has been able to ensure the curriculum meets both the U.S. law as described in 46 CFR, and also be in full compliance with the complex international treaty Standards for Training, Certification and Watchkeeping for Seafarers (STCW Code).
- By having cadets complete their first sea project on the *T/S State of Michigan*, they are fully versed in shipboard culture prior to being assigned a berth on a commercial vessel as part of subsequent sea project (cadets must complete three sea projects). This has greatly improved retention.
- The T/S State of Michigan serves as a dockside laboratory for courses of instruction in diesel engines, shipboard auxiliary systems, air conditioning and refrigeration, firefighting and damage control, stability, and navigation, just to name a few.
- Interdisciplinary uses of the ship being studied include collaboration with the Great Lakes Culinary Institute (GLCI). These collaborations have resulted in several graduates from GLCI earning Merchant Marine Credentials in addition to their Associate's degree, thus greatly expanding employment opportunities. The vessel's galley will also be used to provide a training lab for the College's maritime culinary certificate program launching in Fall 2023.

The Michigan Legislature passed House Bill 4496 enabling Michigan community colleges to offer a select number of baccalaureate degrees, among them a Bachelor of Science degree in Maritime Technology on December 13, 2012. The Governor signed the bill into law on December 27, 2012.

In April 2013, the NMC Board of Trustees authorized the college to offer the Bachelor of Science degree in Maritime Technology program and supported the administration to seek approval of the Higher Learning Commission to authorize the college to offer the degree.

In December 2023 , the United States Coast Guard reapproved the Academy's programs. It is now approved throughJanuary 2029 , and certified as meeting the requirements of the international treaty STCW Code. This includes the most recent amendment to the STCW Code.

Great Lakes Water Studies Institute

The Great Lakes Water Studies Institute (GLWSI), located on the Great Lakes campus, delivers programs and conducts research directly related to the area's most important natural resource. Students may focus on multiple areas of water technology and science including water quality, environmental remediation, or may focus in marine technology including applied technical work in support of the marine industries involving the calibration, deployment, operation, maintenance, and management of marine technology assets, including data collection, processing and mapping, for use in the marine environment both offshore and onshore.

In fall 2015, the GLWSI officially launched NMC's third Bachelors of Science in Maritime Technology major in the area of Marine Technology. This program is unique to the United States and one of the only in the world and builds directly on the AAS marine technology program. Specific training emphasis includes remotely operated vehicles (ROV) and marine platforms, marine acoustics and sonar, marine data processing and project management. Multiple industry collaborations allow graduates a broad range of career opportunities. To date, all graduates of this program have found direct employment in the Marine Industry immediately upon graduation. The Great Lakes Water Studies Institute also offers professional development opportunities in sonar training for industry and government partners including the United States Army Corps of Engineers, Office of Naval Intelligence, and the National Oceanographic & Atmospheric Administration. Since 2015, ROV training at NMC has been certified through the Association of Diving Contractors International (ADCI).

The Great Lakes Campus site includes a water analysis laboratory for student experiments/labs, qualified environmental research organizations and university partners. Students work aboard the 56-foot *R/V Northwestern* or the 21-foot *R/V Hawk Owl* in Grand Traverse Bay, Lake Michigan and the inland waters of Michigan. The Great Lakes campus harbor also serves as a year-round laboratory where training occurs from NMC's pier. The GLWSI is also home to two advanced Remotely Operated Vehicle systems, multiple sonar systems, advanced GPS and water quality sampling equipment. Additionally, there is a 60,000 gallon indoor training tank located at NMC's Aeropark campus for year-round, climate-controlled operations.

In 2014, collaboration with Western Michigan University (WMU) led to the joint development of a bachelor's degree completion program in Freshwater Science and Sustainability. In September 2015, Northwestern Michigan College officially started delivery of the third Bachelor's Degree in Maritime Technology major in Marine Technology.

The GLWSI is involved in multiple Great Lakes research projects with university and government partners and also collaborates globally with multiple institutions in many areas of water and the marine environment. MOU's with institutions in China, Colombia, Costa Rica, Indonesia have generated additional water opportunities for students.

In 2023, GLWSI launched an AAS in Water Environmental Quality Testing technology designed to meet the growing workforce needs for supporting the restoration and remediation of impacted groundwater and other environmentally compromised sites.

Great Lakes Culinary Institute

This program provides rigorous and concentrated study for those students who plan careers in the rapidly growing food service industry. The program's main emphasis is to prepare students for positions as entry-level chefs and kitchen managers. Consideration is given to the science and techniques associated with the selection, preparation and serving of foods to large and small groups. Students further develop their knowledge of food and guest service through internships at area restaurants, hotels and resorts. The program includes an Institute-run training restaurant, Lobdell's, which greatly enhances the level of restaurant experience of graduates. The facility provides five kitchen "laboratories" including Lobdell's, a training restaurant, which is a critical component of a top quality culinary program.

The GLCI is also pursuing collaboration with other learning opportunities. In an effort to enhance student retention, culinary certificate programs have been implemented. For years, the Culinary Institute has provided lifelong learning and professional development offerings in collaboration with other areas of the College. The expanded facilities, with its lakefront location, have been leveraged to create world-class food and wine events, open to the public. All events have served to showcase Michigan agricultural and value-added agricultural products.

The American Culinary Federation Education Foundation Accrediting Commission accredits Great Lakes Culinary Institute programs, one of only approximately 400 such schools to receive this program accreditation in the United States. In 2018, the Great Lakes Culinary Institute received a five-year program accreditation by the American Culinary Federation Education Foundation. Upon completion of the Great Lakes Culinary Institute program, students are eligible for certification through the American Culinary Federation.

The GLCI has also developed a maritime culinary certificate in partnership with our Great Lakes Maritime program. The certificate program became available in Fall 2023, and will provide high-earning opportunities for culinary professionals in the maritime industry.

Construction Technology

During the 2009-2010 academic year, NMC received authorization to offer four new level I certificates and one AAS degree in Construction Trades. These certificates include HVAC/R installation and service, Electrical, Plumbing and Carpentry. For students that complete any one of these four certificates, we have developed appropriate construction trades courses to customize their degree requirements for the remainder of the trades courses and infuse the required general education courses to achieve the sixty four credits required to complete an AAS degree. In January of 2022, an audit of the construction technology program by the NCCER established a third party credential available to students enrolled in

the Electrical and HVAC programs. This credential is recognized nationally as both academic and experiential progress in the applicable trade. Additional trade areas, like carpentry, are being slated to also be included in this accredited NCCER program. Students in this program have the option to include a specialization in renewable energy with options in residential and light commercial solar PV, solar thermal, wind installation, including both net-metered and independent installations. A certificate in Programmable Logic Controls (PLC) has been developed and available to students since Fall 2014.

Engineering Technology

In 2011, a new associate degree in Engineering Technology offered students a broad-based curriculum across all areas of technical education, preparing the graduates for emerging job markets and highly technical fields. The program is designed to allow students to focus on areas of interest or specialize in one of five technical specializations: Computers, Electronics, Marine, Robotics & Automation, and uncrewed Aerial Systems. In 2018, a new specialization was added to the degree pathway that is focused on Biomedical Equipment Technologies. Partnering with Leica Geosystems, an AAS degree in Surveying was added in 2019 to serve the growing demand for surveying technicians in the region.

Engineering technology education focuses primarily on the applied aspects of science and engineering aimed at preparing graduates for practice in that portion of the technological spectrum closest to product improvement, manufacturing, robotics, uncrewed systems, and engineering operational functions.

Parson-Stulen Building

In 2015 Northwestern Michigan College was awarded a $2.8MM grant from the State of Michigan in support of the Community College Skilled trades Program Fund (CCSTEP). $2.1 MM dollars from the grant was used to purchase equipment and renovate facilities in support of the Colleges Engineering Technology, Marine Technology and Computer Technology programs. This included an advanced electronics lab and marine technology, 60,000 gallon indoor test tank, a state of the art remote operated vehicles, three uncrewed aerial platforms, and flight simulators.

Aero-Park Laboratories

In 2011, NMC opened the Aero-Park Laboratories (APL) building at the Aero-Park Campus as a companion facility housing laboratories for construction technology, renewable energy, engineering technology and welding. APL is a 29,600 sq. ft. facility which allows a variety of configurations to accommodate large group lectures as well as individualized student space or small team project areas. The facility is LEED certified and equipped to support a high level of instructional technology requirements and welding facilities.

Audio Technology

An associate program in applied audio technology/technician was approved in July 2012 to meet the needs of students entering the recording, editing, and live music engineering specializations of the music industry. At the core of the degree program are training and certifications in Logic-Pro (Apple) and Pro Tools (Avid) - the industry standard software for recording and editing. Students also have practical real-world experience in studio and live recording, sound design, composing, mixing, mastering, and live sound. All of the Audio Tech instructors are certified on various software, and also bring to their instruction their vast experience as performers and professionals in the music industry. NMC's Audio

Tech program remains on the cutting-edge of technology as the first program in the U.S. to possess new mixing and routing hardware.

Commitment Scholarship Program

The NMC Commitment Scholarship Program was developed to encourage academically promising students with financial need to successfully complete high school and enter college. The program began in 1993, and has included more than 1,000 first-generation college students from 19 participating high schools. Each fall, 40-50 new students are inducted from the region to engage in activities that support successful educational attainment. The students, in partnership with the parents and high schools, commit to regular participation in the program activities, demonstration of good citizenship, and completion of high school with a minimum of a 2.5 grade point average.

On-Campus Residence Life Opportunities

The Residence Hall Living/Learning program at NMC is one of ten residence hall programs offered at the community college level in Michigan. Student and professional staff provide peer social programs, educational seminars, and community service opportunities. The Residence Halls are alcohol/drug free zones except for designated suites in North Hall where all residents are over 21 and agree to special restrictions. Affordable housing is limited in the Traverse City area which is reflected in our growth in the number of students living in the halls and apartments in the past several years. Having reached capacity in three consecutive years, the college opened a new residence Hall in August of 2017 expanding overall capacity to 370. There are also 36 apartments on NMC's main campus which are consistently full with a waiting list.

Extended Education & Training

Extended Education & Training provides three major programs to the community - Work & Career; Life Enrichment; College for Kids. Additionally, they provide four large areas of support to the college - recruitment, engagement with donors, cross-listed academic classes for the community, and college initiatives. On an annual basis, Extended Education & Training offers nearly 1000 continuing education, adult enrichment, and youth learning opportunities in multiple formats - online, hybrid and in-person, and annually serves nearly 3500 individual students.

Continuing Education Certificate programs available include Northern Naturalist and Global Certificates for Life Enrichment. For Work & Career programming, they offer certificates in Business Development, Eldercare, Google Data Analytics, Personal Trainer, Microsoft Office, Adobe Creative Suite, Quickbooks/Bookkeeping, Paralegal, Medical Assistant, Medical Billing & Coding, and Certified Nurse Assistant program which are in high demand with area employers. They also offer MIOSHA safety training, training in various computer/technology areas, and soft skills for professional development. Extended Education & Training engages with area employers to fill their custom training and retreat needs for a variety of topics including leadership, management, nutrition, culinary, and manufacturing skills.

- Work & Career
    - Skill-credentials & Certifications
    - Professional Development
    - Custom Training & Retreats

- Life Enrichment
    - Culinary
    - Fitness, Dance, Wellness, Yoga, Recreation
    - Global Certificate, Culture, Religion
    - International Tours
    - Music
    - Northern Naturalist Certificate
    - Writing & Communications

- College for Kids
    - Summer programs
    - School year programs
    - NMC Children's Choir

Extended Education & Training Provides College-wide Support:

- Recruitment
    - Offer "stepping stone" non credit classes like Welding Fundamentals, that can bring students over into credit programs
    - 12% of NMC students were College for Kids students
    - Marketing
        - Over 12K Enews subscribers
        - Over 2,500 social media followers
        - Catalog delivered 3X year to over 45,000 households each time

- Fundraising
    - 14% of Extended Education & Training students are donors to the college
    - Provide programming such as international tours to NMC's donor audience

- Cross-listed Class
    - Offer over 40 academic credit classes annually for community non credit enrollment
    - Contributes to the cost to educate model and enriches classrooms with diverse students

- College Initiatives
    - Benzie Annexation Process (expired in Sept. 2024)
    - College wide initiative grant writing & special programming

University Center

The mission of NMC's University Center is to facilitate the delivery of high quality programs and course offerings beyond the associate degree to northwest Michigan residents as deemed desirable by the citizens of the region. The University Center is a unique partnership between Northwestern Michigan College and five participating universities. NMC offers associate degrees in over 40 liberal arts, health, business, education, and technical programs. The partnering universities offer courses required for the completion of the final two years of selected bachelor degree programs, complete master's degree programs in selected areas, post-bachelor and graduate certificates, specialized endorsements, and one doctorate. University Center partners include: Central Michigan University, Davenport University, Ferris State University, Grand Valley State University, and Michigan State University.

Global Endorsement

Beginning in the fall of 2014, the college developed a cross-curricular endorsement for students who complete a variety of curricular and extra-curricular experiences that are recorded on an official college transcript. In part funded by the NMC Global Opportunity Fund, students take coursework, attend the college's Window on the World Week, Passport Student Lecture Series, and International Affairs Forum and even travel to international educational sites to receive credit towards this endorsement.

Dennos Museum Center

The Dennos Museum Center builds community, sparks conversation, and inspires change for audiences of all ages through its exhibitions, programs, and the collection and preservation of art. The museum serves as the region's premier cultural center for NMC students and faculty, K-12 school groups, and the general public through a diverse exhibition and program schedule.

The Museum cares for and curates a selection of semi-permanent exhibitions drawn from more than 3,000 works of art, with strong holdings in Canadian Inuit sculpture and prints, Midwestern regionalism, and Chinese and Korean contemporary artwork. Museum staff also oversee over one dozen outdoor sculptures installed throughout the NMC campuses.

Traveling exhibitions and loans from museums across the nation provide additional opportunities to connect faculty and students with object-based teaching and learning opportunities. Museum staff work with an advisory committee to curate exhibitions that directly support college initiatives connected to diversity and inclusion, interdisciplinary teaching and learning, global perspectives, contemporary socio-political issues of our time, and more. The museum—in the truest sense—is an opportunity for visitors to engage with artworks and artifacts that help us think about our role as globally minded citizens in the 21st century.

Additional facilities include the 367 seat Milliken Auditorium, which hosts a diverse series of lectures and performances throughout the year. The auditorium serves as a home base for the NMC Music Department, the International Affairs Forum, New Student Orientation, and College-wide programs and training opportunities.

Joseph H. Rogers Observatory

The primary function of the Northwestern Michigan College's Joseph H. Rogers Observatory is to serve as the laboratory facility for NMC astronomy students. It also provides educational opportunities for the community. The 1,500 square foot building, with two observing domes, stands as an example of this area's commitment to education. Constructed completely with donated funds, the Observatory houses astronomical equipment utilized for both education and research. The Observatory hosts Open Houses for the general public throughout the year with over 5,000 visitors annually. The Joseph H. Rogers Observatory is one of fifteen sites in the National Network of Project ASTRO™, a K-12 science education outreach program, and one of three sites chosen to host Family ASTRO™.

Marine Center – Professional Development

The Marine Center at Northwestern Michigan College provides comprehensive training solutions for the surveying and remote sensing industries. The focus of the programs is on the technical areas directly related to geospatial academic programs at the College: marine technology, surveying, engineering technology, and uncrewed aerial systems (UAS) programs. The Marine Center's focus is to meet workforce development needs within the targeted industry sectors (i.e. micro-credentialing, industry certifications, and competency-based training) using existing core technical capabilities and connections to the technical academic programs. Professional development and technical services associated with the NMC Marine Center programs continue to be an opportunity to raise awareness on key existing technical and academic programs at NMC, as well as provide a strong future revenue source.

The Hagerty Conference Center

The Great Lakes Campus is also home to the Hagerty Conference Center. The Center provides a flexible, technology-equipped space to accommodate seminars, classes, and specialized training in support of all NMC programs. The site also serves as a venue for professional development seminars for regional, national, and international businesses in addition to weddings and other private events. This enables NMC to increase its role in bringing new learning opportunities and new visitors to the region, thus providing economic growth and quality of life improvements. It also promotes further integration of programs within NMC, and enables NMC programs to draw on resources from outside the area to augment its own program offerings.

Child Care Center

In the summer of 2014, NMC partnered with Munson Healthcare to open a childcare center at the Oleson Center on NMC's main campus. NMC is a member of the 5toOne Initiative of the Great Start Traverse Bay Collaborative which has been working to create a comprehensive regional system for early childhood development programs. Munson Healthcare and Traverse Bay Area Intermediate School District (TBAISD) have also been included in these discussions and have been aware of our on-going concerns for NMC students as it relates to children's educational services. By partnering with Head Start and GSRP students who qualify are able to access free quality preschool services.

Key factors in this arrangement are two grant opportunities that provide a source of funding to pay for daycare services. The two grants awarded by the State of Michigan and available through TBAISD are the Great Start Readiness Program and Headstart. Munson allows families to call one week in advance to schedule time.

II-C. Identify other initiatives which may impact facilities usage.

The College has a unique opportunity to renovate its Osterlin Building into an innovative student services hub and welcome center. The College's library was recently relocated from the Osterlin Building to its new home on the 2nd floor of the Timothy J. Nelson Innovation Center. The vacancy of the library in Osterlin creates space to move the College's admissions, financial aid, health services, experiential learning, and other student activities into a centralized space. Consolidating those services into the Osterlin Building would create a "Student Services Hub", allowing students to access all academic and financial support services in one building. We believe this strategy would have a positive impact on student retention and completion.

The College's Strategic Plan also specifically calls for the expansion of our Aviation Division. This distinctive program, one of two major flight schools in the State, is currently at capacity with a waiting list of over 100 students. The only key barrier to its growth is lack of hangar space and training planes. A 10,000 square foot expansion of the hangar space could accommodate 8 additional training planes; each new training plane can accommodate 7-10 students. The College recognizes this unique opportunity to help immediately address a looming workforce shortage in the air travel industry.

In the next five-year period, the College expects to significantly expand programming for nursing and other health occupations. Continued growth in this area will require investment in additional simulation and teaching facilities. As the College continues projects designed to increase persistence and credential completion, it is adding instructional support activities that have an impact on experiential and supplemental instructional space. Finally, the College is embedding within the curriculum a multi-disciplinary approach to learning desired by employers. These initiatives require large interactive space that can be reconfigured for multiple uses. The College's current buildings do not accommodate this demand; renovation and additions to existing college buildings are necessary to stay agile as an institution.

The current priorities for facilities planning are focused on the following:

- Addressing deferred maintenance on existing buildings
- Increasing flexible and accessible classroom space
- Increasing flexible and accessible office spaces
- Reducing energy usage and creating sustainable infrastructure
- Creating housing opportunities to attract students

II-D. Demonstrate economic development impact of current/future programs.

According to a 2024 study by the economic modeling firm Lightcast, NMC creates a significant positive impact on the business community and generates a return on investment to its major stakeholder groups – students, taxpayers, and society.

- The analysis shows that in FY2021-FY2022, operations and student spending of NMC together with the enhanced productivity of its alumni, generated $204.5 million in added income, approximately equal to 2% of the GRP of the NMC Service Area, which is nearly as large as the Transportation and Warehousing Industry in the region.

- The impact of $204.5 million is equivalent to supporting 3,106 jobs

- Average annual rate of return for NMC students is 20.3%. This equates to $5.20 in higher future earnings for every $1 students invest in their education at NMC.

- Taxpayers provided $25.8 million of state and local funding to NMC in FY2021-FY2022. In return, taxpayers will receive an estimated present value of $32.8 million in add tax revenue streaming from students' higher lifetime earnings

See **Appendix A** for an executive summary of our 2024 Economic Impact Study. Some specific examples of NMC initiatives directed at regional economic improvement are highlighted below.

Technical Workforce and Career Development

NMC's Parson-Stulen Building houses a range of credit and non-credit programs that directly support training for key skills of high value to the region. Each major program area facilitates employer and community feedback through program Advisory Boards. In addition, faculty and staff participate in state, regional, and national organizations, and are directly engaged in research to help with development of appropriate programs and courses.

In collaboration with other workforce agencies and organizations, NMC has been able to respond to the need for incumbent worker training directly in the workplace, and in areas customized to employer needs. In addition, the technical workforce areas have prepared programs that can be quickly delivered to area communities where there is an identified need to prepare individuals for a specific labor pool. Recognized by the Governor's office in 2012, NMC is host to the Regional Entrepreneurial Collaborative – a partnership among NW Michigan Council of Governments, Small Business Technology Development Center, Score, Michigan Works, PTAK, Grand Traverse County Economic Development, Traverse Area Chamber of Commerce that supports collaboration between organizations to facilitate service for business development and expansion.

As part of the Extended Education Services department, NMC has been awarding industry recognized credentials meeting the demand of local employers. Custom training, designed specifically for the industry, has increased with EES educating over 200 employees of a local manufacturing facility. In addition, NMC has been working to blend credit and noncredit training making certificate achievement more attainable.

Michigan Manufacturing Technology Center

NMC is home to the Northwest regional office of the Michigan Manufacturing Technology Center. The purpose of the MMTC is to strengthen the competitiveness of small to mid-sized manufacturers through training and consulting services primarily through Lean Manufacturing and strategy assistance. The MMTC is part of a national network through the Department of Commerce's Manufacturing Extension Partnership and part of a statewide network of five offices.

Michigan New Jobs Training Program

Since authorization in 2009, NMC has been an active participant in the use of this economic development tool for community colleges. To date, NMC has developed contracts representing close to $10.7M in associated training, with over 1148 jobs in sectors including advanced manufacturing, value-added agriculture (food processors, distribution and retail), healthcare, insurance and construction.

Great Lakes Maritime Academy

The Great Lakes Maritime Academy (GLMA) cadets continue to experience 100% employment. This is partially due to the age of the maritime workforce on the Great Lakes which has resulted in numerous vacancies due to retirements. During the fall semester, recruiters from vessel operators and maritime unions visit the Academy weekly. Additionally, each cadet will complete three internships, two of which

will be on commercial vessels. These internships expose the cadets to different options, and allow the operators to see the quality of the cadets first hand.

Great Lakes Water Studies Institute

GLWSI officially launched NMC's third Bachelors of Science in Maritime Technology major in the area of Marine Technology. This program is unique to the United States and one of the only in the world. Specific training emphasis includes remotely operated vehicles and marine platforms, marine acoustics and sonar, marine data processing and project management. Multiple industry collaborations allow graduates a broad range of career opportunities. The GLWSI also offers professional development opportunities in sonar training for industry and government partners who travel from around the world to participate in these training programs. ROV training at NMC is certified through the Association of Diving Contractors International (ADCI) which will draw additional personnel to our programs.

The Great Lakes Campus site includes a water analysis laboratory for student experiments/labs, qualified environmental research organizations and university partners. The GLWSI is involved in multiple Great Lakes research projects with university and government partners and also collaborates globally with multiple institutions in areas of water and the marine environment.

Tourism and Hospitality Industries

Tourism and the hospitality industry are among the largest economic sectors in NMC's five county service area. The Great Lakes Culinary Institute directly supports that sector. There is a significant shortage of skilled professionals in this area. The Culinary Institute's ability to expand the programs that it offers is important to the area's economy.

Agribusiness

Agriculture and viticulture are significant parts of the region's economy, eco-structure and quality of life. NMC has developed a successful and long-standing partnership with Michigan State University's Institute of Agricultural Technology to provide a series of technical specialties within NMC's associate of applied plant science. Students may select areas in applied horticulture, turf management, nursery management, and viticulture. In 2013, NMC and MSU's Institute of Agricultural Technology established a shared position, in collaboration with MSU's Department of Horticulture, as an innovative approach toward collaboration in employer outreach, student recruitment, and internship development. In 2014, this shared approach expanded NMC's capacity to provide specialized programming related to precision agriculture. This program continues today.

Healthcare

The health industry is of critical importance to the citizens of the region and hosts the largest regional employer, Munson Healthcare. NMC's Health Occupation programs are critical suppliers to this industry, especially in the preparation of associate degree nurses and potential pathways to partnering with universities for a BSN program. Most recently, NMC has partnered with Munson Medical Center to offer Associate of Applied Science Degrees in Surgical Technology.

A successful strategy has been the development of the Health Education Institute, a partnership between Munson HealthCare and NMC that supports the coordination of community learning resources,

delivers continuing professional development to staff, and identifies areas for future collaboration in the preparation of health care professionals.

HEI has completed an extensive internal assessment of program impact with the recommendation to continue and expand the relationship as a shared approach to improving efficiency in professional development for staff, career program planning in the nursing program and related allied health areas. This relationship and collaboration continues with semi-annual meetings between the entities.

III. Staffing and Enrollment

The following section responds to questions related to staffing and enrollment trends for NMC.

III-A. Describe current full and part-time student enrollment levels and define how the programs are accessed by the student.

Enrollment by program for the five previous fall semesters is provided in **Appendix B.**

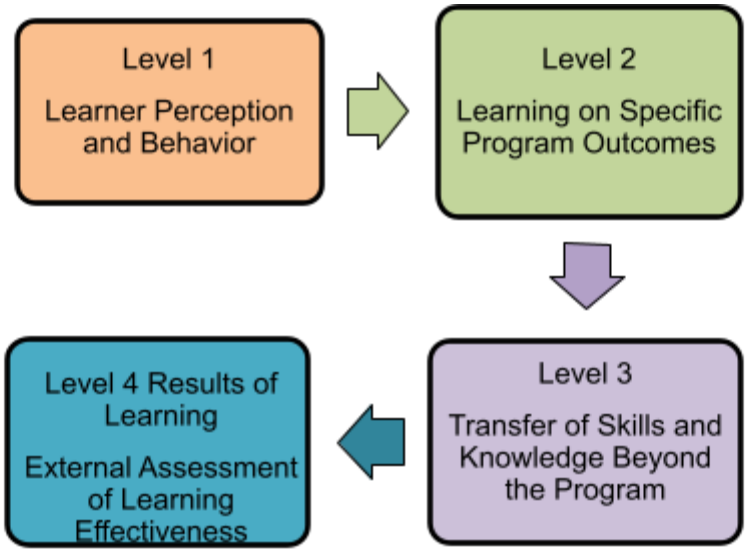
NMC uses multiple measures for student assessment of programs. NMC's annual program review process is the way in which we ensure that our programs and courses are up to date and effective. The premise of the program review is an annual evaluation of quantitative metrics and qualitative reflection on the prior year's activities. From this, goals for the program are set and action plans identified for the coming year. The program review documents and institutional metrics are made available to the college community on the College's internal website.

The metrics tracked in program review are categorized in four phases of evaluation: Learner Perception and Behavior, Learning of Program Outcomes, Skill Transfer, and Results (Figure 1.1).

- For Level One, Learner Perception and Behavior, the college measures learner assessment of the quality of the course instruction and of the course itself, and learner satisfaction with the program as a whole. Enrollment tracking and participation of non-traditional students in the program are measured.
- For Level Two, Learning and Program Outcomes, the program areas track course completion rates, enrollee success rates, graduation rates, student retention or transfer rates, and non-traditional student completion rates.
- For Level Three, Skill Transfer, NMC assesses student success on industry tests, such as licensure, and student placement in employment.
- Finally for Level Four, Results of Learning, program managers query their industry advisory groups for feedback on the curriculum, equipment, graduates, and program administration. NMC has targets or state baselines to measure progress for improvement. When any of these measures fall short of the college targets or state baselines, the program establishes goals and activities designed to improve its performance in these areas. Program areas create action plans to address deficiencies as part of the institutional annual planning and budgeting process.

Figure 1.1. Outcome Framework for Academic Program Review

(see next page)



(Source: **Kirkpatrick, D.L. 1994. Evaluating Training Programs: The Four Levels. San Francisco, CA: Berrett-Koehler.**

III-B. Evaluate enrollment patterns over the last five years

The pandemic had a negative impact on College enrollments across the country. NMC had seen mostly flat enrollment since Fall 2020 and addressed this negative trend by seeking to increase flexible learning options, increase marketing efforts focused on our distinctive programs, and adapt our programs to the needs of our communities. Starting in Fall of 2023, NMC has had four consecutive semesters of increased enrollment.

See **Appendix B** for enrollment by program over the last five years.

III-C. Project enrollment patterns over the next five years (including distance learning initiatives).

The College has experienced four consecutive semesters of enrollment growth but many factors influencing enrollment are still waivering following the pandemic. Census data indicates that the traditional age student population (18-20) will continue to decline through 2030. Community colleges may see an increase in enrollment if we experience a recession, and students return to higher education to learn new skills or trades. A variety of factors, including the state's new Community College Guarantee, may also spur enrollment growth.

We continue to promote the strong academic foundation that Northwestern Michigan College provides students as they complete select bachelor's degrees offered by NMC and their associate degrees for transfer to 4-year colleges and universities, while also highlighting the cost benefit and value students and families realize by attending a community college. Enrollment remains very strong in a number of key programs (i.e. aviation, maritime). In addition, we are promoting two additional Bachelor of Science degrees in Maritime Technology; Marine Technology and Power Systems. As the State focuses on economic growth, new and enhanced job skills and transfer education will remain as key objectives.

We believe one of the largest potential for increases in enrollment growth is through dual enrollment and adult students seeking to enhance their job prospects. NMC is well positioned to offer courses and programs which will capture these audiences. **NMC currently has early college partnerships with Traverse City Area Public Schools and Northwest Educational Services, and The Greenspire School in addition to dual enrollment agreements with a variety of high schools in the area.**

High School Student Enrollment Comparison

Academic Year	High School Students Enrolled	% of Total Enrollment	% change from PY
Fall 2020	426	13.1	+0.6
Fall 2021	412	12.5	-0.6
Fall 2022	387	12.5	0.0
Fall 2023	465	14.7	+2.2
Fall 2024	470	14.4	-.3

To strategically support these efforts NMC has participated in the Michigan College Access Network (MCAN) andLocal College Access Networks (LCAN). We collaborate with these organizations providing presentations and face to face support for students and their parents or guardians in order to assist them as they complete college applications, the Free Application for Federal Student Aid (FAFSA) and college scholarship applications.

NMC also continues to expand existing and new relationships with colleges and universities in other countries such as China, Costa Rica, South Africa and the UK for the purpose of program expansion and student exchange opportunities.

III-D. Provide instructional staff/student and administrative staff/student ratios for major academic programs or colleges

NMC has a standing practice of evaluating all position vacancies for opportunities to distribute work differently, assess the relevance of a service level, and to identify areas in which partnerships may provide options for joint appointments or other creative approaches to management of personnel costs.

As an example, NMC and Michigan State University's Institute of Agricultural Technology (IAT) developed an MOU to share equally in a replacement position serving NMC's Applied Plant Science degree program, which uses IAT's specialty agriculture certificates. This has allowed funding for a full-time position.

Based on fall student, faculty and staff headcounts, ratios were as follows:

Semester	Headcount	Full-Time Faculty & Adjunct Headcount	Ratio of Student to Faculty
Fall 2020	3,278	226	16:1
Fall 2021	3,285	221	14:1
Fall 2022	3,100	201	15:1
Fall 2023	3,148	170	18:1

Semester	Headcount	Admin. & Professional Headcount	Ratio of Student to Staff
Fall 2020	3276	118	32:1
Fall 2021	3,285	108	28:1
Fall 2022	3,100	106	29:1
Fall 2023	3,148	115	27:1

Based on the structure at NMC some administrative positions include teaching as part of their responsibilities. **Appendix C** provides faculty and staff headcounts for the previous five years.

III-E. Projected staffing needs based on five-year enrollment estimates and future programming changes.

NMC has approached a number of staffing questions through the development of a multi-year project-based approach toward talent recruitment, development, retention, and succession. The project has produced new employee orientation programs, the NMC Leadership Institute, and multiple professional development modules ranging from compliance training, supervisor training, wellness initiatives, and self-directed learning opportunities related to workplace improvement.

The College is committed to aligning its workforce to support its strategic direction and establish a values-based framework to provide sustainable and competitive compensation. Further, the College continues to offer and maintain flexible working options allowing employees to work from home and design their schedule within parameters of operational needs. Due to declining enrollments, during fiscal year 2018 we offered an early separation incentive to faculty and staff at the top of their pay scale. This gave us an opportunity to restructure the institution. The College was able to reduce 12 positions with this incentive program to help control labor costs.

III-F. Identify current average class size and projected class size needs

NMC manages its section sizes based on an efficiency model with a college goal of 90% efficiency. **Appendix D** contains course efficiency data by academic division for the previous six academic years. Class sizes are driven primarily by pedagogical factors related to the subject matter being taught.

IV. Facilities Assessment

NMC completed its most recent campus master plan in 2024. The College contracts with Sodexo for facilities management services. Sodexo prepares a comprehensive facilities assessment every 3 years to help the College identify and prioritize deferred maintenance needs. The most recent assessment can be found at **Appendix E**.

IV-A. Summary description of each facility.

A summary of buildings, their ages, and square footage is included as **Appendix F.**

IV-B. Building and classroom utilization rates.

Virtually all College events and classes are scheduled through the College's R25 scheduling system. **Appendix G** is produced from R25 and provides information on the utilization, functionality and allocation of organizational facilities.

IV-C. Mandated facility standards for specific programs, where applicable.

NMC's facilities fully comply with all applicable laws and safety standards for specific programs. The College continues to monitor all applicable Federal, State, and local laws impacting our property.

IV-D. Functionality of existing structures and space allocation to program areas served.

Existing buildings and facilities are often repurposed to meet the evolving needs of the College. One of the biggest opportunities for the College to improve functionality across the campus is the implementation of a "one-stop shop" hub for student services in our Osterlin Building. The consolidation of our student services into one building would improve operational efficiency of the College, but more importantly would improve the student experience and related retention efforts.

IV-E. Replacement value of existing facilities (insured value of structure to the extent available).

The replacement value of our buildings is assessed at $294,034,200 as of November 1, 2023. The Fall 2024 appraisal was not available at the time of this submission. We've included the Fall 2023 appraisal report in **Appendix H**.

IV-F. Utility system condition (i.e. heating, ventilation, and air conditioning (HVAC), water and sewage, electrical, etc.).

Each item identified in the Facilities Condition Assessment (**Appendix E**) is listed by category (i.e. electrical, mechanical, plumbing, etc.) Of the College's estimated $22.1 million in deferred maintenance over the next five years, 22% is categorized as HVAC, 18% as Electrical, and 31% as Interior Construction and Finishes. Utility needs are adequately considered as part of the annual budgeting process. The following table summarizes the College's utility providers and needs:

Campus Utilities

Utility	Notes
Electric	Traverse City Light and Power (Traverse City Campuses). Sufficient city capacity appears to be available to meet projected college needs.
Water	Traverse City and Garfield Township provide water.
Sewage	City of Traverse City and Garfield Township.
Storm Sewers	Limited access to Traverse City storm sewers is available. The Front Street campus is equipped with numerous dry wells into which storm water drains. Main campus includes a large stormwater retention system.
Natural Gas	Campus heating systems are natural gas. Adequate capacities currently exist.

IV-G. Facility infrastructure condition (i.e. roads, bridges, parking structures, lots, etc.)

The majority of lots, roads and walks on and off Main Campus are in good shape. An annual schedule for the repair and replacement of sidewalks and the repair/seal/replacement of parking lots and campus roads has been allocated and incorporated in the College's capital and operating budgets as applicable.

Appendix I shows a map of the Front Street (Main) campus.

IV-H. Adequacy of existing utilities and infrastructure systems to current and 4-year projected programmatic needs.

Based on our current and five year projections NMC utilities and infrastructure systems are sufficient. As a means to reduce utility costs NMC continues to investigate ways to provide alternative energy solutions to our campus. The college board authorized a geothermal energy system for the West Hall Innovation Center project (recently renamed the Timothy J. Nelson Innovation Center). The intention is to use the data from this building as a starting point for an overall campus alternative energy project.

Further studies are underway to assess the cost and viability of implementing a larger geothermal system on the main campus to power six central buildings.

IV-I. Does the institution have an enterprise-wide energy plan? What are its goals? Have energy audits been completed on all facilities and, if not, what is the plan/timetable for completing such audits?

See section above regarding our exploration of sustainable energy systems on campus. We engaged an engineering firm to complete an energy study in October 2021 covering six key buildings on campus: Health & Science Building, Biederman Building, Tanis Building, Osterlin Building, Scholars Hall, the Powerhouse Building. The key recommendation from this study was to replace our current aging boiler system with a distributed geothermal energy system including HVAC upgrades on the six buildings listed.

In 2021, the College finished implementing a campus-wide LED lighting upgrade as recommended in our 2015 and 2010 energy audits. The estimated annual savings from this campus wide project is over $50,000 per year. Other projects considered were related to water conservation, low flow aerators, and variable frequency drivers in some of our buildings. The College also takes full advantage of an energy rebate program through our local provider, Traverse City Light and Power. This program has enabled us to complete several lighting upgrades on campus and explore the use of solar energy.

All projects are evaluated for energy savings. As roofs are replaced, additional insulation measures are included in those projects. Other areas of savings include insulated glass overhead doors in our power house, replacement of old boilers with more efficient ones, and new cooling towers to improve the energy efficiency of our HVAC systems.

IV-J. Land owned by the institution, including a determination of whether capacity exists for future development, additional acquisitions are needed to meet future demands, or surplus land can be conveyed for a different purpose.

Under current assumptions for future growth, there is existing capacity for future development on land owned by the college. The College will explore our greatest needs and consider development opportunities as described in our board approved campus master plan.

IV-K. What portions of existing buildings, if any, are currently obligated to the State Building Authority and when these State Building Authority leases are set to expire.

The table below outlines the statistics on the three NMC buildings that are obligated to the State Building Authority.

Building Description	Primary Use	Date of Retirement
Health & Science Building (Integrated Science & Tech Learning Center)	Classrooms and labs	2042
Great Lakes Campus (West Bay)	Specialized classrooms and conferencing facility	2043
Oleson Center	Childcare	2042
Timothy J. Nelson Innovation Center (West Hall Innovation Center)	Classrooms, study spaces, cafeteria, flexible meeting spaces	2055

V. Implementation Plan

V-A. Prioritize major capital projects requested from the State, including a brief description and estimated cost, in the format provided. (Adjust previously developed or prior years' figures utilizing industry standard CPI indexes where appropriate).

Northwestern Michigan College continues evaluating its academic programming and related facilities needs, including how current buildings can be improved and leveraged to increase quality, efficiency, and effectiveness of course delivery.

The College's Administration identified our top capital projects based on the prioritization criteria listed in the table below. We also considered the following questions:

1. Is the project aligned with our Strategic Plan?
2. Is there data to demonstrate an immediate or future need?
3. Is there a business model that demonstrates financial sustainability?

Project	Supports Strategic Plan	Meets Current Capacity Need	Growth Opportunity	Safety Issue	Cosmetic Appeal	Learner Expectation	Time Sensitive
Osterlin Building	X	X	X	X	X	X	X
Aviation Hangar	X	X	X	X	X	X	X
Energy Infrastructure		X		X	X	X	X
Student Housing	X	X	X		X	X	X
Founder's Hall		X	X		X	X	
Physical Ed		X			X	X	
Outdoor Classroom		X	X		X	X	

Project	Total Cost
Osterlin Building (Student Services Hub)	$ 8.0 million
Aviation Hangar (hangar expansion and modernization)	$ 7.5 million
Energy Infrastructure Upgrade (geothermal for 6 buildings)	$ 16.0 million
Student Housing (new facility)	$ 10.0 million
Founder's Hall (renovation)	$ 5.0 million
Physical Education / Recreational Building	$ 12.0 million
Outdoor Classroom (and event space)	$ 0.5 million

We continue assessing the capital priorities of the College and related financing options. In addition to these facility building projects, we see an escalated need for investment in technology to support evolving learning environments. During recent years, the college invested over a million dollars to upgrade its firewall and expand wireless infrastructure to improve web accessibility, reliability, and internet safety across campus. The College also installed secure remote key access for all buildings. This investment allows NMC security to lock down buildings remotely if required during an emergency. The

College continues to invest in security cameras and qualified security professionals to provide the safest possible environment on our campuses

As noted in the table above, NMC continues to identify the renovation of the Osterlin Building as our top priority capital project. This 60-year old building would be renovated and remodeled to provide our students a one-stop shop / student service hub. The updated space would provide a holistic approach to student services. The estimated cost of this project is $7.0 million.

V-B. If applicable, provide an estimate relative to the institution's current deferred maintenance backlog. Define the impact of addressing deferred maintenance and structural repairs, including programmatic impact, immediately versus over the next five years.

See Facilities Condition Assessment at **Appendix E**. Northwestern Michigan College recognizes the importance of addressing deferred maintenance in its operating budget. Beginning in 2009 the College began providing funding through the General Fund to address deferred maintenance backlog.

The facilities assessment identified approximately $22.1 million in deferred maintenance required over the next five years. Funding for certain identified items has been included in the College's plant fund budget. Addressing deferred maintenance is critical for the college to carry out its mission of providing a state of the art quality program to its students. However, given limited financial resources the College must prioritize the most critical projects within the scope of its budget.

V-C. Include the status of on-going projects financed with State Building Authority resources and explain how completion coincides with the overall Five-Year Capital Outlay Plan.

As of October 2023, there are no current or on-going projects at NMC that are financed with State Building Authority resources. Northwestern Michigan College hosted a groundbreaking ceremony on September 24, 2018 for the West Hall Innovation Center (#332/16282), officially renamed the Timothy J. Nelson Innovation Center. This building was completed in July 2021 with support from SBA.

V-D. Identify, to the extent possible, a rate of return on planned expenditures. This could be expressed as operational savings that a planned capital expenditure would yield in future years.

The College evaluates each major building project to determine a rate of return. This is accomplished by a reduction in operating costs such as utility savings along with any staffing reductions that could be attributed to the redesign of a facility.

V–E. Where applicable, consider alternatives to new infrastructure such as distance learning.

The College continues to assess the future of learning and future of work in its capital planning process. Although distance and flexible learning options will continue to drive changes in higher education, there is still a role for innovative and functional learning facilities. Our proposed building projects enhance current learning by engaging students and faculty in an interactive learning environment.

V-F. Identify maintenance schedule for major maintenance items in excess of $1 million for fiscal year 2024-2028.

Currently, there are no single identified maintenance items over $1 million.

V-G. Identify the amount of non-routine maintenance the institution has budgeted for in its current fiscal year and relevant sources of financing.

Northwestern Michigan College completes a comprehensive Facility Condition Assessment every three years to determine the key maintenance needs of every building on campus. Every budgeting year, we review and compile this data to prioritize our top facility needs. The College's twenty-six (26) active buildings represent approximately 850,000 square feet of space. The College's General Fund provides over $1.2 million in annual funding for critical deferred maintenance.

See **Appendix E** for our facilities condition assessment. NMC strives to maintain an overall facilities rating of "Good". The cumulative FCI percentage for our campus as of November 2021 is 6%, which falls into the category of "Good" per this report.

Appendix A
NMC Economic Impact

NMC

Main Report

FEBRUARY 2024

The Economic Value of Northwestern Michigan College

Lightcast

Contents

Preface

Lightcast is a leading provider of economic impact studies and labor market data to educational institutions, workforce planners, and regional developers in the U.S. and internationally. Since 2000, Lightcast has completed over 3,000 economic impact studies for educational institutions in three countries. Along the way, we have worked to continuously update and improve our methodologies to ensure that they conform to best practices.

The present study reflects the latest version of our model, representing the most up-to-date theory for conducting human capital economic impact analyses. Some changes are due to our efforts to conform to best practices for economic impact analyses. For example, the economic impact guidelines set by the Association for Public Land-Grant Universities discourage the inclusion of depreciation and interest expenses in operations spending impacts. Previous iterations of our model have used this measure as a proxy for capital maintenance. However, in an effort to provide more conservative and defensible results, we now exclude those expenditures from the operations spending impact.

The model is consistently being updated as more data becomes available. For example, in prior studies the alumni impact only included the alumni served over the past 30 years. Historical headcount data beyond 30 years oftentimes did not exist and estimates were unreliable. However, historical headcount data reliability has increased over the years, making the historical headcount estimates by Lightcast more accurate. Therefore, the impact from alumni has been expanded to include all alumni active in the regional workforce who have not reached the average retirement age of 67.

This model, as with previous versions, has various external data inputs which reflect the most current economic activity and data. These data include (but are not limited to): the taxpayer discount rate; the student discount rate; the consumer savings rate; the consumer price index; national health expenditures; state and local industry earnings as a percent of total industry earnings; income tax brackets and sales tax by state; and unemployment, migration, and life tables. All data sets are maintained quarterly, although most updates occur only once a year.

These and other changes mark a considerable upgrade to the Lightcast economic impact model. Our hope is that these improvements will provide a better product for our clients – reports that are more transparent and streamlined, methodology that is more comprehensive and robust, and findings that are more relevant and meaningful to today's audiences.

While this report is useful in demonstrating the current value of Northwestern Michigan College (NMC), it is not intended for comparison with NMC's previous study conducted by Lightcast in 2017. Due to the extent of external data updates and improvements in Lightcast's model since 2017, differences between results from the 2017 study and the present study do not necessarily indicate changes in the value of the college. For example, the source of migration data has been updated to the Internal Revenue Service, which provides more granular and reliable data on migration, making the regional and state outmigration rates used in the study reflective of actual historical migration patterns.

Lightcast encourages our readers to approach us directly with any questions or comments they may have about the study so that we can continue to improve our model and keep the public dialogue open about the positive impacts of education.

A note on comparing studies

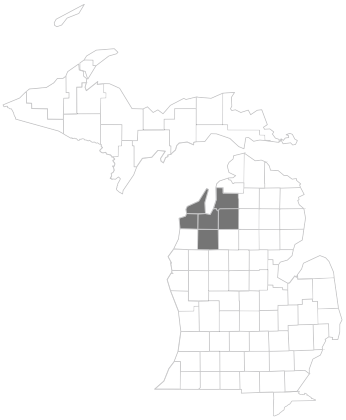
It is important to note that the changes outlined above represent important improvements to our methodology, ultimately providing more accurate and robust results. However, these changes make it difficult to directly compare past studies to the current study, with the effectiveness of the comparison decreasing as the age of the previous study increases.

Additionally, in general Lightcast discourages comparisons between individual institutions and between educational systems since many factors, such as regional economic and political conditions, institutional differences, and student demographics are outside of the institution's control. In addition, every institution is unique, meaning the results and types of impact or investment measures are tailored to the specific institution or educational system.

Executive summary

This report assesses the impact of Northwestern Michigan College (NMC) on the regional economy and the benefits generated by the college for students, taxpayers, and society. The results of this study show that NMC creates a positive net impact on the regional economy and generates a positive return on investment for students, taxpayers, and society.

Economic impact analysis



The NMC Service Area

During the analysis year, NMC spent $30.4 million on payroll and benefits for 672 full-time and part-time employees and spent another $23.8 million on goods and services to carry out its day-to-day and construction operations. This initial round of spending creates more spending across other businesses throughout the regional economy, resulting in the commonly referred to multiplier effects. This analysis estimates the net economic impact of NMC that directly accounts for the fact that state and local dollars spent on NMC could have been spent elsewhere in the region if not directed toward NMC and would have created impacts regardless. We account for this by estimating the impacts that would have been created from the alternative spending and subtracting the alternative impacts from the spending impacts of NMC.

> The additional income of **$204.5 million** created by NMC is equal to approximately **2.0%** of the total gross regional product of the NMC Service Area.

This analysis shows that in fiscal year (FY) 2021-22, operations and student spending of NMC, together with the enhanced productivity of its alumni, generated **$204.5 million** in added income for the NMC Service Area[1] economy. The additional income of **$204.5 million** created by NMC is equal to approximately **2.0%** of the total gross regional product (GRP) of the NMC Service Area. For perspective, this impact from the college is nearly as large as the entire Transportation & Warehousing industry in the region. The impact of **$204.5 million** is equivalent to supporting **3,106 jobs**. For further perspective, this

1 For the purposes of this analysis, the NMC Service Area is comprised of Antrim, Benzie, Grand Traverse, Kalkaska, Leelanau, and Wexford Counties.

means that **one out of every 42 jobs** in the NMC Service Area is supported by the activities of NMC and its students. These economic impacts break down as follows:

Operations spending impact

Payroll and benefits to support NMC's day-to-day operations amounted to $30.4 million. The college's non-pay expenditures amounted to $23.8 million, $12.1 million of which was spent directly in the NMC Service Area. The net impact of operations spending by the college in the NMC Service Area during the analysis year was approximately **$37.4 million** in added income, which is equivalent to supporting **749 jobs**.

Student spending impact

Around 14% of students attending NMC originated from outside the region. Some of these students relocated to the NMC Service Area to attend the college. In addition, some students are residents of the NMC Service Area who would have left the region if not for the existence of NMC. The money that these students, referred to as retained students, spent toward living expenses in the NMC Service Area is attributable to NMC.

The expenditures of relocated and retained students in the region during the analysis year added approximately **$3.2 million** in income for the NMC Service Area economy, which is equivalent to supporting **51 jobs**.

Alumni impact

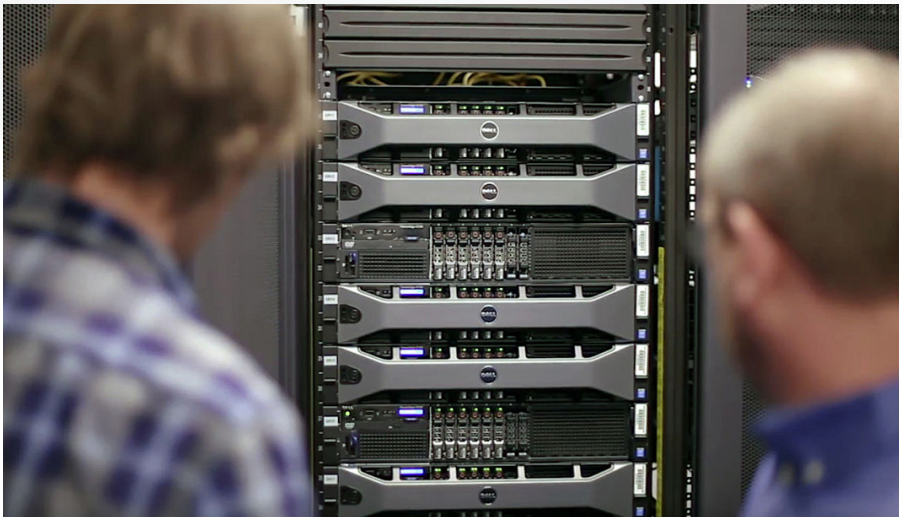
Over the years, students gained new skills, making them more productive workers, by studying at NMC. Today, thousands of these former students are employed in the NMC Service Area.

The accumulated impact of former students currently employed in the NMC Service Area workforce amounted to **$163.9 million** in added income for the NMC Service Area economy, which is equivalent to supporting **2,305 jobs**.

Important note

When reviewing the impacts estimated in this study, it is important to note that the study reports impacts in the form of added income rather than sales. Sales includes all of the intermediary costs associated with producing goods and services, as well as money that leaks out of the region as it is spent at out-of-region businesses. Income, on the other hand, is a net measure that excludes these intermediary costs and leakages and is synonymous with gross regional product (GRP) and value added. For this reason, it is a more meaningful measure of new economic activity than sales.

Investment analysis



Investment analysis is the practice of comparing the costs and benefits of an investment to determine whether or not it is profitable. This study evaluates NMC as an investment from the perspectives of students, taxpayers, and society.

Student perspective

Students invest their own money and time in their education to pay for tuition, books, and supplies. Many take out student loans to attend the college, which they will pay back over time. While some students were employed while attending the college, students overall forewent earnings that they would have generated had they been in full employment instead of learning. Summing these direct outlays, opportunity costs, and future student loan costs yields a total of **$18.4 million** in present value student costs.

In return, students will receive a present value of **$95.0 million** in increased earnings over their working lives. This translates to a return of **$5.20** in higher future earnings for every dollar that students invest in their education at NMC. The corresponding annual rate of return is **20.3%**.

Taxpayer perspective

Taxpayers provided **$25.8 million** of state and local funding to NMC in FY 2021-22. In return, taxpayers will receive an estimated present value of **$32.8 million** in added tax revenue stemming from the students' higher lifetime earnings

and the increased output of businesses. Savings to the public sector add another estimated **$3.1 million** in benefits due to a reduced demand for government-funded social services in Michigan. Total taxpayer benefits amount to **$35.9 million**, the present value sum of the added tax revenue and public sector savings. For every tax dollar spent educating students attending NMC, taxpayers will receive an average of **$1.40** in return over the course of the students' working lives. In other words, taxpayers receive an annual rate of return of **2.1%**.

For every tax dollar spent educating students attending NMC, taxpayers will receive an average of **$1.40** in return over the course of the students' working lives.

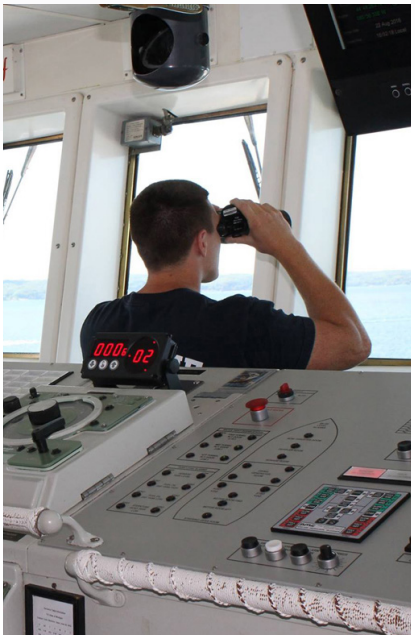
Social perspective

People in Michigan invested **$55.9 million** in NMC in FY 2021-22. This includes the college's expenditures, student expenses, and student opportunity costs. In return, the state of Michigan will receive an estimated present value of **$402.1 million** in added state revenue over the course of the students' working lives. Michigan will also benefit from an estimated **$9.8 million** in present value social savings related to reduced crime, lower welfare and unemployment assistance, and increased health and well-being across the state. For every dollar society invests in NMC, an average of **$7.40** in benefits will accrue to Michigan over the course of the students' careers.

Acknowledgments

Lightcast gratefully acknowledges the excellent support of the staff at Northwestern Michigan College in making this study possible. Special thanks go to Dr. Nick Nissley, President, who approved the study, and to Shelly Grant, Business Intelligence Analyst; Troy Kierczynski, Vice President of Finance & Administration; Denny Nguyen, Human Resource Specialist; Linda Berlin, Director of Financial Aid; and Joy Goodchild, Executive Director of Research, Planning & Effectiveness, who collected much of the data and information requested. Any errors in the report are the responsibility of Lightcast and not any of the above-mentioned individuals.

Introduction



Northwestern Michigan College (NMC), established in 1951, has today grown to serve 4,316 credit and 2,298 non-credit students. The college is led by Dr. Nick Nissley, President. The college's service region, for the purpose of this report, is referred to as the NMC Service Area and consists of Antrim, Benzie, Grand Traverse, Kalkaska, Leelanau, and Wexford Counties.

While this study only considers the economic benefits generated by NMC, it is worth noting the region receives a variety of benefits from the college, including social and cultural benefits that are difficult to quantify. The college naturally helps students achieve their individual potential and develop the knowledge, skills, and abilities they need to have fulfilling and prosperous careers. However, NMC impacts the NMC Service Area beyond influencing the lives of students. The college's program offerings supply employers with workers to make their businesses more productive. The college, its day-to-day and construction operations, and the expenditures of its students support the regional economy through the output and employment generated by regional vendors. The benefits created by the college extend as far as the state treasury in terms of the increased tax receipts and decreased public sector costs generated by students across the state.

> NMC impacts the NMC Service Area beyond influencing the lives of students.

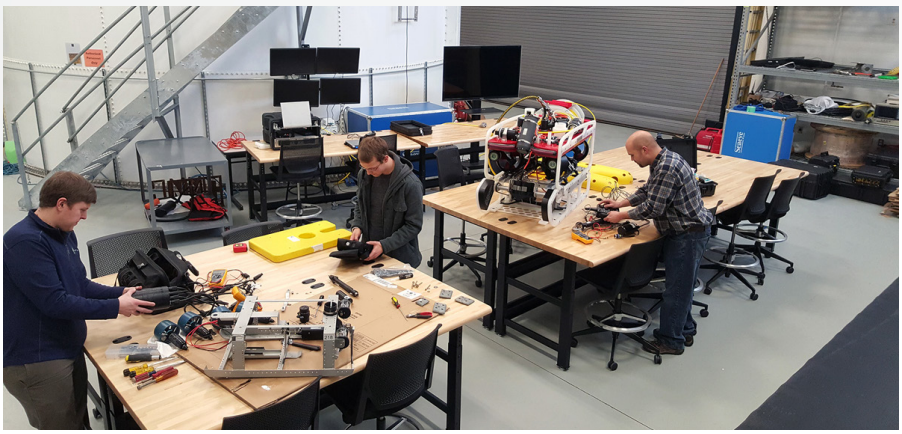
This report assesses the impact of NMC as a whole on the regional economy and the benefits generated by the college for students, taxpayers, and society. The approach is twofold. We begin with an economic impact analysis of the college on the NMC Service Area economy. To derive results, we rely on a specialized Multi-Regional Social Accounting Matrix (MR-SAM) model to calculate the added income created in the NMC Service Area economy as a result of increased consumer spending and the added knowledge, skills, and abilities of students. Results of the economic impact analysis are broken out according to the following impacts: 1) impact of the college's operations spending, 2) impact of student spending, and 3) impact of alumni who are still employed in the NMC Service Area workforce.

The second component of the study measures the benefits generated by NMC for the following stakeholder groups: students, taxpayers, and society. For students, we perform an investment analysis to determine how the money spent by students on their education performs as an investment over time. The students' investment in this case consists of their out-of-pocket expenses, the cost of interest incurred on student loans, and the opportunity cost of attending the college as opposed to working. In return for these investments, students receive a lifetime of higher earnings. For taxpayers, the study measures the benefits to state taxpayers in the form of increased tax revenues and public sector savings stemming from a reduced demand for social services. Finally, for society, the study assesses how the students' higher earnings and improved quality of life create benefits throughout Michigan as a whole.

The study uses a wide array of data that are based on several sources, including the FY 2021-22 academic and financial reports from NMC; industry and employment data from the Bureau of Labor Statistics and Census Bureau; outputs of Lightcast's impact model and MR-SAM model; and a variety of published materials relating education to social behavior.

Chapter 1:

Profile of Northwestern Michigan College and the economy



NORTHWESTERN MICHIGAN COLLEGE (NMC) is a public college that has served the residents of Michigan's Grand Traverse region for over 70 years. From humble origins operating out of borrow facilities at an airport terminal, NMC has grown to encompass multiple campuses located throughout the Grand Traverse region. In FY 2021-22 NMC served 4,316 credit students and 2,298 non-credit students.

Prospective students can choose from over 60 programs offered at the main campus in Traverse City, these programs range from certificates tailored to specific jobs to several bachelor's degrees. NMC is also host to the NMC university center which offers select bachelor, graduate, doctorate, certificate, and endorsement programs. By attending the University center, students can fulfill their educational goals without leaving northwestern Michigan.

Along with its credit offerings, NMC also offers a diverse array of lifelong and professional learning opportunities. These classes allow students to further develop the skills they need to be successful in their careers or learn entirely new skills. Unique to NMC is the Great Lakes Maritime Academy which provides the college's students with the skills they need to work in the commercial shipping industry. This includes hands on training on the ship *State of Michigan*.

Prospective students can choose from **over 60 programs** offered at the main campus in Traverse City.

NMC also provides students and community residents numerous facilities and events. For example, the Dennos Museum, located on NMC's Traverse City Campus, houses a notable collection of Inuit art of the Canadian Arctic, as well as a significant collection of outdoor sculptures from noted artists.

Finally, NMC is a vital asset to regional employers. The college adds highly trained and knowledgeable human capital to the regional workforce through building strong partnerships with businesses and organizations, thereby continuously contributing to community well-being and fostering regional economic prosperity.

NMC employee and finance data

The study uses two general types of information: 1) data collected from the college and 2) regional economic data obtained from various public sources and Lightcast's proprietary data modeling tools.[2] This chapter presents the basic underlying information from NMC used in this analysis and provides an overview of the NMC Service Area economy.

Employee data

Data provided by NMC include information on faculty and staff by place of work and by place of residence. These data appear in Table 1.1. As shown, NMC employed 286 full-time and 386 part-time faculty and staff in FY 2021-22 (including student workers). Of these, all worked in the region and 93% lived in the region. These data are used to isolate the portion of the employees' payroll and household expenses that remains in the regional economy.

Table 1.1: Employee data, FY 2021-22

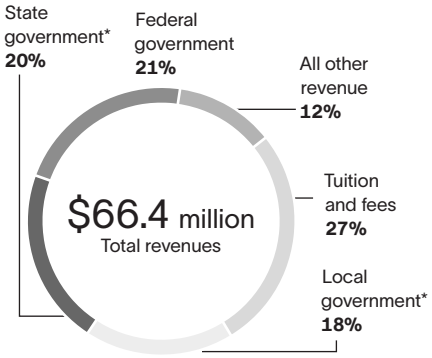
Full-time faculty and staff	286
Part-time faculty and staff	386
Total faculty and staff	**672**
% of employees who work in the region	100%
% of employees who live in the region	93%

Source: Data provided by NMC.

Revenues

Figure 1.1 shows the college's annual revenues by funding source – a total of $66.4 million in FY 2021-22. As indicated, tuition and fees comprised 27% of total revenue, and revenues from local, state, and federal government sources comprised another 60%. All other revenue (i.e., auxiliary revenue, sales and services, interest, and donations) comprised the remaining 13%. These data are critical in identifying the annual costs of educating the student body from the perspectives of students, taxpayers, and society.

Figure 1.1: NMC revenues by source, FY 2021-22

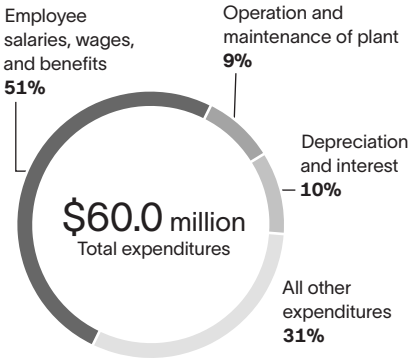


* Revenue from state and local government includes capital appropriations.
Source: Data provided by NMC.
Percentages do not sum to 100% due to rounding.

Expenditures

Figure 1.2 displays NMC's expense data. The combined payroll at NMC, including student salaries and wages, amounted to $30.4 million. This was equal to 51% of the college's total expenses for FY 2021-22. Other expenditures, including capital construction, operation and maintenance of plant, depreciation and interest, and purchases of supplies and services, made up $29.6 million. When we calculate the impact of these expenditures in Chapter 2, we exclude expenses for depreciation and interest, as they represent a devaluing of the college's assets rather than an outflow of expenditures.

Figure 1.2: NMC expenses by function, FY 2021-22



Source: Data provided by NMC.

Students

NMC served 4,316 students taking courses for credit and 2,298 non-credit students in FY 2021-22. These numbers represent unduplicated student headcounts. The breakdown of the student body by gender was 58% female, 42% male. The breakdown

2 See Appendix 5 for a detailed description of the data sources used in the Lightcast modeling tools.

by ethnicity was 70% white, 9% students of color, and 21% unknown. The students' overall average age was 26 years old.[3] An estimated 73% of students remain in the NMC Service Area after finishing their time at NMC, another 14% settle outside the region but in the state, and the remaining 13% settle outside the state.[4]

Table 1.2 summarizes the breakdown of the student population and their corresponding awards and credits by education level. In FY 2021-22, NMC served 35 bachelor's degree graduates, 530 associate degree graduates, and 81 certificate graduates. Another 3,180 students enrolled in courses for credit but did not complete a degree during the reporting year. The college offered dual credit courses to high schools, serving a total of 490 students over the course of the year. The college also served 2,082 personal enrichment students enrolled in non-credit courses. Non-degree seeking students enrolled in workforce or professional development programs accounted for 216 students.

We use credit hour equivalents (CHEs) to track the educational workload of the students. One CHE is equal to 15 contact hours of classroom instruction per semester. In the analysis, we exclude the CHE production of personal enrichment students under the assumption that they do not attain knowledge, skills, and abilities that will increase their earnings. The average number of CHEs per student (excluding personal enrichment students) was 11.6.

Table 1.2: Breakdown of student headcount and CHE production by education level, FY 2021-22

Category	Headcount	Total CHEs	Average CHEs
Bachelor's degree graduates	35	798	22.8
Associate degree graduates	530	7,809	14.7
Certificate graduates	81	1,153	14.2
Continuing students	3,180	37,876	11.9
Dual credit students	490	4,605	9.4
Personal enrichment students	2,082	1,981	1.0
Workforce/professional development students	216	133	0.6
Total, all students	**6,614**	**54,355**	**8.2**
Total, less personal enrichment students	**4,532**	**52,374**	**11.6**

Source: Data provided by NMC.

3 Unduplicated headcount, gender, ethnicity, and age data provided by NMC.

4 Settlement data provided by NMC.

The NMC Service Area economy

NMC serves a region referred to as the NMC Service Area in Michigan.[5] Since the college was first established, it has been serving the NMC Service Area by enhancing the workforce, providing local residents with easy access to higher education opportunities, and preparing students for highly-skilled, technical professions. Table 1.3 summarizes the breakdown of the regional economy by major industrial sector ordered by total income, with details on labor and non-labor income. Labor income refers to wages, salaries, and proprietors' income. Non-labor income refers to profits,

Table 1.3: Income by major industry sector in the NMC Service Area, 2022*

Industry sector	Labor income (millions)	Non-labor income (millions)	Total income (millions)**	% of total income	Sales (millions)
Health Care & Social Assistance	$1,152	$149	$1,301	13%	$2,111
Manufacturing	$745	$482	$1,227	12%	$3,242
Retail Trade	$587	$395	$983	10%	$1,654
Finance & Insurance	$567	$313	$880	9%	$1,573
Government, Non-Education	$567	$114	$681	7%	$3,016
Construction	$556	$108	$664	7%	$1,352
Accommodation & Food Services	$373	$260	$633	6%	$1,140
Wholesale Trade	$204	$326	$530	5%	$809
Real Estate & Rental & Leasing	$349	$136	$485	5%	$1,147
Professional & Technical Services	$375	$94	$470	5%	$720
Information	$130	$188	$318	3%	$556
Government, Education	$309	<$1	$309	3%	$356
Mining, Quarrying, & Oil and Gas Extraction	$85	$222	$308	3%	$573
Administrative & Waste Services	$228	$48	$275	3%	$506
Utilities	$74	$196	$270	3%	$452
Other Services (except Public Administration)	$237	$29	$266	3%	$431
Transportation & Warehousing	$172	$35	$207	2%	$445
Agriculture, Forestry, Fishing & Hunting	$109	$53	$162	2%	$352
Arts, Entertainment, & Recreation	$80	$25	$105	1%	$164
Educational Services	$88	$3	$91	1%	$116
Management of Companies & Enterprises	$32	$2	$34	<1%	$56
Total	**$7,020**	**$3,180**	**$10,199**	**100%**	**$20,769**

* Data reflect the most recent year for which data are available. Lightcast data are updated quarterly.

** Numbers may not sum to totals due to rounding.

Source: Lightcast industry data.

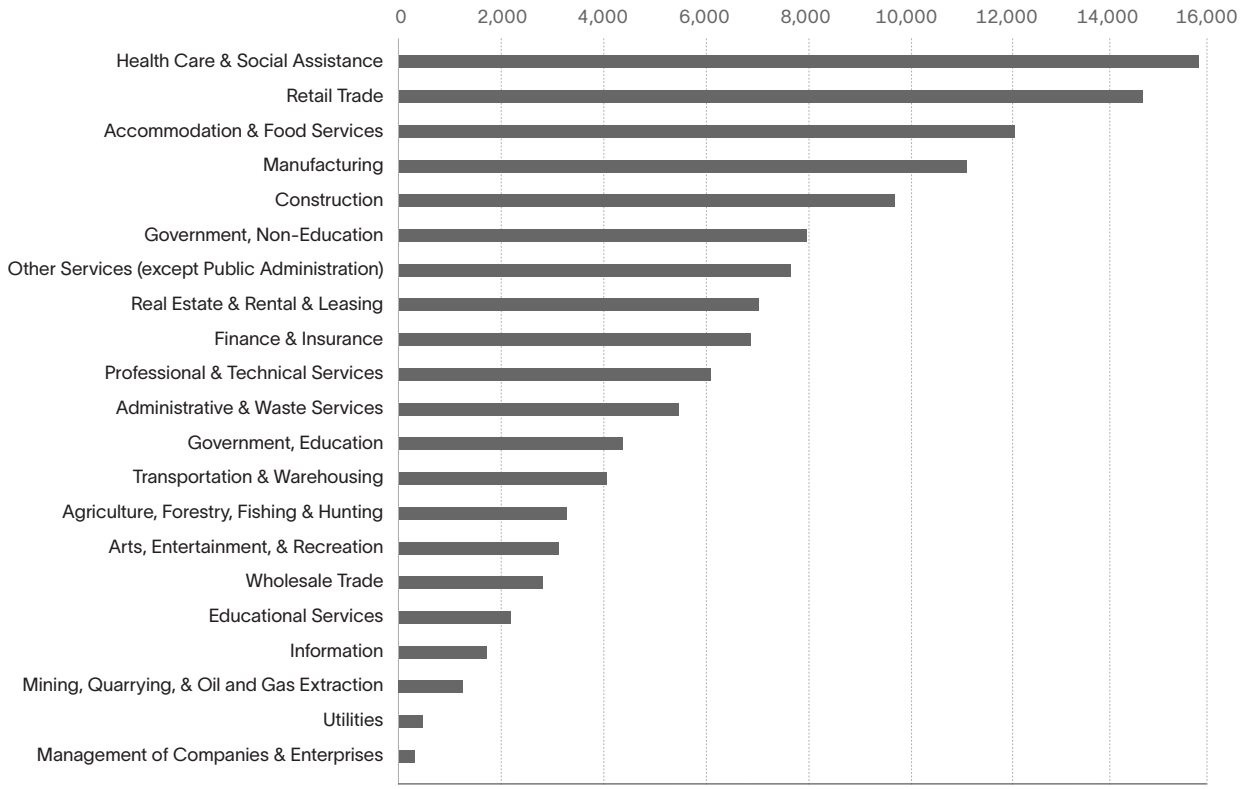
5 The following counties comprise the NMC Service Area: Antrim, Benzie, Grand Traverse, Kalkaska, Leelanau, and Wexford.

rents, and other forms of investment income. Together, labor and non-labor income comprise the region's total income, which can also be considered the region's gross regional product (GRP).

As shown in Table 1.3, the total income, or GRP, of the NMC Service Area is approximately $10.2 billion, equal to the sum of labor income ($7.0 billion) and non-labor income ($3.2 billion). In Chapter 2, we use the total added income as the measure of the relative impacts of the college on the regional economy.

Figure 1.3 provides the breakdown of jobs by industry in the NMC Service Area. The Health Care & Social Assistance sector is the largest employer, supporting 15,631 jobs or 12.1% of total employment in the region. The second largest employer is the Retail Trade sector, supporting 14,543 jobs or 11.3% of the region's total employment. Altogether, the region supports 128,919 jobs.[6]

Figure 1.3: Jobs by major industry sector in the NMC Service Area, 2022*



* Data reflect the most recent year for which data are available. Lightcast data are updated quarterly.

Source: Lightcast employment data.

6 Job numbers reflect Lightcast's complete employment data, which includes the following four job classes: 1) employees who are counted in the Bureau of Labor Statistics' Quarterly Census of Employment and Wages (QCEW), 2) employees who are not covered by the federal or state unemployment insurance (UI) system and are thus excluded from QCEW, 3) self-employed workers, and 4) extended proprietors.

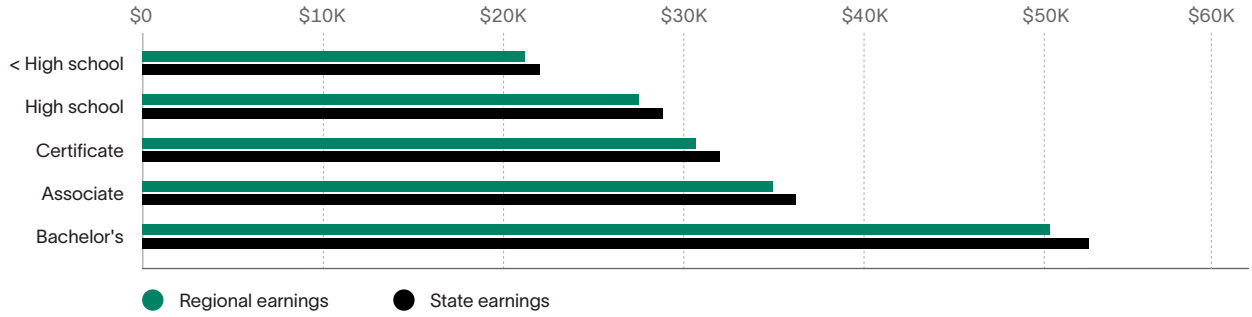
Table 1.4 and Figure 1.4 present the mean earnings by education level in the NMC Service Area and the state of Michigan at the midpoint of the average-aged worker's career. These numbers are derived from Lightcast complete employment data on average earnings per worker in the region and the state.[7] The numbers are then weighted by the college's demographic profile, and state earnings are weighted by students' settlement patterns. As shown, students have the potential to earn more as they achieve higher levels of education compared to maintaining a high school diploma. Students who earn an associate degree from NMC can expect approximate wages of $35,500 per year within the NMC Service Area, approximately $8,100 more than someone with a high school diploma.

Table 1.4: Average earnings by education level at a NMC student's career midpoint

Education level	Regional earnings	Difference from next lowest degree	State earnings	Difference from next lowest degree
Less than high school	$20,200	n/a	$21,000	n/a
High school or equivalent	$27,400	$7,200	$28,500	$7,500
Certificate	$30,800	$3,400	$32,000	$3,500
Associate degree	$35,500	$4,700	$36,900	$4,900
Bachelor's degree	$50,500	$15,000	$52,600	$15,700

Source: Lightcast employment data.

Figure 1.4: Average earnings by education level at a NMC student's career midpoint



Source: Lightcast employment data.

7 Wage rates in the Lightcast MR-SAM model combine state and federal sources to provide earnings that reflect complete employment in the state, including proprietors, self-employed workers, and others not typically included in regional or state data, as well as benefits and all forms of employer contributions. As such, Lightcast industry earnings-per-worker numbers are generally higher than those reported by other sources.

Chapter 2:

Economic impacts on the NMC Service Area economy

NMC impacts the NMC Service Area economy in a variety of ways. The college is an employer and buyer of goods and services. It attracts monies that otherwise would not have entered the regional economy through its day-to-day and construction operations, and the expenditures of its students. Further, it provides students with the knowledge, skills, and abilities they need to become productive citizens and add to the overall output of the region.

IN THIS CHAPTER, we estimate the following economic impacts of NMC: 1) the operations spending impact, 2) the student spending impact, and 3) the alumni impact, measuring the income added in the region as former students expand the regional economy's stock of human capital.

When exploring each of these economic impacts, we consider the following hypothetical question:

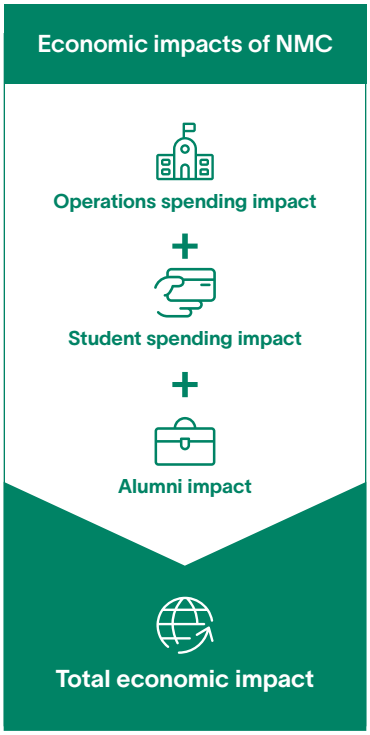
How would economic activity change in the NMC Service Area if NMC and all its alumni did not exist in FY 2021-22?

Each of the economic impacts should be interpreted according to this hypothetical question. Another way to think about the question is to realize that we measure net impacts, not gross impacts. Gross impacts represent an upper-bound estimate in terms of capturing all activity stemming from the college; however, net impacts reflect a truer measure of economic impact since they demonstrate what would not have existed in the regional economy if not for the college.

Economic impact analyses use different types of impacts to estimate the results. The impact focused on in this study assesses the change in income. This measure is similar to the commonly used gross regional product (GRP). Income may be further broken out into the **labor income impact**, also known as earnings, which assesses the change in employee compensation; and the **non-labor income impact**, which assesses the change in business profits. Together, labor income and non-labor income sum to total income.

Another way to state the impact is in terms of **jobs**, a measure of the number of full- and part-time jobs that would be required to support the change in income. Finally, a frequently used measure is the **sales impact**, which comprises the change in business sales revenue in the economy as a result of increased economic activity. It is important to bear in mind, however, that much of this sales revenue leaves the regional economy through intermediary transactions and costs.[8] All of these measures – added labor and non-labor income, total income, jobs, and sales – are used to estimate the economic impact results presented in this chapter. The analysis breaks out the impact measures into different components, each based on the economic effect that caused the impact. The following is a list of each type of effect presented in this analysis:

- The **initial effect** is the exogenous shock to the economy caused by the initial spending of money, whether to pay for salaries and wages, purchase goods or services, or cover operating expenses. This effect is only represented by labor income and sales and has zero non-labor income, as the initial effect of the college spending stems exclusively from its employees' salaries, wages, and



8 See Appendix 4 for an example of the intermediary costs included in the sales impact but not in the income impact.

benefits, while any non-earnings direct expenditures of the college are reflected in the sales amount.

- The initial round of spending creates more spending in the economy, resulting in what is commonly known as the **multiplier effect**. The multiplier effect comprises the additional activity that occurs across all industries in the economy and may be further decomposed into the following three types of effects:
  - The **direct effect** refers to the additional economic activity that occurs as the industries affected by the initial effect spend money to purchase goods and services from their supply chain industries.
  - The **indirect effect** occurs as the supply chain of the initial industries creates even more activity in the economy through inter-industry spending.
  - The **induced effect** refers to the economic activity created by the household sector as the businesses affected by the initial, direct, and indirect effects raise salaries or hire more people.

The terminology used to describe the economic effects listed above differs slightly from that of other commonly used input-output models, such as IMPLAN. For example, the initial effect in this study is called the "direct effect" by IMPLAN, as shown below. Further, the term "indirect effect" as used by IMPLAN refers to the combined direct and indirect effects defined in this study. To avoid confusion, readers are encouraged to interpret the results presented in this chapter in the context of the terms and definitions listed above. Note that, regardless of the effects used to decompose the results, the total impact measures are analogous.

Lightcast	Initial	Direct	Indirect	Induced
IMPLAN	Direct	Indirect		Induced

Multiplier effects in this analysis are derived using Lightcast Multi-Regional Social Accounting Matrix (MR-SAM) input-output model that captures the interconnection of industries, government, and households in the region. The Lightcast MR-SAM contains approximately 1,000 industry sectors at the highest level of detail available in the North American Industry Classification System (NAICS) and supplies the industry-specific multipliers required to determine the impacts associated with increased activity within a given economy. The multi-regional capacity of the MR-SAM allows impacts to be measured in the region and state simultaneously, accounting for NMC's activity in each area, as well as each area's economic characteristics. In this analysis, impacts on the region include impacts from the college's regional activity, as well as the indirect and induced multiplier effects that reach the region from the college's activity in the rest of the state. For more information on the Lightcast MR-SAM model and its data sources, see Appendix 5.

Net impacts reflect a truer measure of economic impact since they demonstrate what would not have existed in the regional economy if not for the college.

Operations spending impact

Faculty and staff payroll is part of the region's total earnings, and the spending of employees for groceries, apparel, and other household expenditures helps support regional businesses. The college itself purchases supplies and services, and many of its vendors are located in the NMC Service Area. These expenditures create a ripple effect that generates still more jobs and higher wages throughout the economy.

Table 2.1 presents college expenditures for the following three categories: 1) salaries, wages, and benefits, 2) operation and maintenance of plant,[9] and 3) all other expenditures, including purchases for supplies and services. Also included in all other expenditures are expenses associated with grants and scholarships. Many students receive grants and scholarships that exceed the cost of tuition and fees. The college then dispenses this residual financial aid to students, who spend it on living expenses. Some of this spending takes place in the region, and is therefore an injection of new money into the regional economy that would not have happened if NMC did not exist. In this analysis, we exclude expenses for depreciation and interest due to the way those measures are calculated in the national input-output accounts, and because depreciation represents the devaluing of the college's assets rather than an outflow of expenditures.[10]

Table 2.1: NMC expenses by function (excluding depreciation & interest), FY 2021-22

Expense category	In-region expenditures (thousands)	Out-of-region expenditures (thousands)	Total expenditures (thousands)
Employee salaries, wages, and benefits	$28,133	$2,271	$30,404
Operation and maintenance of plant	$3,950	$1,399	$5,349
All other expenditures	$8,110	$10,342	$18,452
Total	**$33,704**	**$20,501**	**$54,205**

Source: Data provided by NMC, and the Lightcast impact model.

9 Capital construction expenses are included under operation and maintenance of plant.

10 This aligns with the economic impact guidelines set by the Association of Public and Land-Grant Universities. Ultimately, excluding these measures results in more conservative and defensible estimates.

The first step in estimating the multiplier effects of the college's operational expenditures is to map these categories of expenditures to the approximately 1,000 industries of the Lightcast MR-SAM model. Assuming that the spending patterns of college personnel approximately match those of the average U.S. consumer, we map salaries, wages, and benefits to spending on industry outputs using national household expenditure coefficients provided by Lightcast national SAM. All NMC employees work in the NMC Service Area (see Table 1.1), and therefore we consider all of the salaries, wages, and benefits. For the other two expenditure categories (i.e., operation and maintenance of plant and all other expenditures), we assume the college's spending patterns approximately match national averages and apply the national spending coefficients for NAICS 903612 (Colleges, Universities, and Professional Schools (Local Government)).[11] Operation and maintenance of plant expenditures are mapped to the industries that relate to capital construction, maintenance, and support, while the college's remaining expenditures are mapped to the remaining industries.

We now have three vectors of expenditures for NMC: one for salaries, wages, and benefits; another for operation and maintenance of plant; and a third for the college's purchases of supplies and services. Portions of these expenditures occurring inside the NMC Service Area and outside the region were provided by NMC. Table 2.1 shows the break-out of NMC expenditures in FY 2021-22. The in-region, industry-specific, expenditures associated with the college feed into the MR-SAM[12] model's multiplier matrix, which in turn provides an estimate of the associated multiplier effects on regional labor income, non-labor income, total income, sales, and jobs.

Table 2.2 presents the economic impact of college operations spending. The people employed by NMC and their salaries, wages, and benefits comprise the initial effect, shown in the top row of the table in terms of labor income, non-labor income, total added income, sales, and jobs. The additional impacts created by the initial effect appear in the next four rows under the section labeled multiplier effect. Summing the initial and multiplier effects, the gross impacts are $39.3 million in labor income and $6.9 million in non-labor income. This sums to a total impact of $46.2 million in total added income associated with the spending of the college and its employees in the region. This is equivalent to supporting 838 jobs.

The $46.2 million in gross impact is often reported by researchers as the total impact. We go a step further to arrive at a net impact by applying a counterfactual scenario, i.e., what would have happened if a given event – in this case, the expenditure of in-region funds on NMC – had not occurred. NMC received an estimated 45% of its funding from sources within the NMC Service Area. This portion of the college's funding came from the tuition and fees paid by resident students, from the auxiliary revenue and donations from private sources located within the region, from state and local taxes, and from the financial aid issued to students by state and local government. We must account for the opportunity cost of this in-region funding. Had other industries received these monies rather than NMC, income impacts would have still been created in the

11 See Appendix 2 for a definition of NAICS.

12 See Appendix 5 for a description of Lightcast's MR-SAM model.

economy. In economic analysis, impacts that occur under counterfactual conditions are used to offset the impacts that actually occur in order to derive the true impact of the event under analysis.

We estimate this counterfactual by simulating a scenario where in-region monies spent on the college are instead spent on consumer goods and savings. This simulates the in-region monies being returned to the taxpayers and being spent by the household sector. Our approach is to establish the total amount spent by in-region students and taxpayers on NMC, map this to the detailed industries of the MR-SAM model using national household expenditure coefficients, use the industry regional purchase coefficients (RPCs) to estimate in-region spending, and run the in-region spending through the MR-SAM model's multiplier matrix to derive multiplier effects. RPCs represent a measure of the overall demand for the commodities produced by each sector that is satisfied by regional suppliers, for each of the approximately 1,000 industries in the MR-SAM model. For example, if 40% of the demand for NAICS 541211 (Offices of Certified Public Accountants) is satisfied by regional suppliers, the RPC for that industry is 40%. The remaining 60% of the demand for NAICS 541211 is provided by suppliers located outside the region. The results of this overall exercise are shown as negative values in the row labeled *less alternative uses of funds* in Table 2.2.

The total net impact of the college's operations is **$37.4 million** in total added income, which is equivalent to supporting **749 jobs**.

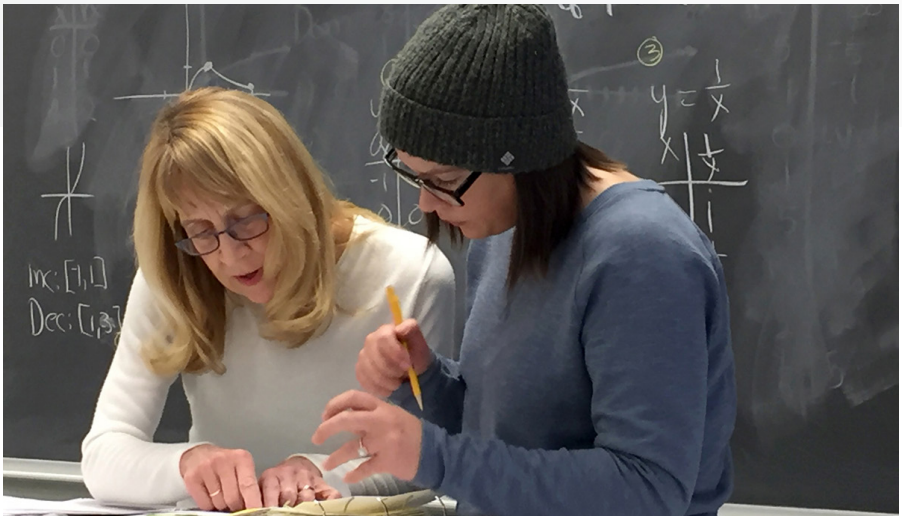
The total net impact of the college's operations is equal to the gross impact less the impact of the alternative use of funds – the opportunity cost of the regional money. As shown in the last row of Table 2.2, the total net impact is approximately $35.0 million in labor income and $2.3 million in non-labor income. This sums together to $37.4 million in total added income and is equivalent to supporting 749 jobs. These impacts represent new economic activity created in the regional economy solely attributable to the operations of NMC.

Table 2.2: Operations spending impact, FY 2021-22

	Labor income (thousands)	Non-labor income (thousands)	Total income (thousands)	Sales (thousands)	Jobs supported
Initial effect	**$30,404**	**$0**	**$30,404**	**$54,205**	**672**
Multiplier effect					
Direct effect	$3,946	$2,008	$5,955	$12,060	66
Indirect effect	$266	$100	$366	$722	4
Induced effect	$4,680	$4,751	$9,431	$14,865	96
Total multiplier effect	**$8,892**	**$6,859**	**$15,752**	**$27,648**	**166**
Gross impact (initial + multiplier)	**$39,296**	**$6,859**	**$46,155**	**$81,852**	**838**
Less alternative uses of funds	-$4,249	-$4,540	-$8,789	-$21,772	-89
Net impact	**$35,047**	**$2,319**	**$37,366**	**$60,081**	**749**

Source: Lightcast impact model.

Student spending impact



Both in-region and out-of-region students contribute to the student spending impact of NMC; however, not all of these students can be counted toward the impact. Of the in-region students, only the impact from those students who were retained, or who would have left the region to seek education elsewhere had they not attended NMC, is measured. Students who would have stayed in the region anyway are not counted toward the impact since their monies would have been added to the NMC Service Area economy regardless of NMC. In addition, only the out-of-region students who relocated to the NMC Service Area to attend the college are considered. Students who commute from outside the region or take courses online are not counted towards the student spending impact because they are not adding money from living expenses to the region.

While there were 3,142 students attending NMC who originated from the NMC Service Area (excluding personal enrichment students and dual credit high school students),[13] not all of them would have remained in the region if not for the existence of NMC. We apply a conservative assumption that 10% of these students would have left the NMC Service Area for other education opportunities if NMC did not exist.[14] Therefore, we recognize that the in-region spending of 314 students retained in the region is attributable to NMC. These students, called retained students, spent money at businesses in the region for everyday needs such as groceries, accommodation, and transportation.

13 Note that because the college was unable to provide origin data for their non-credit students, we assume that all non-credit students originated from within the region.

14 See Appendix 1 for a sensitivity analysis of the retained student variable.

Of the retained students, we estimate 11 lived on campus while attending the college. While these students spend money while attending the college, we exclude most of their spending for room and board since these expenditures are already reflected in the impact of the college's operations.

Relocated students are also accounted for in NMC's student spending impact. An estimated 19 students came from outside the region and lived off campus while attending NMC in FY 2021-22. Another estimated 265 out-of-region students lived on campus while attending the college. We apply the same adjustment as described above to the students who relocated and lived on campus during their time at the college. Collectively, the off-campus expenditures of out-of-region students supported jobs and created new income in the regional economy.[15]

The average costs for students appear in the first section of Table 2.3, equal to $12,620 per student. Note that this table excludes expenses for books and supplies, since many of these costs are already reflected in the operations impact discussed in the previous section. We multiply the $12,620 in annual costs by the 322 students who either were retained or relocated to the region because of NMC and lived in-region but off campus. This provides us with an estimate of their total spending. For students living on campus, we multiply the per-student cost of off-campus food purchases (assumed to be equal to 25% of room and board), personal expenses, and transportation by the number of students who lived in the region but on campus while attending (276 students). Altogether, off-campus spending of relocated and retained students generated

Table 2.3: Average student costs and total sales generated by relocated and retained students in the NMC Service Area, FY 2021-22

Room and board	$9,100
Personal expenses	$1,992
Transportation	$1,528
Total expenses per student	**$12,620**
Number of students retained	*314*
Number of students relocated	*284*
Gross retained student sales	$3,891,494
Gross relocated student sales	$1,775,455
Total gross off-campus sales	**$5,666,949**
Wages and salaries paid to student workers*	$31,644
Net off-campus sales	**$5,635,305**

*This figure reflects only the portion of payroll that was used to cover the living expenses of relocated and retained student workers who lived in the region.

Source: Student costs and wages provided by NMC. The number of relocated and retained students who lived in the region off campus or on campus while attending is derived by Lightcast from the student origin data and in-term residence data provided by NMC.

15 Online students and students who commuted to the NMC Service Area from outside the region are not considered in this calculation because it is assumed their living expenses predominantly occurred in the region where they resided during the analysis year. We recognize that not all online students live outside the region, but keep the assumption given data limitations.

gross sales of $5.7 million. This figure, once net of the monies paid to student workers, yields net off-campus sales of $5.6 million, as shown in the bottom row of Table 2.3.

Estimating the impacts generated by the $5.6 million in student spending follows a procedure similar to that of the operations impact described above. We distribute the $5.6 million in sales to the industry sectors of the MR-SAM model, apply RPCs to reflect in-region spending, and run the net sales figures through the MR-SAM model to derive multiplier effects.

Table 2.4 presents the results. The initial effect is purely sales-oriented and there is no change in labor or non-labor income. The impact of relocated and retained student spending thus falls entirely under the multiplier effect. The total impact of student spending is $1.9 million in labor income and $1.3 million in non-labor income. This sums together to $3.2 million in total added income and is equivalent to supporting 51 jobs. These values represent the direct effects created at the businesses patronized by the students, the indirect effects created by the supply chain of those businesses, and the effects of the increased spending of the household sector throughout the regional economy as a result of the direct and indirect effects.

Table 2.4: **Student spending impact, FY 2021-22**

	Labor income (thousands)	Non-labor income (thousands)	Total income (thousands)	Sales (thousands)	Jobs supported
Initial effect	**$0**	**$0**	**$0**	**$5,635**	**0**
Multiplier effect					
Direct effect	$1,216	$855	$2,071	$3,654	33
Indirect effect	$260	$195	$455	$835	8
Induced effect	$385	$273	$658	$1,145	10
Total multiplier effect	**$1,861**	**$1,323**	**$3,184**	**$5,635**	**51**
Total impact (initial + multiplier)	**$1,861**	**$1,323**	**$3,184**	**$11,270**	**51**

Source: Lightcast impact model.

The total impact of student spending is **$3.2 million** in total added income and is equivalent to supporting **51 jobs**.

Alumni impact

In this section, we estimate the economic impacts stemming from the added labor income of alumni in combination with their employers' added non-labor income. This impact is based on the number of students who have attended NMC *throughout its history*. We then use this total number to consider the impact of those students in the single FY 2021-22. Former students who earned a degree as well as those who may not have finished their degree or did not take courses for credit are considered alumni.

> The greatest economic impact of NMC stems from the added human capital—the knowledge, creativity, imagination, and entrepreneurship—found in its alumni.

While NMC creates an economic impact through its operations and student spending, the greatest economic impact of NMC stems from the added human capital – the knowledge, creativity, imagination, and entrepreneurship – found in its alumni. While attending NMC, students gain experience, education, and the knowledge, skills, and abilities that increase their productivity and allow them to command a higher wage once they enter the workforce. But the reward of increased productivity does not stop there. Talented professionals make capital more productive too (e.g., buildings, production facilities, equipment¬). The employers of NMC alumni enjoy the fruits of this increased productivity in the form of additional non-labor income (i.e., higher profits).

The methodology here differs from the previous impacts in one fundamental way. Whereas the previous spending impacts depend on an annually renewed injection of new sales into the regional economy, the alumni impact is the result of years of

past instruction and the associated accumulation of human capital. The initial effect of alumni is comprised of two main components. The first and largest of these is the added labor income of NMC's former students. The second component of the initial effect is comprised of the added non-labor income of the businesses that employ former students of NMC.

We begin by estimating the portion of alumni who are employed in the workforce. To estimate the historical employment patterns of alumni in the region, we use the following sets of data or assumptions: 1) settling-in factors to determine how long it takes the average student to settle into a career;[16] 2) death, retirement, and unemployment rates from the National Center for Health Statistics, the Social Security Administration, and the Bureau of Labor Statistics; and 3) state migration data from the Internal Revenue Service.[17] The result is the estimated portion of alumni from each previous year who were still actively employed in the region as of FY 2021-22.

The next step is to quantify the skills and human capital that alumni acquired from the college. We use the students' production of CHEs as a proxy for accumulated human capital. The average number of CHEs completed per student in FY 2021-22 was 11.6. To estimate the number of CHEs present in the workforce during the analysis year, we use the college's historical student headcount over the past 43 years, from FY 1979-80 to FY 2021-22. We apply a 43-year time horizon to include all alumni active in the regional workforce who have not reached the average retirement age of 67. The time horizon, or number of years in the workforce, is calculated by subtracting NMC's student oldest cohort average age (25 years per Lightcast's study for FY 2015-16) from the retirement age of 67. However, because the alumni impact is based on credits achieved and not headcount, we calculate and use an average age per credit rather than per student. We inform this average age by the historical student average age from NMC's economic impact study conducted by Lightcast for FY 2015-16.

We multiply the 11.6 average CHEs per student by the headcounts that we estimate are still actively employed from each of the previous years.[18] Students who enroll at the college more than one year are counted at least twice in the historical enrollment data. However, CHEs remain distinct regardless of when and by whom they were earned, so there is no duplication in the CHE counts. We estimate there are approximately 1.5 million CHEs from alumni active in the workforce.

Next, we estimate the value of the CHEs, or the skills and human capital acquired by NMC alumni. This is done using the *incremental* added labor income stemming from the students' higher wages. The incremental added labor income is the difference between the wage earned by NMC alumni and the alternative wage they would have

16 Settling-in factors are used to delay the onset of the benefits to students in order to allow time for them to find employment and settle into their careers. In the absence of hard data, we assume a range between one and three years for students who graduate with a certificate or a degree, and between one and five years for returning students.

17 According to a study performed by Pew Research Center, people who have already moved are more likely to move again than people who do not move. Therefore, migration rates are dampened to account for the idea that if they do not move in the first two years after leaving the college, then they are less likely to migrate out compared to the average person.

18 This assumes the average level of study from past years is equal to the level of study of students today. Lightcast used data provided by NMC for a previous study to estimate students' credit load in prior years.

earned had they not attended NMC. Using the regional incremental earnings, credits required, and distribution of credits at each level of study, we estimate the average value per CHE to equal $116. This value represents the regional average incremental increase in wages that alumni of NMC received during the analysis year for every CHE they completed.

Because workforce experience leads to increased productivity and higher wages, the value per CHE varies depending on the students' workforce experience, with the highest value applied to the CHEs of students who had been employed the longest by FY 2021-22, and the lowest value per CHE applied to students who were just entering the workforce. More information on the theory and calculations behind the value per CHE appears in Appendix 6. In determining the amount of added labor income attributable to alumni, we multiply the CHEs of former students in each year of the historical time horizon by the corresponding average value per CHE for that year, and then sum the products together. This calculation yields approximately $174.1 million in gross labor income from increased wages received by former students in FY 2021-22 (as shown in Table 2.5).

Table 2.5: Number of CHEs in workforce and initial labor income created in the NMC Service Area, FY 2021-22

Number of CHEs in workforce	1,504,877
Average value per CHE	$116
Initial labor income, gross	**$174,110,263**
Adjustments for counterfactual scenarios	
Percent reduction for alternative education opportunities	15%
Percent reduction for adjustment for labor import effects	50%
Initial labor income, net	**$73,996,862**

Source: Lightcast impact model.

The next two rows in Table 2.5 show two adjustments used to account for counterfactual outcomes. As discussed above, counterfactual outcomes in economic analysis represent what would have happened if a given event had not occurred. The event in question is the education and training provided by NMC and subsequent influx of skilled labor into the regional economy. The first counterfactual scenario that we address is the adjustment for alternative education opportunities. In the counterfactual scenario where NMC does not exist, we assume a portion of NMC alumni would have received a comparable education elsewhere in the region or would have left the region and received a comparable education and then returned to the region. The incremental added labor income that accrues to those students cannot be counted toward the added labor income from NMC alumni. The adjustment for alternative education opportunities amounts to a 15% reduction of the $174.1 million in added labor income. This means that 15% of the added labor income from NMC alumni would have been generated in the region anyway, even if the college did not exist. For more information on the alternative education adjustment, see Appendix 7.

The other adjustment in Table 2.5 accounts for the importation of labor. Suppose NMC did not exist and in consequence there were fewer skilled workers in the region. Businesses could still satisfy some of their need for skilled labor by recruiting from outside the NMC Service Area. We refer to this as the labor import effect. Lacking information on its possible magnitude, we assume 50% of the jobs that students fill at regional businesses could have been filled by workers recruited from outside the region if the college did not exist.[19] Consequently, the gross labor income must be adjusted to account for the importation of this labor, since it would have happened regardless of the presence of the college. We conduct a sensitivity analysis for this assumption in Appendix 1. With the 50% adjustment, the net added labor income added to the economy comes to $74.0 million, as shown in Table 2.5.

The $74.0 million in added labor income appears under the initial effect in the labor income column of Table 2.6. To this we add an estimate for initial non-labor income. As discussed earlier in this section, businesses that employ former students of NMC see higher profits as a result of the increased productivity of their capital assets. To estimate this additional income, we allocate the initial increase in labor income ($74.0 million) to the six-digit NAICS industry sectors where students are most likely to be employed. This allocation entails a process that maps completers in the region to the detailed occupations for which those completers have been trained, and then maps the detailed occupations to the six-digit industry sectors in the MR-SAM model.[20] Using a crosswalk created by National Center for Education Statistics (NCES) and the Bureau of Labor Statistics, we map the breakdown of the college's completers to the approximately 700 detailed occupations in the Standard Occupational Classification (SOC) system. Finally, we apply a matrix of wages by industry and by occupation from the MR-SAM model to map the occupational distribution of the $74.0 million in initial labor income effects to the detailed industry sectors in the MR-SAM model.[21]

Table 2.6: Alumni impact, FY 2021-22

	Labor income (thousands)	Non-labor income (thousands)	Total income (thousands)	Sales (thousands)	Jobs supported
Initial effect	**$73,997**	**$32,449**	**$106,446**	**$218,589**	**1,494**
Multiplier effect					
Direct effect	$12,848	$5,387	$18,235	$37,917	269
Indirect effect	$3,616	$1,541	$5,157	$10,665	75
Induced effect	$23,071	$11,040	$34,110	$67,994	467
Total multiplier effect	**$39,534**	**$17,968**	**$57,502**	**$116,576**	**811**
Total impact (initial + multiplier)	**$113,531**	**$50,417**	**$163,948**	**$335,164**	**2,305**

Source: Lightcast impact model.

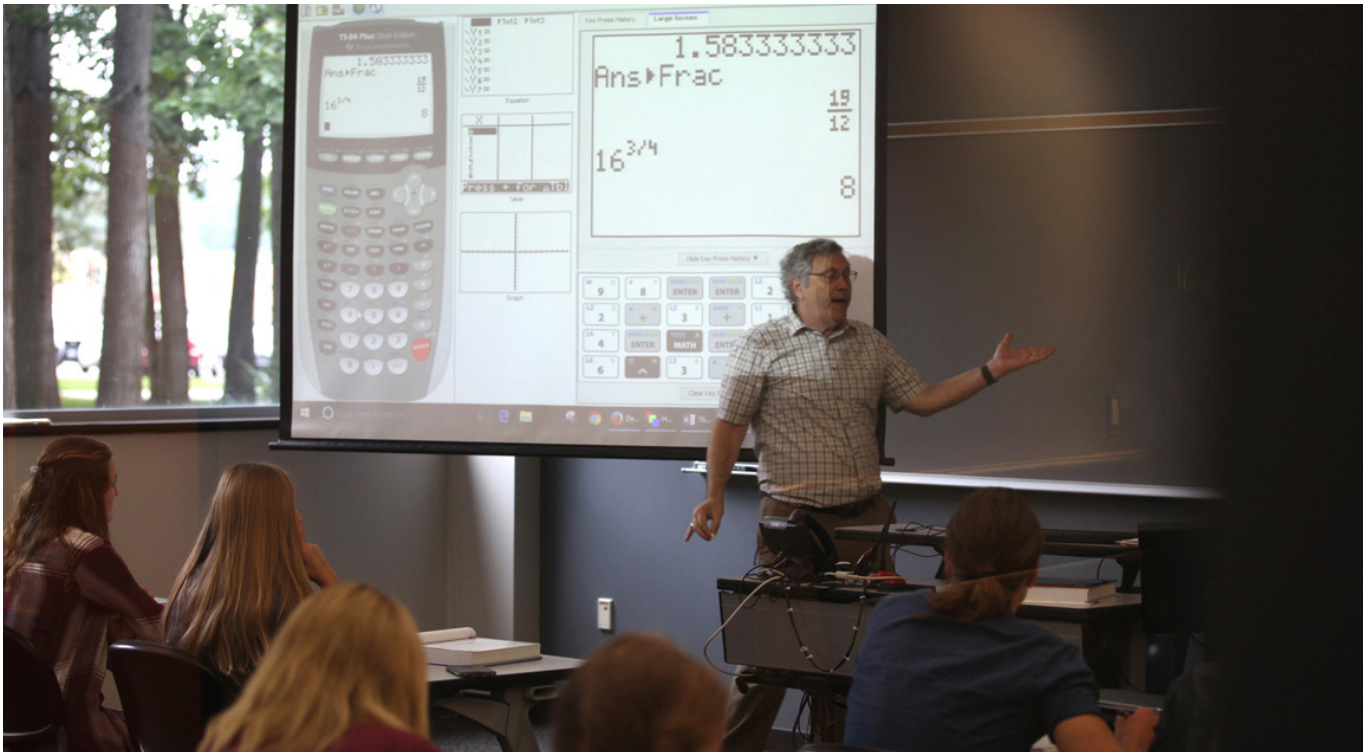
19 A similar assumption is used by Walden (2014) in his analysis of the Cooperating Raleigh Colleges.

20 Completer data comes from the Integrated Postsecondary Education Data System (IPEDS), which organizes program completions according to the Classification of Instructional Programs (CIP) developed by the National Center for Education Statistics (NCES).

21 For example, if the MR-SAM model indicates that 20% of wages paid to workers in SOC 51-4121 (Welders) occur in NAICS 332313 (Plate Work Manufacturing), then we allocate 20% of the initial labor income effect under SOC 51-4121 to NAICS 332313.

Once these allocations are complete, we apply the ratio of non-labor to labor income provided by the MR-SAM model for each sector to our estimate of initial labor income. This computation yields an estimated $32.4 million in added non-labor income attributable to the college's alumni. Summing initial labor and non-labor income together provides the total initial effect of alumni productivity in the NMC Service Area economy, equal to approximately $106.4 million. To estimate multiplier effects, we convert the industry-specific income figures generated through the initial effect to sales using sales-to-income ratios from the MR-SAM model. We then run the values through the MR-SAM's multiplier matrix.

Table 2.6 shows the multiplier effects of alumni. Multiplier effects occur as alumni generate an increased demand for consumer goods and services through the expenditure of their higher wages. Further, as the industries where alumni are employed increase their output, there is a corresponding increase in the demand for input from the industries in the employers' supply chain. Together, the incomes generated by the expansions in business input purchases and household spending constitute the multiplier effect of the increased productivity of the college's alumni. The final results are $39.5 million in added labor income and $18 million in added non-labor income, for an overall total of $57.5 million in multiplier effects. The grand total of the alumni impact is $163.9 million in total added income, the sum of all initial and multiplier labor and non-labor income effects. This is equivalent to supporting 2,305 jobs.



Total NMC impact

The total economic impact of NMC on the NMC Service Area can be generalized into two broad types of impacts. First, on an annual basis, NMC generates a flow of spending that has a significant impact on the regional economy. The impacts of this spending are captured by the operations and student spending impacts. While not insignificant, these impacts do not capture the true purpose of NMC. The fundamental mission of NMC is to foster human capital. Every year, a new cohort of former NMC students adds to the stock of human capital in the region, and a portion of alumni continues to add to the regional economy.

Table 2.7 displays the grand total impacts of NMC on the NMC Service Area economy in FY 2021-22. For context, the percentages of NMC compared to the total labor income, total non-labor income, combined total income, sales, and jobs in the NMC Service Area, as presented in Table 1.3 and Figure 1.3, are included. The total added value of NMC is $204.5 million, equivalent to 2.0% of the GRP of the NMC Service Area. By comparison, this contribution that the college provides on its own is nearly as large as the entire Transportation & Warehousing industry in the region. NMC's total impact supported 3,106 jobs in FY 2021-22. For perspective, this means that one out of every 42 jobs in the NMC Service Area is supported by the activities of NMC and its students.

Table 2.7: Total NMC impact, FY 2021-22

	Labor income (thousands)	Non-labor income (thousands)	Total income (thousands)	Sales (thousands)	Jobs supported
Operations spending	$35,047	$2,319	$37,366	$60,081	749
Student spending	$1,861	$1,323	$3,184	$11,270	51
Alumni	$113,531	$50,417	$163,948	$335,164	2,305
Total impact	**$150,439**	**$54,059**	**$204,498**	**$406,515**	**3,106**
% of the NMC Service Area economy	2.1%	1.7%	2.0%	1.8%	2.4%

Source: Lightcast impact model.

These impacts from the college and its students stem from different industry sectors and spread throughout the regional economy. Table 2.8 displays the total impact of NMC by each industry sector based on their two-digit NAICS code. The table shows the total impact of operations, students, and alumni, as shown in Table 2.7, broken down by each industry sector's individual impact on the regional economy using processes outlined earlier in this chapter. By showing the impact from individual industry sectors, it is possible to see in finer detail the industries that drive the greatest impact on the regional economy from the spending of the college and its students and from where NMC alumni are employed. For example, the spending of NMC and its students as well as the activities of its alumni in the Health Care & Social Assistance industry sector generated an impact of $21.9 million in FY 2021-22.

Table 2.8: Total NMC impact by industry, FY 2021-22

Industry sector	Total income (thousands)	Jobs supported
Government, Education	$34,178	734
Retail Trade	$28,930	482
Health Care & Social Assistance	$21,907	281
Real Estate & Rental & Leasing	$14,541	243
Government, Non-Education	$14,345	163
Construction	$11,802	180
Wholesale Trade	$11,495	54
Manufacturing	$11,005	106
Accommodation & Food Services	$8,794	173
Finance & Insurance	$8,578	58
Professional & Technical Services	$8,308	120
Transportation & Warehousing	$6,841	80
Information	$5,882	35
Other Services (except Public Administration)	$5,182	171
Administrative & Waste Services	$3,302	65
Utilities	$2,365	4
Arts, Entertainment, & Recreation	$2,278	64
Educational Services	$2,023	62
Mining, Quarrying, & Oil and Gas Extraction	$1,261	7
Agriculture, Forestry, Fishing, & Hunting	$823	18
Management of Companies & Enterprises	$659	6
Total impact	**$204,498**	**3,106**

Source: Lightcast impact model.

Chapter 3:

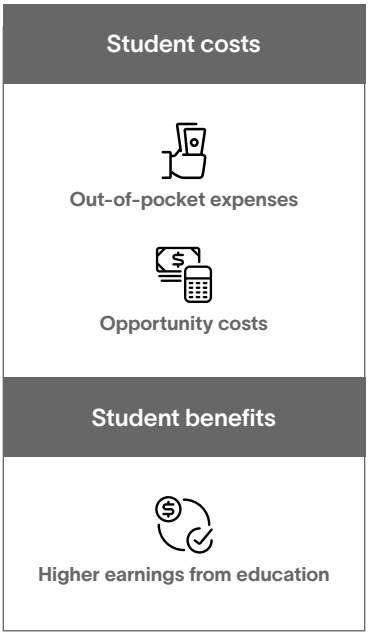
Investment analysis

The benefits generated by NMC affect the lives of many people. The most obvious beneficiaries are the college's students; they give up time and money to go to the college in return for a lifetime of higher wages and improved quality of life. But the benefits do not stop there. As students earn more, communities and citizens throughout Michigan benefit from an enlarged economy and a reduced demand for social services. In the form of increased tax revenues and public sector savings, the benefits of education extend as far as the state and local government.

Investment analysis is the process of evaluating total costs and measuring these against total benefits to determine whether or not a proposed venture will be profitable. If benefits outweigh costs, then the investment is worthwhile. If costs outweigh benefits, then the investment will lose money and could be considered infeasible. In this chapter, we evaluate NMC as an investment from the perspectives of students, taxpayers, and society.

Student perspective

To enroll in postsecondary education, students pay for tuition and forgo monies that otherwise they would have earned had they chosen to work instead of attend college. From the perspective of students, education is the same as an investment; i.e., they incur a cost, or put up a certain amount of money, with the expectation of receiving benefits in return. The total costs consist of the tuition and fees that students pay and the opportunity cost of forgone time and money. The benefits are the higher earnings that students receive as a result of their education.



Calculating student costs

Student costs consist of three main items: direct outlays, opportunity costs, and future principal and interest costs incurred from student loans. Direct outlays include tuition and fees, equal to $18.3 million from Figure 1.1. Direct outlays also include the cost of books and supplies. On average, full-time students spent $540 each on books and supplies during the reporting year.[22] Multiplying this figure by the number of full-time equivalents (FTEs) produced by NMC in FY 2021-22[23] generates a total cost of $942.7 thousand for books and supplies.

In order to pay the cost of tuition, many students had to take out loans. These students not only incur the cost of tuition from the college but also incur the interest cost of taking out loans. In FY 2021-22, students received a total of $4.2 million in federal loans to attend NMC.[24] Students pay back these loans along with interest over the span of several years in the future. Since students pay off these loans over time, they accrue no initial cost during the analysis year. Hence, to avoid double counting, the $4.2 million in federal loans is subtracted from the costs incurred by students in FY 2021-22.

In addition to the cost of tuition, books, and supplies, students also experienced an opportunity cost of attending college during the analysis year. Opportunity cost is the most difficult component of student costs to estimate. It measures the value of time and earnings forgone by students who go to college rather than work. To calculate it,

22 Based on the data provided by NMC.

23 A single FTE is equal to 30 CHEs, so there were 1,746 FTEs produced by students in FY 2021-22, equal to 52,374 CHEs divided by the weighted average number of CHEs per student (excluding personal enrichment students).

24 Due to data limitations, only federal loans are considered in this analysis.

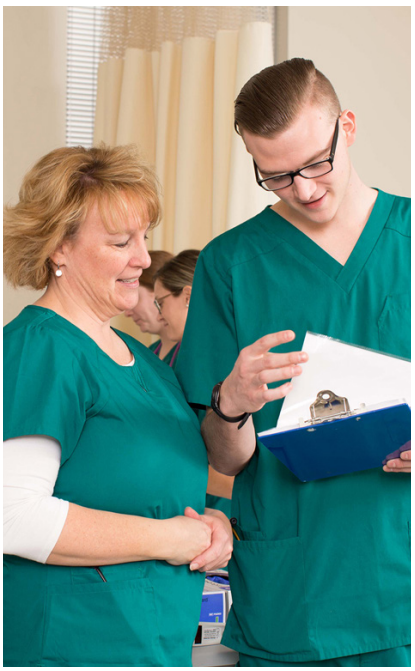
we need to know the difference between the students' full earning potential and what they actually earn while attending the college.

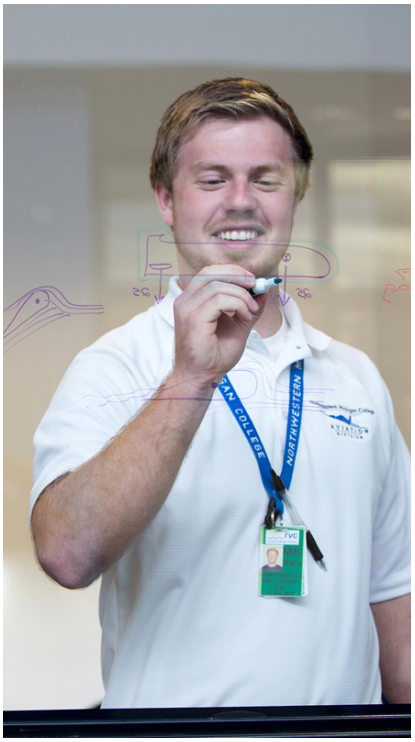
We derive the students' full earning potential by weighting the average annual earnings levels in Table 1.4 according to the education level breakdown of the student population at the start of the analysis year.[25] However, the earnings levels in Table 1.4 reflect what average workers earn at the midpoint of their careers, not while attending the college. Because of this, we adjust the earnings levels to the average age of the student population (26) to better reflect their wages at their current age.[26] This calculation yields an average full earning potential of $18,731 per student.

In determining how much students earn while enrolled in postsecondary education, an important factor to consider is the time that they actually spend on postsecondary education, since this is the only time that they are required to give up a portion of their earnings. We use the students' CHE production as a proxy for time, under the assumption that the more CHEs students earn, the less time they have to work, and, consequently, the greater their forgone earnings. Overall, students attending NMC in FY 2021-22 earned an average of 11.8 CHEs per student (excluding personal enrichment students and dual credit high school students), which is approximately equal to 39% of a full academic year.[27] We thus include no more than $7,379 (or 39%) of the students' full earning potential in the opportunity cost calculations.

Another factor to consider is the students' employment status while enrolled in postsecondary education. It is estimated that 73% of students are employed.[28] For the remainder of students, we assume that they are either seeking work or planning to seek work once they complete their educational goals (with the exception of personal enrichment students, who are not included in this calculation). By choosing to enroll, therefore, non-working students give up everything that they can potentially earn during the academic year (i.e., the $7,379). The total value of their forgone earnings thus comes to $8.1 million.

Working students are able to maintain all or part of their earnings while enrolled. However, many of them hold jobs that pay less than statistical averages, usually because those are the only jobs they can find that accommodate their course schedule. These jobs tend to be at entry level, such as restaurant servers or cashiers. To account for this, we assume that working students hold jobs that pay 83% of what they would have earned had they chosen to work full-time rather than go to college.[29] The remaining 17% comprises the percentage of their full earning potential that they forgo. Obviously, this assumption varies by person; some students forgo more and others less. Since





25 This is based on students who reported their prior level of education to NMC. The prior level of education data was then adjusted to exclude dual credit high school students.

26 Further discussion on this adjustment appears in Appendix 6.

27 Equal to 11.8 CHEs divided by 30, the assumed number of CHEs in a full-time academic year.

28 Based on data provided by NMC. This figure excludes dual credit high school students, who are not included in the opportunity cost calculations.

29 The 83% assumption is based on the average hourly wage of jobs commonly held by working students divided by the regional average hourly wage. Occupational wage estimates are published by the Bureau of Labor Statistics (see http://www.bls.gov/oes/current/oes_nat.htm).

we do not know the actual jobs that students hold while attending, the 17% in forgone earnings serves as a reasonable average.

Working students also give up a portion of their leisure time in order to attend higher education institutions. According to the Bureau of Labor Statistics American Time Use Survey, students forgo up to 0.1 hours of leisure time per day.[30] Assuming that an hour of leisure is equal in value to an hour of work, we derive the total cost of leisure by multiplying the number of leisure hours forgone during the academic year by the average hourly pay of the students' full earning potential. For working students, therefore, their total opportunity cost is $4.0 million, equal to the sum of their forgone earnings ($3.6 million) and forgone leisure time ($404.0 thousand).

Thus far we have discussed student costs during the analysis year. However, recall that students take out student loans to attend college during the year, which they will have to pay back over time. The amount they will be paying in the future must be a part of their decision to attend the college today. Students who take out loans are not only required to pay back the principal of the loan but to also pay back a certain amount in interest. The first step in calculating students' loan interest cost is to determine the payback time for the loans. The $4.2 million in loans was awarded to 731 students, averaging $5,786 per student in the analysis year. However, this figure represents only one year of loans. Because loan payback time is determined by total indebtedness, we assume that since NMC is a two-year college, students will be indebted twice that amount, or $11,572 on average. According to the U.S. Department of Education, this level of indebtedness will take up to 15 years to pay back under the standard repayment plan.[31]

This indebtedness calculation is used solely to estimate the loan payback period. Students will be paying back the principal amount of $4.2 million over time. After taking into consideration the time value of money, this means that students will pay off a discounted present value of $2.9 million in principal over the 15 years. In order to calculate interest, we only consider interest on the federal loans awarded to students in FY 2021-22. Using the student discount rate of 4.4%[32] as our interest rate, we calculate that students will pay a total discounted present value of $1.2 million in interest on student loans throughout the first 15 years of their working lifetime. The stream of these future interest costs together with the stream of loan payments is included in the costs of Column 5 of Table 3.2.

The steps leading up to the calculation of student costs appear in Table 3.1. Direct outlays amount to $14.3 million, the sum of tuition and fees ($18.3 million) and books and supplies ($942.7 thousand), less federal loans received ($4.2 million) and $665.4 thousand in direct outlays of personal enrichment students (those students are excluded from the cost calculations). Opportunity costs for working and non-working students

30 "American Time Use Survey. 2017-2019. Last modified November 30, 2021. Accessed March 2022. https://www.bls.gov/tus/data.htm.

31 Repayment period based on total education loan indebtedness, U.S. Department of Education, 2022. https://studentaid.ed.gov/sa/repay-loans/understand/plans/standard.

32 The student discount rate is derived from the three-year average of the baseline forecasts for the 10-year discount rate published by the Congressional Budget Office. See the Congressional Budget Office, Student Loan and Pell Grant Programs – May 2022 Baseline. https://www.cbo.gov/data/baseline-projections-selected-programs.

amount to $12.1 million. Residual aid paid directly to students, offsetting costs, amounts to $12.2. million.[33] Finally, we have the present value of future student loan costs, amounting to $4.2 million between principal and interest. Summing direct outlays, opportunity costs, and future student loan costs together yields a total of $18.4 million in present value student costs.

Table 3.1: Present value of student costs, FY 2021-22 (thousands)

Direct outlays in FY 2021-22	
Tuition and fees	$18,259
Less federal loans received	-$4,230
Books and supplies	$943
Less direct outlays of personal enrichment students	-$665
Total direct outlays	**$14,307**
Opportunity costs in FY 2021-22	
Earnings forgone by non-working students	$8,053
Earnings forgone by working students	$3,625
Value of leisure time forgone by working students	$404
Total opportunity costs	**$12,082**
Less residual aid	-$12,175
Total residual aid	**-$12,175**
Future student loan costs (present value)	
Student loan principal	$2,939
Student loan interest	$1,232
Total present value student loan costs	**$4,171**
Total present value student costs	**$18,385**

Source: Based on data provided by NMC and outputs of the Lightcast impact model.

Linking education to earnings

Having estimated the costs of education to students, we weigh these costs against the benefits that students receive in return. The relationship between education and earnings is well documented and forms the basis for determining student benefits. As shown in Table 1.4, state mean earnings levels at the midpoint of the average-aged worker's career increase as people achieve higher levels of education. The differences between state earnings levels define the incremental benefits of moving from one education level to the next.

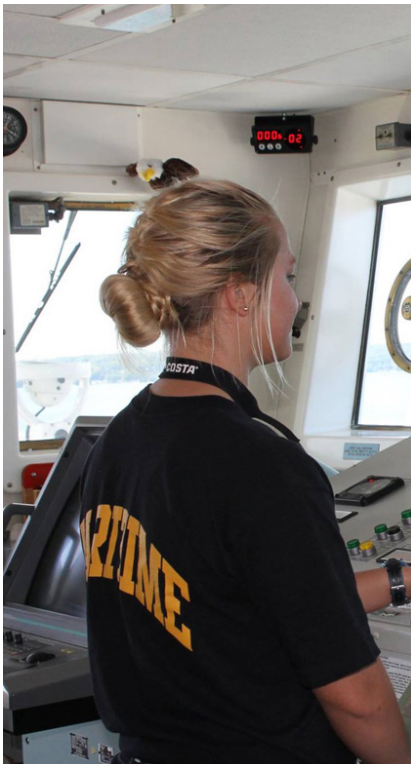
33 Residual aid is the remaining portion of scholarship or grant aid distributed directly to a student after the college applies tuition and fees.

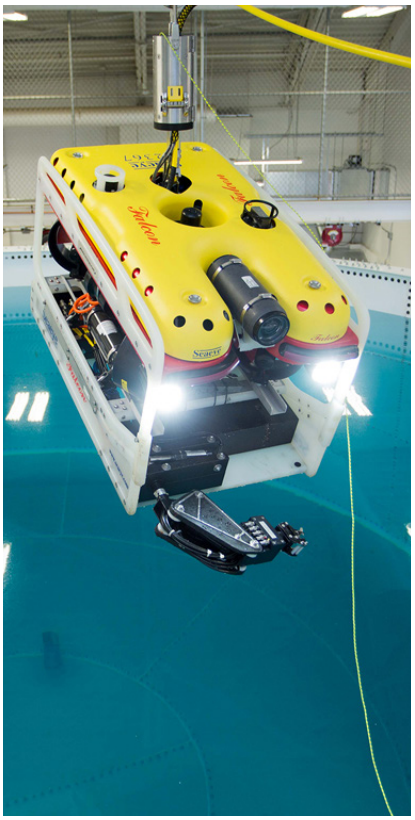
A key component in determining the students' return on investment is the value of their future benefits stream; i.e., what they can expect to earn in return for the investment they make in education. We calculate the future benefits stream to the college's FY 2021-22 students first by determining their average annual increase in earnings, equal to $6.7 million. This value represents the higher wages that accrue to students at the midpoint of their careers and is calculated based on the marginal wage increases of the CHEs that students complete while attending the college. Using the state of Michigan earnings, the marginal wage increase per CHE is $127. For a full description of the methodology used to derive the $6.7 million, see Appendix 6.

The second step is to project the $6.7 million annual increase in earnings into the future, for as long as students remain in the workforce. We do this using the Mincer function to predict the change in earnings at each point in an individual's working career.[34] The Mincer function originated from Mincer's seminal work on human capital (1958). The function estimates earnings using an individual's years of education and post-schooling experience. While some have criticized Mincer's earnings function, it is still upheld in recent data and has served as the foundation for a variety of research pertaining to labor economics. Card (1999 and 2001) addresses a number of these criticisms using U.S. based research over the last three decades and concludes that any upward bias in the Mincer parameters is on the order of 10% or less. We use state-specific and education level-specific Mincer coefficients. To account for any upward bias, we incorporate a 10% reduction in our projected earnings, otherwise known as the ability bias. With the $6.7 million representing the students' higher earnings at the midpoint of their careers, we apply scalars from the Mincer function to yield a stream of projected future benefits that gradually increase from the time students enter the workforce, peak shortly after the career midpoint, and then dampen slightly as students approach retirement at age 67. This earnings stream appears in Column 2 of Table 3.2.

As shown in Table 3.2, the $6.7 million in gross higher earnings occurs around Year 15, which is the approximate midpoint of the students' future working careers given the average age of the student population and an assumed retirement age of 67. In accordance with the Mincer function, the gross higher earnings that accrue to students in the years leading up to the midpoint are less than $6.7 million and the gross higher earnings in the years after the midpoint are greater than $6.7 million.

The final step in calculating the students' future benefits stream is to net out the potential benefits generated by students who are either not yet active in the workforce or who leave the workforce over time. This adjustment appears in Column 3 of Table 3.2 and represents the percentage of the FY 2021-22 student population that will be employed in the workforce in a given year. Note that the percentages in the first five years of the time horizon are relatively lower than those in subsequent years. This is because many students delay their entry into the workforce, either because they are still enrolled at the college or because they are unable to find a job immediately upon graduation. Accordingly, we apply a set of "settling-in" factors to account for the time needed by students to find employment and settle into their careers. As discussed





34 Appendix 6 provides more information on the Mincer function and how it is used to predict future earnings growth.

Table 3.2: **Projected benefits and costs, student perspective**

1	2	3	4	5	6
Year	Gross higher earnings to students (millions)	% active in workforce*	Net higher earnings to students (millions)	Student costs (millions)	Net cash flow (millions)
0	$3.4	10%	$0.4	$14.2	-$13.9
1	$3.6	17%	$0.6	$0.4	$0.2
2	$3.9	25%	$1.0	$0.4	$0.6
3	$4.1	40%	$1.6	$0.4	$1.2
4	$4.3	61%	$2.6	$0.4	$2.2
5	$4.5	96%	$4.4	$0.4	$4.0
6	$4.8	96%	$4.6	$0.4	$4.2
7	$5.0	96%	$4.8	$0.4	$4.4
8	$5.2	96%	$5.0	$0.4	$4.6
9	$5.4	96%	$5.2	$0.4	$4.8
10	$5.7	95%	$5.4	$0.4	$5.0
11	$5.9	95%	$5.6	$0.4	$5.2
12	$6.1	95%	$5.8	$0.4	$5.4
13	$6.3	95%	$6.0	$0.4	$5.6
14	$6.5	95%	$6.1	$0.4	$5.7
15	$6.7	94%	$6.3	$0.4	$5.9
16	$6.8	94%	$6.4	$0.0	$6.4
17	$7.0	94%	$6.6	$0.0	$6.6
18	$7.1	94%	$6.7	$0.0	$6.7
19	$7.3	93%	$6.8	$0.0	$6.8
20	$7.4	93%	$6.9	$0.0	$6.9
21	$7.5	93%	$6.9	$0.0	$6.9
22	$7.6	92%	$7.0	$0.0	$7.0
23	$7.6	92%	$7.0	$0.0	$7.0
24	$7.7	92%	$7.1	$0.0	$7.1
25	$7.7	91%	$7.0	$0.0	$7.0
26	$7.7	91%	$7.0	$0.0	$7.0
27	$7.7	90%	$7.0	$0.0	$7.0
28	$7.7	90%	$6.9	$0.0	$6.9
29	$7.7	89%	$6.8	$0.0	$6.8
30	$7.6	88%	$6.7	$0.0	$6.7
31	$7.6	88%	$6.6	$0.0	$6.6
32	$7.5	87%	$6.5	$0.0	$6.5
33	$7.4	86%	$6.3	$0.0	$6.3
34	$7.2	85%	$6.2	$0.0	$6.2
35	$7.1	84%	$6.0	$0.0	$6.0
36	$7.0	83%	$5.8	$0.0	$5.8
37	$6.8	82%	$5.6	$0.0	$5.6
38	$6.6	81%	$5.4	$0.0	$5.4
39	$6.4	80%	$5.1	$0.0	$5.1
40	$6.3	78%	$4.9	$0.0	$4.9
Present value			**$95.0**	**$18.4**	**$76.6**

* Includes the "settling-in" factors and attrition.

Source: Lightcast impact model.

Benefit-cost ratio	Internal rate of return	Payback period (years)
5.2	20.3%	6.3

in Chapter 2, settling-in factors delay the onset of the benefits by one to three years for students who graduate with a certificate or a degree and by one to five years for degree-seeking students who do not complete during the analysis year.

Beyond the first five years of the time horizon, students will leave the workforce for any number of reasons, whether death, retirement, or unemployment. We estimate the rate of attrition using the same data and assumptions applied in the calculation of the attrition rate in the economic impact analysis of Chapter 2.[35] The likelihood of leaving the workforce increases as students age, so the attrition rate is more aggressive near the end of the time horizon than in the beginning. Column 4 of Table 3.2 shows the net higher earnings to students after accounting for both the settling-in patterns and attrition.

Return on investment for students

Having estimated the students' costs and their future benefits stream, the next step is to discount the results to the present to reflect the time value of money. For the student perspective we assume a discount rate of 4.4% (see below). Because students tend to rely upon debt to pay for education – i.e. they are negative savers – their discount rate is based upon student loan interest rates.[36] In Appendix 1, we conduct a sensitivity analysis of this discount rate. The present value of the benefits is then compared to student costs to derive the investment analysis results, expressed in terms of a benefit-cost ratio, rate of return, and payback period. The investment is feasible if returns match or exceed the minimum threshold values; i.e., a benefit-cost ratio greater than 1.0, a rate of return that exceeds the discount rate, and a reasonably short payback period.

Discount rate

The discount rate is a rate of interest that converts future costs and benefits to present values. For example, $1,000 in higher earnings realized 30 years in the future is worth much less than $1,000 in the present. All future values must therefore be expressed in present value terms in order to compare them with investments (i.e., costs) made today. The selection of an appropriate discount rate, however, can become an arbitrary and controversial undertaking. As suggested in economic theory, the discount rate should reflect the investor's opportunity cost of capital, i.e., the rate of return one could reasonably expect to obtain from alternative investment schemes. In this study we assume a 4.4% discount rate from the student perspective and a 0.2% discount rate from the perspectives of taxpayers and society.

In Table 3.2, the net higher earnings of students yield a cumulative discounted sum of approximately $95.0 million, the present value of all of the future earnings increments (see the bottom section of Column 4). This may also be interpreted as the gross

35 See the discussion of the alumni impact in Chapter 2. The main sources for deriving the attrition rate are the National Center for Health Statistics, the Social Security Administration, and the Bureau of Labor Statistics. Note that we do not account for migration patterns in the student investment analysis because the higher earnings that students receive as a result of their education will accrue to them regardless of where they find employment.

36 The student discount rate is derived from the most recent three-year average baseline forecasts for the 10-year Treasury rate published by the Congressional Budget Office. See the Congressional Budget Office, Student Loan and Pell Grant Programs – May 2022 Baseline. https://www.cbo.gov/data/baseline-projections-selected-programs.

capital asset value of the students' higher earnings stream. In effect, the aggregate FY 2021-22 student body is rewarded for its investment in NMC with a capital asset valued at $95.0 million.

The students' cost of attending the college is shown in Column 5 of Table 3.2, equal to a present value of $18.4 million. Comparing the cost with the present value of benefits yields a student benefit-cost ratio of 5.2 (equal to $95.0 million in benefits divided by $18.4 million in costs).

Another way to compare the same benefits stream and associated cost is to compute the rate of return. The rate of return indicates the interest rate that a bank would have to pay a depositor to yield an equally attractive stream of future payments.[37] Table 3.2 shows students of NMC earning average returns of 20.3% on their investment of time and money. This is a favorable return compared, for example, to approximately 1% on a standard bank savings account, or 9.6% on stocks and bonds (30-year average return).

NMC students see an average rate of return of **20.3%** for their investment of time and money.

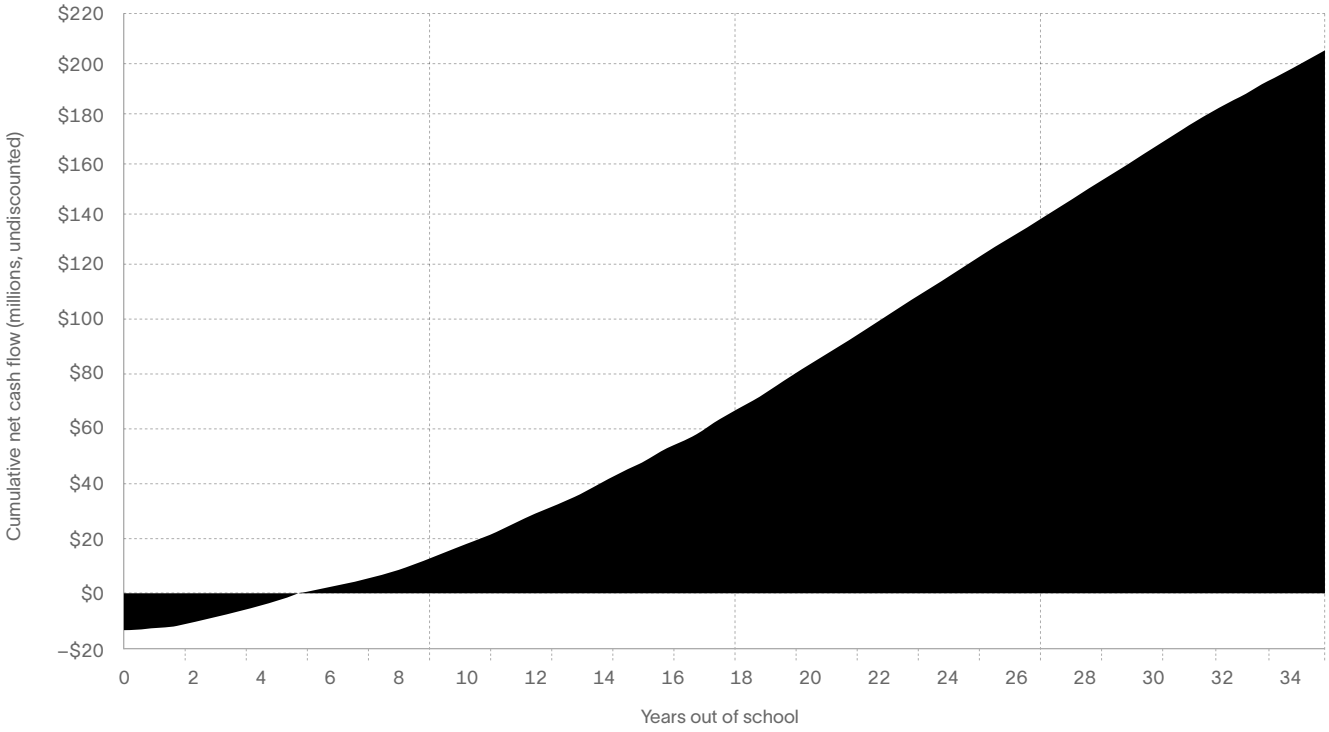
Note that returns reported in this study are real returns, not nominal. When a bank promises to pay a certain rate of interest on a savings account, it employs an implicitly nominal rate. Bonds operate in a similar manner. If it turns out that the inflation rate is higher than the stated rate of return, then money is lost in real terms. In contrast, a real rate of return is on top of inflation. For example, if inflation is running at 3% and a nominal percentage of 5% is paid, then the real rate of return on the investment is only 2%. In Table 3.2, the 20.3% student rate of return is a real rate. With an inflation rate of 2.5% (the average rate reported over the past 20 years as per the U.S. Department of Commerce, Consumer Price Index), the corresponding nominal rate of return is 22.8%, higher than what is reported in Table 3.2.

The payback period is defined as the length of time it takes to entirely recoup the initial investment.[38] Beyond that point, returns are what economists would call pure costless rent. As indicated in Table 3.2, students at NMC see, on average, a payback period of 6.3 years, meaning 6.3 years after their initial investment of forgone earnings and out-of-pocket costs, they will have received enough higher future earnings to fully recover those costs (Figure 3.1).

37 Rates of return are computed using the familiar internal rate-of-return calculation. Note that, with a bank deposit or stock market investment, the depositor puts up a principal, receives in return a stream of periodic payments, and then recovers the principal at the end. Someone who invests in education, on the other hand, receives a stream of periodic payments that include the recovery of the principal as part of the periodic payments, but there is no principal recovery at the end. These differences notwithstanding comparable cash flows for both bank and education investors yield the same internal rate of return.

38 Payback analysis is generally used by the business community to rank alternative investments when safety of investments is an issue. Its greatest drawback is it does not account for the time value of money. The payback period is calculated by dividing the cost of the investment by the net return per period. In this study, the cost of the investment includes tuition and fees plus the opportunity cost of time; it does not account for student living expenses.

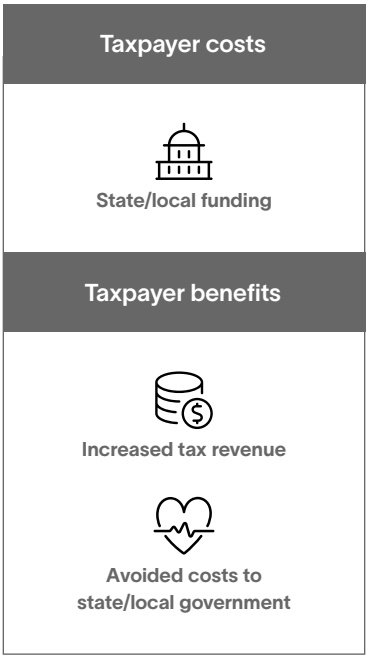
Figure 3.1: Student payback period



Source: Lightcast impact model.

Taxpayer perspective

From the taxpayer perspective, the pivotal step is to determine the public benefits that specifically accrue to state and local government. For example, benefits resulting from earnings growth are limited to increased state and local tax payments. Similarly, savings related to improved health, reduced crime, and fewer welfare and unemployment claims, discussed below, are limited to those received strictly by state and local government. In all instances, benefits to private residents, local businesses, or the federal government are excluded.



Growth in state tax revenues

As a result of their time at NMC, students earn more because of the skills they learned while attending the college, and businesses earn more because student skills make capital more productive (buildings, machinery, and everything else). This in turn raises profits and other business property income. Together, increases in labor and non-labor (i.e., capital) income are considered the effect of a skilled workforce. These in turn increase tax revenues since state and local government is able to apply tax rates to higher earnings.

Estimating the effect of NMC on increased tax revenues begins with the present value of the students' future earnings stream, which is displayed in Column 4 of Table 3.2. To these net higher earnings, we apply a multiplier derived from Lightcast's MR-SAM model to estimate the added labor income created in the state as students and businesses spend their higher earnings.[39] As labor income increases, so does non-labor income, which consists of monies gained through investments. To calculate the growth in non-labor income, we multiply the increase in labor income by a ratio of the Michigan gross state product to total labor income in the state. We also include the spending impacts discussed in Chapter 2 that were created in FY 2021-22 from operations and student spending, measured at the state level. To each of these, we apply the prevailing tax rates so we capture only the tax revenues attributable to state and local government from this additional revenue.

39 For a full description of the Lightcast MR-SAM model, see Appendix 5.

Not all of these tax revenues may be counted as benefits to the state, however. Some students leave the state during the course of their careers, and the higher earnings they receive as a result of their education leave the state with them. To account for this dynamic, we combine student settlement data from the college with data on migration patterns from the Internal Revenue Service to estimate the number of students who will leave the state workforce over time.

We apply another reduction factor to account for the students' alternative education opportunities. This is the same adjustment that we use in the calculation of the alumni impact in Chapter 2 and is designed to account for the counterfactual scenario where NMC does not exist. The assumption in this case is that any benefits generated by students who could have received an education even without the college cannot be counted as new benefits to society. For this analysis, we assume an alternative education variable of 15%, meaning that 15% of the student population at the college would have generated benefits anyway even without the college. For more information on the alternative education variable, see Appendix 7.

We apply a final adjustment factor to account for the "shutdown point" that nets out benefits that are not directly linked to the state and local government costs of supporting the college. As with the alternative education variable discussed under the alumni impact, the purpose of this adjustment is to account for counterfactual scenarios. In this case, the counterfactual scenario is where state and local government funding for NMC did not exist and NMC had to derive the revenue elsewhere. To estimate this shutdown point, we apply a sub-model that simulates the students' demand curve for education by reducing state and local support to zero and progressively increasing student tuition and fees. As student tuition and fees increase, enrollment declines. For NMC, the shutdown point adjustment is 0%, meaning that the college could not operate without taxpayer support. As such, no reduction applies. For more information on the theory and methodology behind the estimation of the shutdown point, see Appendix 9.

After adjusting for attrition, alternative education opportunities, and the shutdown point, we calculate the present value of the future added tax revenues that occur in the state, equal to $32.8 million. Recall from the discussion of the student return on investment that the present value represents the sum of the future benefits that accrue each year over the course of the time horizon, discounted to current year dollars to account for the time value of money. Given that the stakeholder in this case is the public sector, we use the discount rate of 0.2%. This is the three-year average of the real Treasury interest rate reported by the Office of Management and Budget (OMB) for 30-year investments, and in Appendix 1, we conduct a sensitivity analysis of this discount rate.[40]

40 Office of Management and Budget. "Discount Rates for Cost-Effectiveness, Lease Purchase, and Related Analyses." Real Interest Rates on Treasury Notes and Bonds of Specified Maturities (in Percent). https://www.whitehouse.gov/wp-content/uploads/2022/06/M-22-13-Discount-Rates.pdf. Last revised March 15, 2022.

Government savings

In addition to the creation of higher tax revenues to the state and local government, education is statistically associated with a variety of lifestyle changes that generate social savings, also known as external or incidental benefits of education. These represent the avoided costs to the government that otherwise would have been drawn from public resources absent the education provided by NMC. Government savings appear in Figure 3.2 and Table 3.3 and break down into three main categories: 1) health savings, 2) crime savings, and 3) income assistance savings. Health savings include avoided medical costs that would have otherwise been covered by state and local government. Crime savings consist of avoided costs to the justice system (i.e., police protection, judicial and legal, and corrections). Income assistance benefits comprise avoided costs due to the reduced number of welfare and unemployment insurance claims.

In addition to the creation of **higher tax revenues** to the state and local government, education is statistically associated with a variety of lifestyle changes that generate **social savings**.

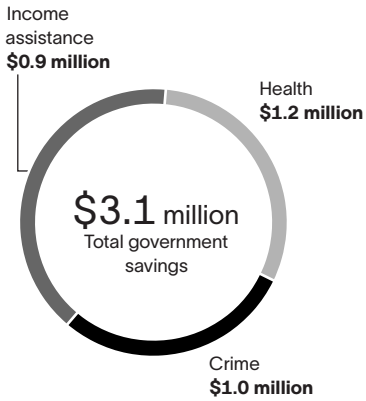
The model quantifies government savings by calculating the probability at each education level that individuals will have poor health, commit crimes, or claim welfare and unemployment benefits. Deriving the probabilities involves assembling data from a variety of studies and surveys analyzing the correlation between education and health, crime, and income assistance at the national and state level. We spread the probabilities across the education ladder and multiply the marginal differences by the number of students who achieved CHEs at each step. The sum of these marginal differences counts as the upper bound measure of the number of students who, due to the education they received at the college, will not have poor health, commit crimes, or demand income assistance. We dampen these results by the ability bias adjustment discussed earlier in the student perspective section and in Appendix 6 to account for factors (besides education) that influence individual behavior. We then multiply the marginal effects of education times the associated costs of health, crime, and income assistance.[41] Finally, we apply the same adjustments for attrition, alternative education,

Table 3.3: Present value of added tax revenue and government savings (thousands)

Added tax revenue	**$32,842**
Government savings	
Health-related savings	$1,178
Crime-related savings	$1,047
Income assistance savings	$876
Total government savings	**$3,101**
Total taxpayer benefits	**$35,943**

Source: Lightcast impact model.

Figure 3.2: Present value of government savings



Source: Lightcast impact model.

41 For a full list of the data sources used to calculate the social externalities, see the Resources and References section. See also Appendix 10 for a more in-depth description of the methodology.

and the shutdown point to derive the net savings to the government. Total government savings appear in Figure 3.2 and sum to $3.1 million.

Table 3.3 displays all benefits to taxpayers. The first row shows the added tax revenues created in the state, equal to $32.8 million, from students' higher earnings, increases in non-labor income, and spending impacts. The sum of the government savings and the added income in the state is $35.9 million, as shown in the bottom row of Table 3.3. These savings continue to accrue in the future as long as the FY 2021-22 student population of NMC remains in the workforce.

Return on investment for taxpayers

Taxpayer costs are reported in Table 3.4 and come to $25.8 million, equal to the contribution of state and local government to NMC. In return for their public support, taxpayers will receive an investment benefit-cost ratio of 1.4 (= $35.9 million ÷ $25.8 million), indicating a profitable investment.

At 2.1%, the rate of return to state and local taxpayers is favorable. Given that the stakeholder in this case is the public sector, we use the mentioned earlier discount rate of 0.2%, the three-year average of the real Treasury interest rate reported by the Office of Management and Budget for 30-year investments. This is the return governments are assumed to be able to earn on generally safe investments of unused funds, or alternatively, the interest rate for which governments, as relatively safe borrowers, can obtain funds. A rate of return of 0.2% would mean that the college just pays its own way. In principle, governments could borrow monies used to support NMC and repay the loans out of the resulting added taxes and reduced government expenditures. A rate of return of 2.1%, on the other hand, means that NMC not only pays its own way, but also generates a surplus that the state and local government can use to fund other programs.

Additionally, a benefit-cost ratio greater than 1.0 indicates a good public investment since the taxes from NMC student higher earnings and reduced government expenditures not only recover taxpayer costs but grow the Michigan tax base.

A benefit-cost ratio of **1.4** means NMC is a good public investment since the taxes from NMC student higher earnings and reduced government expenditures not only recover taxpayer costs but grow the Michigan tax base.

Table 3.4: **Projected benefits and costs, taxpayer perspective**

1	2	3	4
Year	Benefits to taxpayers (millions)	State & local government costs (millions)	Net cash flow (millions)
0	$3.4	$25.8	-$22.4
1	$0.1	$0.0	$0.1
2	$0.2	$0.0	$0.2
3	$0.3	$0.0	$0.3
4	$0.5	$0.0	$0.5
5	$0.8	$0.0	$0.8
6	$0.8	$0.0	$0.8
7	$0.9	$0.0	$0.9
8	$0.9	$0.0	$0.9
9	$0.9	$0.0	$0.9
10	$0.9	$0.0	$0.9
11	$0.9	$0.0	$0.9
12	$0.9	$0.0	$0.9
13	$1.0	$0.0	$1.0
14	$1.0	$0.0	$1.0
15	$1.0	$0.0	$1.0
16	$1.0	$0.0	$1.0
17	$1.0	$0.0	$1.0
18	$1.0	$0.0	$1.0
19	$1.0	$0.0	$1.0
20	$1.0	$0.0	$1.0
21	$1.0	$0.0	$1.0
22	$1.0	$0.0	$1.0
23	$1.0	$0.0	$1.0
24	$1.0	$0.0	$1.0
25	$1.0	$0.0	$1.0
26	$1.0	$0.0	$1.0
27	$1.0	$0.0	$1.0
28	$1.0	$0.0	$1.0
29	$1.0	$0.0	$1.0
30	$0.9	$0.0	$0.9
31	$0.9	$0.0	$0.9
32	$0.9	$0.0	$0.9
33	$0.9	$0.0	$0.9
34	$0.8	$0.0	$0.8
35	$0.8	$0.0	$0.8
36	$0.8	$0.0	$0.8
37	$0.8	$0.0	$0.8
38	$0.7	$0.0	$0.7
39	$0.7	$0.0	$0.7
40	$0.7	$0.0	$0.7
Present value	**$35.9**	**$25.8**	**$10.2**

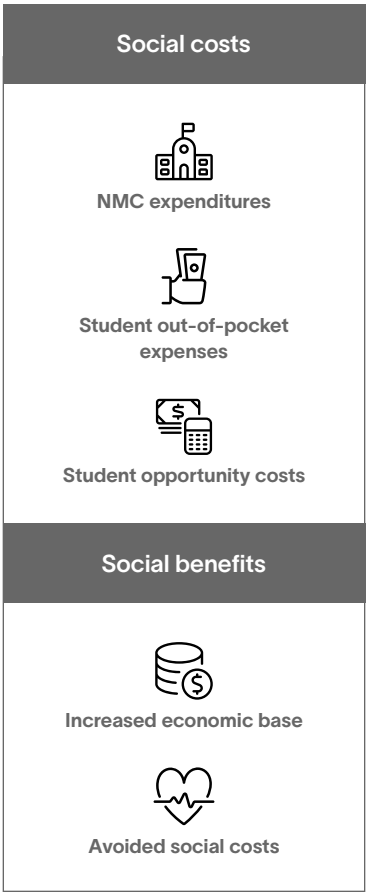
Source: Lightcast impact model.

Benefit-cost ratio	Internal rate of return	Payback period (years)
1.4	2.1%	26.2

Social perspective

Michigan benefits from the education that NMC provides through the earnings that students create in the state and through the savings that they generate through their improved lifestyles. To receive these benefits, however, members of society must pay money and forgo services that they otherwise would have enjoyed if NMC did not exist. Society's investment in NMC stretches across a number of investor groups, from students to employers to taxpayers. We weigh the benefits generated by NMC to these investor groups against the total social costs of generating those benefits. The total social costs include all NMC expenditures, all student expenditures (including interest on student loans) less tuition and fees, and all student opportunity costs, totaling a present value of $55.9 million.

On the benefits side, any benefits that accrue to Michigan as a whole – including students, employers, taxpayers, and anyone else who stands to benefit from the activities of NMC – are counted as benefits under the social perspective. We group these benefits under the following broad headings: 1) increased earnings in the state, and 2) social externalities stemming from improved health, reduced crime, and reduced unemployment in the state (see the Beekeeper Analogy box for a discussion of externalities). Both of these benefits components are described more fully in the following sections.



Growth in state economic base

In the process of absorbing the newly acquired skills of students who attend NMC, not only does the productivity of the Michigan workforce increase, but so does the productivity of its physical capital and assorted infrastructure. Students earn more because of the skills they learned while attending the college, and businesses earn more because student skills make capital more productive (buildings, machinery, and everything else). This in turn raises profits and other business property income. Together, increases in labor and non-labor (i.e., capital) income are considered the effect of a skilled workforce.

Estimating the effect of NMC on the state's economic base follows a similar process used when calculating increased tax revenues in the taxpayer perspective. However, instead of looking at just the tax revenue portion, we include all of the added earnings

Beekeeper analogy

Beekeepers provide a classic example of positive externalities (sometimes called "neighborhood effects"). The beekeeper's intention is to make money selling honey. Like any other business, receipts must at least cover operating costs. If they don't, the business shuts down.

But from society's standpoint, there is more. Flowers provide the nectar that bees need for honey production, and smart beekeepers locate near flowering sources such as orchards. Nearby orchard owners, in turn, benefit as the bees spread the pollen necessary for orchard growth and fruit production. This is an uncompensated external benefit of beekeeping, and economists have long recognized that society might actually do well to subsidize activities that produce positive externalities, such as beekeeping.

Educational institutions are like beekeepers. While their principal aim is to provide education and raise people's earnings, in the process they create an array of external benefits. Students' health and lifestyles are improved, and society indirectly benefits just as orchard owners indirectly benefit from beekeepers. In an effort to provide a more comprehensive report of the benefits generated by education, the model accounts for many of these external social benefits.

and business output. First, we calculate the students' future higher earnings stream. We factor in student attrition and alternative education opportunities to arrive at net higher earnings. We again apply multipliers derived from Lightcast's MR-SAM model to estimate the added labor and non-labor income created in the state as students and businesses spend their higher earnings and as businesses generate additional profits from this increased output (added student and business income in Figure 3.3). We also include the operations and student spending impacts discussed in Chapter 2 that were created in FY 2021-22, measured at the state level (added income from college activities in Figure 3.3.). The shutdown point does not apply to the growth of the economic base because the social perspective captures not only the state and local taxpayer support to the college, but also the support from the students and other non-government sources.

Using this process, we calculate the present value of the future added income that occurs in the state, equal to $402.1 million. Recall from the discussion of the student and taxpayer return on investment that the present value represents the sum of the future benefits that accrue each year over the course of the time horizon, discounted to current year dollars to account for the time value of money. As stated in the taxpayer perspective, given that the stakeholder in this case is the public sector, we use the discount rate of 0.2%.

Social savings

Similar to the government savings discussed above, society as a whole sees savings due to external or incidental benefits of education. These represent the avoided costs that otherwise would have been drawn from private and public resources absent the education provided by NMC. Social benefits appear in Table 3.5 and break down into three main categories: 1) health savings, 2) crime savings, and 3) income assistance savings. These are similar to the categories from the taxpayer perspective above, although health savings now also include lost productivity and other effects associated with smoking, alcohol dependence, obesity, depression, and drug abuse. In addition

to avoided costs to the justice system, crime savings also consist of avoided victim costs and benefits stemming from the added productivity of individuals who otherwise would have been incarcerated. Income assistance savings are comprised of the avoided government costs due to the reduced number of welfare and unemployment insurance claims.

Table 3.5 displays the results of the analysis. The first row shows the increased economic base in the state, equal to $402.1 million, from students' higher earnings and their multiplier effects, increases in non-labor income, and spending impacts. Social savings appear next, beginning with a breakdown of savings related to health. These include savings due to a reduced demand for medical treatment and social services, improved worker productivity and reduced absenteeism, and a reduced number of vehicle crashes and fires induced by alcohol or smoking-related incidents. Although the prevalence of these health conditions generally declines as individuals attain higher levels of education, prevalence rates are sometimes higher for individuals with certain levels of education. For example, adults with college degrees may be more likely to spend more on alcohol and become dependent on alcohol. Thus, in some cases the social savings associated with a health factor can be negative. Nevertheless, the overall health savings for society are positive, amounting to $7.8 million. Crime savings amount to $1.2 million, including savings associated with a reduced number of crime victims, added worker productivity, and reduced expenditures for police and law enforcement,

Table 3.5: Present value of the future increased economic base and social savings in the state (thousands)

Increased economic base	**$402,053**
Social savings	
Health	
Smoking	$8,691
Alcohol dependence	-$1,295
Obesity	$2,557
Depression	-$2,209
Drug abuse	$15
Total health savings*	**$7,760**
Crime	
Criminal justice system savings	$1,036
Crime victim savings	$27
Added productivity	$110
Total crime savings	**$1,173**
Income assistance	
Welfare savings	$671
Unemployment savings	$205
Total income assistance savings	**$876**
Total social savings	**$9,808**
Total, increased economic base + social savings	**$411,861**

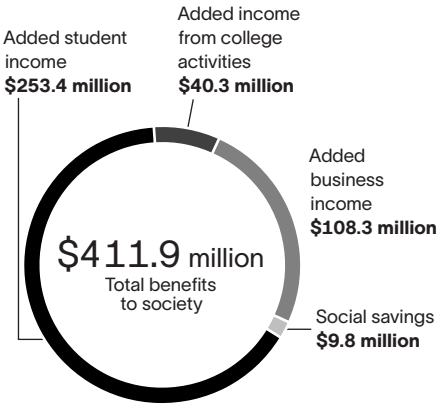
* In some cases, health savings may be negative. This is due to increased prevalence rates at certain education levels.

Source: Lightcast impact model.

courts and administration of justice, and corrective services. Finally, the present value of the savings related to income assistance amounts to $875.6 thousand, stemming from a reduced number of persons in need of welfare or unemployment benefits. All told, social savings amounted to $9.8 million in benefits to communities and citizens in Michigan.

The sum of the social savings and the increased state economic base is $411.9 million, as shown in the bottom row of Table 3.5 and in Figure 3.3. These savings accrue in the future as long as the FY 2021-22 student population of NMC remains in the workforce.

Figure 3.3: Present value of benefits to society



Source: Lightcast impact model.

Return on investment for society

Table 3.6 presents the stream of benefits accruing to the Michigan society and the total social costs of generating those benefits. Comparing the present value of the benefits and the social costs, we have a benefit-cost ratio of 7.4. This means that for every dollar invested in an education from NMC, whether it is the money spent on operations of the college or money spent by students on tuition and fees, an average of $7.40 in benefits will accrue to society in Michigan.[42]

With and without social savings

Earlier in this chapter, social benefits attributable to education (improved health, reduced crime, and reduced demand for income assistance) were defined as externalities that are incidental to the operations of NMC. Some would question the legitimacy of including these benefits in the calculation of rates of return to education, arguing that only the tangible benefits (higher earnings) should be counted. Table 3.4 and Table 3.6 are inclusive of social benefits reported as attributable to NMC. Recognizing the other point of view, Table 3.7 shows rates of return for both the taxpayer and social perspectives exclusive of social benefits. As indicated, returns are still above threshold levels (a net present value greater than zero and a benefit-cost ratio greater than 1.0), confirming that taxpayers and society as a whole receive value from investing in NMC.

Table 3.7: Social perspectives with and without social savings

	Including social savings	Excluding social savings
Taxpayer perspective		
Net present value (millions)	$10.2	$7.1
Benefit-cost ratio	1.4	1.3
Internal rate of return	2.1%	1.5%
Payback period (no. of years)	26.2	29.7
Social perspective		
Net present value (millions)	$356.0	$346.2
Benefit-cost ratio	7.4	7.2

Source: Lightcast impact model.

42 The rate of return is not reported for the social perspective because the beneficiaries of the investment are not necessarily the same as the original investors.

Table 3.6: **Projected benefits and costs, social perspective**

1	2	3	4
Year	Benefits to society (millions)	Social costs (millions)	Net cash flow (millions)
0	$41.2	$50.2	-$9.0
1	$1.3	$0.4	$0.9
2	$2.0	$0.4	$1.6
3	$3.4	$0.4	$3.0
4	$5.4	$0.4	$5.0
5	$8.9	$0.4	$8.5
6	$9.2	$0.4	$8.8
7	$9.5	$0.4	$9.1
8	$9.7	$0.4	$9.4
9	$10.0	$0.4	$9.6
10	$10.3	$0.4	$9.9
11	$10.5	$0.4	$10.1
12	$10.7	$0.4	$10.3
13	$10.9	$0.4	$10.5
14	$11.1	$0.4	$10.7
15	$11.3	$0.4	$10.9
16	$11.4	$0.0	$11.4
17	$11.5	$0.0	$11.5
18	$11.6	$0.0	$11.6
19	$11.7	$0.0	$11.7
20	$11.8	$0.0	$11.8
21	$11.8	$0.0	$11.8
22	$11.8	$0.0	$11.8
23	$11.7	$0.0	$11.7
24	$11.7	$0.0	$11.7
25	$11.6	$0.0	$11.6
26	$11.5	$0.0	$11.5
27	$11.3	$0.0	$11.3
28	$11.2	$0.0	$11.2
29	$11.0	$0.0	$11.0
30	$10.7	$0.0	$10.7
31	$10.5	$0.0	$10.5
32	$10.2	$0.0	$10.2
33	$9.9	$0.0	$9.9
34	$9.6	$0.0	$9.6
35	$9.3	$0.0	$9.3
36	$8.9	$0.0	$8.9
37	$8.6	$0.0	$8.6
38	$8.2	$0.0	$8.2
39	$7.8	$0.0	$7.8
40	$7.4	$0.0	$7.4
Present value	**$411.9**	**$55.9**	**$356.0**

Source: Lightcast impact model.

Benefit-cost ratio

7.4

Payback period (years)

3.7

Chapter 4:

Conclusion

WHILE NMC'S VALUE to the NMC Service Area is larger than simply its economic impact, understanding the dollars and cents value is an important asset to understanding the college's value as a whole. In order to fully assess NMC's value to the regional economy, this report has evaluated the college from the perspectives of economic impact analysis and investment analysis.

From an economic impact perspective, we calculated that NMC generates a total economic impact of **$204.5 million** in total added income for the regional economy. This represents the sum of several different impacts, including the college's:

- Operations spending impact (**$37.4 million**);
- Student spending impact (**$3.2 million**); and
- Alumni impact (**$163.9 million**).

The total impact of $204.5 million is equivalent to approximately **2.0%** of the total GRP of the NMC Service Area and is equivalent to supporting **3,106 jobs**. For perspective, this means that **one out of every 42 jobs** in the NMC Service Area is supported by the activities of NMC and its students.

One out of every 42 jobs in the NMC Service Area is supported by the activities of NMC and its students.

Since NMC's activity represents an investment by various parties, including students, taxpayers, and society as a whole, we also evaluated the college as an investment to see the value it provides to these investors. For each dollar invested by students, taxpayers, and society, NMC offers a benefit of **$5.20**, **$1.40**, and **$7.40**, respectively. These results indicate that NMC is an attractive investment to students with rates of return that exceed alternative investment opportunities. At the same time, the presence of the college expands the state economy and creates a wide range of positive social benefits that accrue to taxpayers and society in general within Michigan.

Modeling the impact of the college is subject to many factors, the variability of which we considered in our sensitivity analysis (Appendix 1). With this variability accounted for, we present the findings of this study as a robust picture of the economic value of NMC.

Lightcast

Lightcast provides colleges and universities with labor market data that help create better outcomes for students, businesses, and communities. Our data, which cover more than 99% of the U.S. workforce, are compiled from a wide variety of government sources, job postings, and online profiles and résumés. Hundreds of institutions use Lightcast to align programs with regional needs, drive enrollment, connect students with in-demand careers, track their alumni's employment outcomes, and demonstrate their institution's economic impact on their region. Visit lightcast.io/solutions/education to learn more or connect with us.

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Appendix 1: Sensitivity analysis

Sensitivity analysis measures the extent to which a model's outputs are affected by hypothetical changes in the background data and assumptions. This is especially important when those variables are inherently uncertain. This analysis allows us to identify a plausible range of potential results that would occur if the value of any of the variables is in fact different from what was expected. In this chapter we test the sensitivity of the model to the following input factors: 1) the alternative education variable, 2) the labor import effect variable, 3) the student employment variables, 4) the discount rate, and 5) the retained student variable.

Alternative education variable

The alternative education variable (15%) accounts for the counterfactual scenario where students would have to seek a similar education elsewhere absent the publicly-funded college in the region. Given the difficulty in accurately specifying the alternative education variable, we test the sensitivity of the taxpayer and social investment analysis results to its magnitude. Variations in the alternative education assumption are calculated around base case results listed in the middle column of Table A1.1. Next, the model brackets the base case assumption on either side with a plus or minus 10%, 25%, and 50% variation in assumptions. Analyses are then repeated introducing one change at a time, holding all other variables constant. For example, an increase of 10% in the alternative education assumption (from 15% to 17%) reduces the taxpayer perspective rate of return from 2.1% to 2.0%. Likewise, a decrease of 10% (from 15% to 14%) in the assumption increases the rate of return from 2.1% to 2.2%.

Table A1.1: Sensitivity analysis of alternative education variable, taxpayer and social perspectives

% variation in assumption	-50%	-25%	-10%	Base case	10%	25%	50%
Alternative education variable	**8%**	**11%**	**14%**	**15%**	**17%**	**19%**	**23%**
Taxpayer perspective							
Net present value (millions)	$13.3	$11.7	$10.8	$10.2	$9.5	$8.6	$7.0
Rate of return	2.6%	2.3%	2.2%	2.1%	2.0%	1.8%	1.5%
Benefit-cost ratio	1.52	1.46	1.42	1.39	1.37	1.33	1.27
Social perspective							
Net present value (millions)	$392	$374	$363	$356	$349	$338	$320
Benefit-cost ratio	8.0	7.7	7.5	7.4	7.2	7.0	6.7

Based on this sensitivity analysis, the conclusion can be drawn that NMC investment analysis results from the taxpayer and social perspectives are not very sensitive to relatively large variations in the alternative education variable. As indicated, results are

still above threshold levels (a net present value greater than zero and a benefit-cost ratio greater than 1.0), even when the alternative education assumption is increased by as much as 50% (from 15% to 23%). The conclusion is that although the assumption is difficult to specify, its impact on overall investment analysis results for the taxpayer and social perspectives is not very sensitive.

Labor import effect variable

The labor import effect variable only affects the alumni impact calculation in Table 2.6. In the model we assume a labor import effect variable of 50%, which means that 50% of the region's labor demands would have been satisfied without the presence of NMC. In other words, businesses that hired NMC students could have substituted some of these workers with equally-qualified people from outside the region had there been no NMC students to hire. Therefore, we attribute only the remaining 50% of the initial labor income generated by increased alumni productivity to the college.

Table A1.2 presents the results of the sensitivity analysis for the labor import effect variable. As explained earlier, the assumption increases and decreases relative to the base case of 50% by the increments indicated in the table. Alumni productivity impacts attributable to NMC, for example, range from a high of $245.9 million at a -50% variation to a low of $82 million at a +50% variation from the base case assumption. This means that if the labor import effect variable increases, the impact that we claim as attributable to alumni decreases. Even under the most conservative assumptions, the alumni impact on the NMC Service Area economy still remains sizeable.

Table A1.2: Sensitivity analysis of labor import effect variable

% variation in assumption	-50%	-25%	-10%	Base case	10%	25%	50%
Labor import effect variable	25%	38%	45%	50%	55%	63%	75%
Alumni impact (millions)	$246	$205	$180	$164	$148	$123	$82

Student employment variables

Student employment variables are difficult to estimate because many students do not report their employment status or because colleges generally do not collect this kind of information. Employment variables include the following: 1) the percentage of students who are employed while attending the college and 2) the percentage of earnings that working students receive relative to the earnings they would have received had they not chosen to attend the college. Both employment variables affect the investment analysis results from the student perspective.

Students incur substantial expense by attending NMC because of the time they spend not gainfully employed. Some of that cost is recaptured if students remain partially (or fully) employed while attending. It is estimated that 73% of students are employed.[43] This variable is tested in the sensitivity analysis by changing it first to 100% and then to 0%.

43 Based on data provided by NMC. This figure excludes dual credit high school students, who are not included in the opportunity cost calculations.

The second student employment variable is more difficult to estimate. In this study we estimate that students who are working while attending the college earn only 83%, on average, of the earnings that they statistically would have received if not attending NMC. This suggests that many students hold part-time jobs that accommodate their NMC attendance, though it is at an additional cost in terms of receiving a wage that is less than what they otherwise might make. The 83% variable is an estimation based on the average hourly wages of the most common jobs held by students while attending college relative to the average hourly wages of all occupations in the NMC Service Area. The model captures this difference in wages and counts it as part of the opportunity cost of time. As above, the 83% estimate is tested in the sensitivity analysis by changing it to 100% and then to 0%.

The changes generate results summarized in Table A1.3, with A defined as the percent of students employed and B defined as the percent that students earn relative to their full earning potential. Base case results appear in the shaded row; here the assumptions remain unchanged, with A equal to 73% and B equal to 83%. Sensitivity analysis results are shown in non-shaded rows. Scenario 1 increases A to 100% while holding B constant, Scenario 2 increases B to 100% while holding A constant, Scenario 3 increases both A and B to 100%, and Scenario 4 decreases both A and B to 0%.

Table A1.3: Sensitivity analysis of student employment variables

Variations in assumptions	Net present value (millions)	Internal rate of return	Benefit-cost ratio
Base case: A = 73%, B = 83%	$76.6	20.3%	5.2
Scenario 1: A = 100%, B = 83%	$83.2	30.0%	8.0
Scenario 2: A = 73%, B = 100%	$80.2	24.5%	6.4
Scenario 3: A = 100%, B = 100%	$88.1	56.9%	13.9
Scenario 4: A = 0%, B = 0%	$58.9	11.7%	2.6

Note: A = percent of students employed; B = percent earned relative to statistical averages.

- **Scenario 1:** Increasing the percentage of students employed (A) from 73% to 100%, the net present value, internal rate of return, and benefit-cost ratio improve to $83.2 million, 30.0%, and 8.0, respectively, relative to base case results. Improved results are attributable to a lower opportunity cost of time; all students are employed in this case.
- **Scenario 2:** Increasing earnings relative to statistical averages (B) from 83% to 100%, the net present value, internal rate of return, and benefit-cost ratio results improve to $80.2 million, 24.5%, and 6.4, respectively, relative to base case results; this strong improvement, again, is attributable to a lower opportunity cost of time.
- **Scenario 3:** Increasing both assumptions A and B to 100% simultaneously, the net present value, internal rate of return, and benefit-cost ratio improve yet further to $88.1 million, 56.9%, and 13.9, respectively, relative to base case results. This scenario assumes that all students are fully employed and earning full salaries (equal to statistical averages) while attending classes.

- **Scenario 4:** Finally, decreasing both A and B to 0% reduces the net present value, internal rate of return, and benefit-cost ratio to $58.9 million, 11.7%, and 2.6, respectively, relative to base case results. These results are reflective of an increased opportunity cost; none of the students are employed in this case.[44]

It is strongly emphasized in this section that base case results are very attractive in that results are all above their threshold levels. As is clearly demonstrated here, results of the first three alternative scenarios appear much more attractive, although they overstate benefits. Results presented in Chapter 3 are realistic, indicating that investments in NMC generate excellent returns, well above the long-term average percent rates of return in stock and bond markets.

Discount rate

The discount rate is a rate of interest that converts future monies to their present value. In investment analysis, the discount rate accounts for two fundamental principles: 1) the time value of money, and 2) the level of risk that an investor is willing to accept. Time value of money refers to the value of money after interest or inflation has accrued over a given length of time. An investor must be willing to forgo the use of money in the present to receive compensation for it in the future. The discount rate also addresses the investors' risk preferences by serving as a proxy for the minimum rate of return that the proposed risky asset must be expected to yield before the investors will be persuaded to invest in it. Typically, this minimum rate of return is determined by the known returns of less risky assets where the investors might alternatively consider placing their money.

Table A1.4: Sensitivity analysis of discount rate

% variation in assumption	-50%	-25%	-10%	Base case	10%	25%	50%
Student perspective							
Discount rate	2.2%	3.3%	4.0%	4.4%	4.9%	5.5%	6.6%
Net present value (millions)	$123	$97	$84	$77	$70	$61	$49
Benefit-cost ratio	7.7	6.3	5.6	5.2	4.8	4.3	3.7
Taxpayer perspective							
Discount rate	0.10%	0.15%	0.18%	0.20%	0.22%	0.25%	0.30%
Net present value (millions)	$10.9	$10.5	$10.3	$10.2	$10.0	$9.8	$9.5
Benefit-cost ratio	1.42	1.41	1.40	1.39	1.39	1.38	1.37
Social perspective							
Discount rate	0.10%	0.15%	0.18%	0.20%	0.22%	0.25%	0.30%
Net present value (millions)	$364	$360	$358	$356	$354	$352	$348
Benefit-cost ratio	7.52	7.44	7.40	7.37	7.34	7.30	7.23

44 Note that reducing the percent of students employed to 0% automatically negates the percent they earn relative to full earning potential, since none of the students receive any earnings in this case.

In this study, we assume a 4.4% discount rate for students and a 0.2% discount rate for taxpayers and society.[45] Similar to the sensitivity analysis of the alternative education variable, we vary the base case discount rates for students, taxpayers, and society on either side by increasing the discount rate by 10%, 25%, and 50%, and then reducing it by 10%, 25%, and 50%.

As demonstrated in Table A1.4, an increase in the discount rate leads to a corresponding decrease in the expected returns, and vice versa. For example, increasing the student discount rate by 50% (from 4.4% to 6.6%) reduces the students' benefit-cost ratio from 5.2 to 3.7. Conversely, reducing the discount rate for students by 50% (from 4.4% to 2.2%) increases the benefit-cost ratio from 5.2 to 7.7. The sensitivity analysis results for taxpayers and society show the same inverse relationship.

Retained student variable

The retained student variable only affects the student spending impact calculation in Table 2.4. For this analysis, we assume a retained student variable of 10%, which means that 10% of NMC's students who originated from the NMC Service Area would have left the region for other opportunities, whether that be education or employment, if NMC did not exist. The money these retained students spent in the region for accommodation and other personal and household expenses is attributable to NMC.

Table A1.5 presents the results of the sensitivity analysis for the retained student variable. The assumption increases and decreases relative to the base case of 10% by the increments indicated in the table. The student spending impact is recalculated at each value of the assumption, holding all else constant. Student spending impacts attributable to NMC range from a high of $4.3 million when the retained student variable is 15% to a low of $2.1 million when the retained student variable is 5%. This means as the retained student variable decreases, the student spending attributable to NMC decreases. Even under the most conservative assumptions, the student spending impact on the NMC Service Area economy remains substantial.

Table A1.5: Sensitivity analysis of retained student variable

% variation in assumption	-50%	-25%	-10%	Base case	10%	25%	50%
Retained student variable	5%	8%	9%	10%	11%	13%	15%
Student spending impact (thousands)	$2,073	$2,628	$2,962	$3,184	$3,406	$3,739	$4,295

45 These values are based on the three-year average of the baseline forecasts for the 10-year Treasury rate published by the Congressional Budget Office and the real treasury interest rates reported by the Office of Management and Budget for 30-year investments. See the Congressional Budget Office "Table 5. Federal Student Loan Programs: Projected Interest Rates: CBO's May 2022 Baseline" and the Office of Management and Budget "Discount Rates for Cost-Effectiveness, Lease Purchase, and Related Analyses".

Appendix 2: Glossary of terms

Alternative education: A "with" and "without" measure of the percent of students who would still be able to avail themselves of education if the college under analysis did not exist. An estimate of 10%, for example, means that 10% of students do not depend directly on the existence of the college in order to obtain their education.

Alternative use of funds: A measure of how monies that are currently used to fund the college might otherwise have been used if the college did not exist.

Asset value: Capitalized value of a stream of future returns. Asset value measures what someone would have to pay today for an instrument that provides the same stream of future revenues.

Attrition rate: Rate at which students leave the workforce due to out-migration, unemployment, retirement, or death.

Benefit-cost ratio: Present value of benefits divided by present value of costs. If the benefit-cost ratio is greater than 1, then benefits exceed costs, and the investment is feasible.

Counterfactual scenario: What would have happened if a given event had not occurred. In the case of this economic impact study, the counterfactual scenario is a scenario where the college did not exist.

Credit hour equivalent: Credit hour equivalent, or CHE, is defined as 15 contact hours of education if on a semester system, and 10 contact hours if on a quarter system. In general, it requires 450 contact hours to complete one full-time equivalent, or FTE.

Demand: Relationship between the market price of education and the volume of education demanded (expressed in terms of enrollment). The law of the downward-sloping demand curve is related to the fact that enrollment increases only if the price (tuition and fees) is lowered, or conversely, enrollment decreases if price increases.

Discounting: Expressing future revenues and costs in present value terms.

Earnings (labor income): Income that is received as a result of labor; i.e., wages.

Economics: Study of the allocation of scarce resources among alternative and competing ends. Economics is not normative (what ought to be done), but positive (describes what is, or how people are likely to behave in response to economic changes).

Elasticity of demand: Degree of responsiveness of the quantity of education demanded (enrollment) to changes in market prices (tuition and fees). If a decrease in fees increases or decreases total enrollment by a significant amount, demand is elastic. If enrollment remains the same or changes only slightly, demand is inelastic.

Externalities: Impacts (positive and negative) for which there is no compensation. Positive externalities of education include improved social behaviors such as improved health, lower crime, and reduced demand for income assistance. Educational institutions do not receive compensation for these benefits but benefits still occur because education is statistically proven to lead to improved social behaviors.

Gross regional product: Measure of the final value of all goods and services produced in a region after netting out the cost of goods used in production. Alternatively, gross regional product (GRP) equals the combined incomes of all factors of production; i.e., labor, land, and capital. These include wages, salaries, proprietors' incomes, profits, rents, and other. Gross regional product is also sometimes called value added or added income.

Initial effect: Income generated by the initial injection of monies into the economy through the payroll of the college and the higher earnings of its students.

Input-output analysis: Relationship between a given set of demands for final goods and services and the implied amounts of manufactured inputs, raw materials, and labor that this requires. When educational institutions pay wages and salaries and spend money for supplies in the region, they also generate earnings in all sectors of the economy, thereby increasing the demand for goods and services and jobs. Moreover, as students enter or rejoin the workforce with higher skills, they earn higher salaries and wages. In turn, this generates more consumption and spending in other sectors of the economy.

Internal rate of return: Rate of interest that, when used to discount cash flows associated with investing in education, reduces its net present value to zero (i.e., where the present value of revenues accruing from the investment are just equal to the present value of costs incurred). This, in effect, is the breakeven rate of return on investment since it shows the highest rate of interest at which the investment makes neither a profit nor a loss.

Multiplier effect: Additional income created in the economy as the college and its students spend money in the region. It consists of the income created by the supply chain of the industries initially affected by the spending of the college and its students (i.e., the direct effect), income created by the supply chain of the initial supply chain (i.e., the indirect effect), and the income created by the increased spending of the household sector (i.e., the induced effect).

NAICS: The North American Industry Classification System (NAICS) classifies North American business establishment in order to better collect, analyze, and publish statistical data related to the business economy.

Net cash flow: Benefits minus costs, i.e., the sum of revenues accruing from an investment minus costs incurred.

Net present value: Net cash flow discounted to the present. All future cash flows are collapsed into one number, which, if positive, indicates feasibility. The result is expressed as a monetary measure.

Non-labor income: Income received from investments, such as rent, interest, and dividends.

Opportunity cost: Benefits foregone from alternative B once a decision is made to allocate resources to alternative A. Or, if individuals choose to attend college, they forego earnings that they would have received had they chosen instead to work full-time. Foregone earnings, therefore, are the "price tag" of choosing to attend college.

Payback period: Length of time required to recover an investment. The shorter the period, the more attractive the investment. The formula for computing payback period is:

Payback period = cost of investment/net return per period

Appendix 3: Frequently asked questions (FAQs)

This appendix provides answers to some frequently asked questions about the results.

What is economic impact analysis?

Economic impact analysis quantifies the impact from a given economic event – in this case, the presence of a college – on the economy of a specified region.

What is investment analysis?

Investment analysis is a standard method for determining whether or not an existing or proposed investment is economically viable. This methodology is appropriate in situations where a stakeholder puts up a certain amount of money with the expectation of receiving benefits in return, where the benefits that the stakeholder receives are distributed over time, and where a discount rate must be applied in order to account for the time value of money.

Do the results differ by region, and if so, why?

Yes. Regional economic data are drawn from Lightcast's proprietary MR-SAM model, the Census Bureau, and other sources to reflect the specific earnings levels, jobs numbers, unemployment rates, population demographics, and other key characteristics of the region served by the college. Therefore, model results for the college are specific to the given region.

Are the funds transferred to the college increasing in value, or simply being re-directed?

Lightcast's approach is not a simple "rearranging of the furniture" where the impact of operations spending is essentially a restatement of the level of funding received by the college. Rather, it is an impact assessment of the additional income created in the region as a result of the college spending on payroll and other non-pay expenditures, net of any impacts that would have occurred anyway if the college did not exist.

How do my college's rates of return compare to that of other institutions?

In general, Lightcast discourages comparisons between institutions since many factors, such as regional economic conditions, institutional differences, and student demographics are outside of the college's control. It is best to compare the rate of return to the discount rates of 4.4% (for students) and 0.2% (for society and taxpayers), which can also be seen as the opportunity cost of the investment (since these stakeholder groups could be spending their time and money in other investment schemes besides education). If the rate of return is higher than the discount rate, the stakeholder groups can expect to receive a positive return on their educational investment.

Lightcast recognizes that some institutions may want to make comparisons. As a word of caution, if comparing to an institution that had a study commissioned by a firm other than Lightcast, then differences in methodology will create an "apples to oranges" comparison and will therefore be difficult. The study results should be seen as unique to each institution.

Lightcast conducted an economic impact study for my college a few years ago. Why have results changed?

Lightcast is a leading provider of economic impact studies and labor market data to educational institutions, workforce planners, and regional developers in the U.S. and internationally. Since 2000, Lightcast has completed over 3,000 economic impact studies for educational institutions in three countries. Along the way we have worked to continuously update and improve our methodologies to ensure that they conform to best practices and stay relevant in today's economy. The present study reflects the latest version of our model, representing the most up-to-date theory, practices, and data for conducting economic impact and investment analyses. Many of our former assumptions have been replaced with observed data, and we have researched the latest sources in order to update the background data used in our model. Additionally, changes in the data the college provides to Lightcast can influence the results of the study.

Net present value (NPV): How do I communicate this in laymen's terms?

Which would you rather have: a dollar right now or a dollar 30 years from now? That most people will choose a dollar now is the crux of net present value. The preference for a dollar today means today's dollar is therefore worth more than it would be in the future (in most people's opinion). Because the dollar today is worth more than a dollar in 30 years, the dollar 30 years from now needs to be adjusted to express its worth today. Adjusting the values for this "time value of money" is called discounting and the result of adding them all up after discounting each value is called net present value.

Internal rate of return (IRR): How do I communicate this in laymen's terms?

Using the bank as an example, an individual needs to decide between spending all of their paycheck today and putting it into savings. If they spend it today, they know what it is worth: $1 = $1. If they put it into savings, they need to know that there will be some sort of return to them for spending those dollars in the future rather than now. This is why banks offer interest rates and deposit interest earnings. This makes it so an individual can expect, for example, a 3% return in the future for money that they put into savings now.

Total economic impact: How do I communicate this in laymen's terms?

Big numbers are great but putting them into perspective can be a challenge. To add perspective, find an industry with roughly the same "% of GRP" as your college (Table 1.3). This percentage represents its portion of the total gross regional product in the region (similar to the nationally recognized gross domestic product but at a regional level). This allows the college to say that their single brick and mortar campus does just as much for the NMC Service Area as the entire Utilities industry, for example. This powerful statement can help put the large total impact number into perspective.

Appendix 4: Example of sales versus income

Lightcast's economic impact study differs from many other studies because we prefer to report the impacts in terms of income rather than sales (or output). Income is synonymous with value added or gross regional product (GRP). Sales include all the intermediary costs associated with producing goods and services. Income is a net measure that excludes these intermediary costs:

Income = Sales – Intermediary Costs

For this reason, income is a more meaningful measure of new economic activity than reporting sales. This is evidenced by the use of gross domestic product (GDP)—a measure of income—by economists when considering the economic growth or size of a country. The difference is GRP reflects a region and GDP a country.

To demonstrate the difference between income and sales, let us consider an example of a baker's production of a loaf of bread. The baker buys the ingredients such as eggs, flour, and yeast for $2.00. He uses capital such as a mixer to combine the ingredients and an oven to bake the bread and convert it into a final product. Overhead costs for these steps are $1.00. Total intermediary costs are $3.00. The baker then sells the loaf of bread for $5.00.

The sales amount of the loaf of bread is $5.00. The income from the loaf of bread is equal to the sales amount less the intermediary costs:

Income = $5.00 – $3.00 = $2.00

In our analysis, we provide context behind the income figures by also reporting the associated number of jobs. The impacts are also reported in sales and earnings terms for reference.

Appendix 5: Lightcast MR-SAM

Lightcast's MR-SAM represents the flow of all economic transactions in a given region. It replaces Lightcast's previous input-output (IO) model, which operated with some 1,000 industries, four layers of government, a single household consumption sector, and an investment sector. The old IO model was used to simulate the ripple effects (i.e., multipliers) in the regional economy as a result of industries entering or exiting the region. The MR-SAM model performs the same tasks as the old IO model, but it also does much more. Along with the same 1,000 industries, government, household, and investment sectors embedded in the old IO tool, the MR-SAM exhibits much more functionality, a greater amount of data, and a higher level of detail on the demographic and occupational components of jobs (16 demographic cohorts and about 750 occupations are characterized).

This appendix presents a high-level overview of the MR-SAM. Additional documentation on the technical aspects of the model is available upon request.

Data sources for the model

The Lightcast MR-SAM model relies on a number of internal and external data sources, mostly compiled by the federal government. What follows is a listing and short explanation of our sources. The use of these data will be covered in more detail later in this appendix.

Lightcast Data are produced from many data sources to produce detailed industry, occupation, and demographic jobs and earnings data at the local level. This information (especially sales-to-jobs ratios derived from jobs and earnings-to-sales ratios) is used to help regionalize the national matrices as well as to disaggregate them into more detailed industries than are normally available.

BEA Make and Use Tables (MUT) are the basis for input-output models in the U.S. The make table is a matrix that describes the amount of each commodity made by each industry in a given year. Industries are placed in the rows and commodities in the columns. The use table is a matrix that describes the amount of each commodity used by each industry in a given year. In the use table, commodities are placed in the rows and industries in the columns. The BEA produces two different sets of MUTs, the benchmark and the summary. The benchmark set contains about 500 sectors and is released every five years, with a five-year lag time (e.g., 2002 benchmark MUTs were released in 2007). The summary set contains about 80 sectors and is released every year, with a two-year lag (e.g., 2010 summary MUTs were released in late 2011/early 2012). The MUTs are used in the Lightcast MR-SAM model to produce an industry-by-industry matrix describing all industry purchases from all industries.

BEA Gross Domestic Product by State (GSP) describes gross domestic product from the value added (also known as added income) perspective. Value added is equal to employee compensation, gross operating surplus, and taxes on production and imports, less subsidies. Each of these components is reported for each state and an aggregate group of industries. This dataset is updated once per year, with a one-year lag. The Lightcast MR-SAM model makes use of this data as a control and pegs certain pieces of the model to values from this dataset.

BEA National Income and Product Accounts (NIPA) cover a wide variety of economic measures for the nation, including gross domestic product (GDP), sources of output, and distribution of income. This dataset is updated periodically throughout the year and can be between a month and several years old depending on the specific account. NIPA data are used in many of the Lightcast MR-SAM processes as both controls and seeds.

BEA Local Area Income (LPI) encapsulates multiple tables with geographies down to the county level. The following two tables are specifically used: CA05 (Personal income and earnings by industry) and CA91 (Gross flow of earnings). CA91 is used when creating the commuting submodel and CA05 is used in several processes to help with place-of-work and place-of-residence differences, as well as to calculate personal income, transfers, dividends, interest, and rent.

Bureau of Labor Statistics Consumer Expenditure Survey (CEX) reports on the buying habits of consumers along with some information as to their income, consumer unit, and demographics. Lightcast utilizes this data heavily in the creation of the national demographic by income type consumption on industries.

Census of Government's (CoG) state and local government finance dataset is used specifically to aid breaking out state and local data that is reported in the MUTs. This allows Lightcast to have unique production functions for each of its state and local government sectors.

Census' OnTheMap (OTM) is a collection of three datasets for the census block level for multiple years. **Origin-Destination (OD)** offers job totals associated with both home census blocks and a work census block. **Residence Area Characteristics (RAC)** offers jobs totaled by home census block. **Workplace Area Characteristics (WAC)** offers jobs totaled by work census block. All three of these are used in the commuting submodel to gain better estimates of earnings by industry that may be counted as commuting. This dataset has holes for specific years and regions. These holes are filled with Census' Journey-to-Work described later.

Census' Current Population Survey (CPS) is used as the basis for the demographic breakout data of the MR-SAM model. This set is used to estimate the ratios of demographic cohorts and their income for the three different income categories (i.e., wages, property income, and transfers).

Census' Journey-to-Work (JtW) is part of the 2000 Census and describes the amount of commuting jobs between counties. This set is used to fill in the areas where OTM does not have data.

Census' American Community Survey (ACS) Public Use Microdata Sample (PUMS) is the replacement for Census' long form and is used by Lightcast to fill the holes in the CPS data.

Oak Ridge National Lab (ORNL) County-to-County Distance Matrix (Skim Tree) contains a matrix of distances and network impedances between each county via various modes of transportation such as highway, railroad, water, and combined highway-rail. Also included in this set are minimum impedances utilizing the best combination of paths. The ORNL distance matrix is used in Lightcast's gravitational flows model that estimates the amount of trade between counties in the country.

Overview of the MR-SAM model

Lightcast's MR-SAM modeling system is a comparative static model in the same general class as RIMS II (Bureau of Economic Analysis) and IMPLAN (Minnesota Implan Group). The MR-SAM model is thus not an econometric model, the primary example of which is PolicyInsight by REMI. It relies on a matrix representation of industry-to-industry purchasing patterns originally based on national data which are regionalized with the use of local data and mathematical manipulation (i.e., non-survey methods). Models of this type estimate the ripple effects of changes in jobs, earnings, or sales in one or more industries upon other industries in a region.

The Lightcast MR-SAM model shows final equilibrium impacts—that is, the user enters a change that perturbs the economy and the model shows the changes required to establish a new equilibrium. As such, it is not a dynamic model that shows year-by-year changes over time (as REMI's does).

National SAM

Following standard practice, the SAM model appears as a square matrix, with each row sum exactly equaling the corresponding column sum. Reflecting its kinship with the standard Leontief input-output framework, individual SAM elements show accounting flows between row and column sectors during a chosen base year. Read across rows, SAM entries show the flow of funds into column accounts (also known as receipts or the appropriation of funds by those column accounts). Read down columns, SAM entries show the flow of funds into row accounts (also known as expenditures or the dispersal of funds to those row accounts).

The SAM may be broken into three different aggregation layers: broad accounts, sub-accounts, and detailed accounts. The broad layer is the most aggregate and will be covered first. Broad accounts cover between one and four sub-accounts, which in turn cover many detailed accounts. This appendix will not discuss detailed accounts directly because of their number. For example, in the industry broad account, there are two sub-accounts and over 1,000 detailed accounts.

Multi-regional aspect of the MR-SAM

Multi-regional (MR) describes a non-survey model that has the ability to analyze the transactions and ripple effects (i.e., multipliers) of not just a single region, but multiple regions interacting with each other. Regions in this case are made up of a collection of counties.

Lightcast's multi-regional model is built off of gravitational flows, assuming that the larger a county's economy, the more influence it will have on the surrounding counties' purchases and sales. The equation behind this model is essentially the same that Isaac Newton used to calculate the gravitational pull between planets and stars. In Newton's equation, the masses of both objects are multiplied, then divided by the distance separating them and multiplied by a constant. In Lightcast's model, the masses are replaced with the supply of a sector for one county and the demand for that same sector from another county. The distance is replaced with an impedance value that considers the distance, type of roads, rail lines, and other modes of transportation. Once this is calculated for every county-to-county pair, a set of mathematical operations is performed to make sure all counties absorb the correct amount of supply from every county and the correct amount of demand from every county. These operations produce more than 200 million data points.

Components of the Lightcast MR-SAM model

The Lightcast MR-SAM is built from a number of different components that are gathered together to display information whenever a user selects a region. What follows is a description of each of these components and how each is created. Lightcast's internally created data are used to a great extent throughout the processes described below, but its creation is not described in this appendix.

County earnings distribution matrix

The county earnings distribution matrices describe the earnings spent by every industry on every occupation for a year—i.e., earnings by occupation. The matrices are built utilizing Lightcast's industry earnings, occupational average earnings, and staffing patterns.

Each matrix starts with a region's staffing pattern matrix which is multiplied by the industry jobs vector. This produces the number of occupational jobs in each industry for the region. Next, the occupational average hourly earnings per job are multiplied by 2,080 hours, which converts the average hourly earnings into a yearly estimate. Then the matrix of occupational jobs is multiplied by the occupational annual earnings per job, converting it into earnings values. Last, all earnings are adjusted to match the known industry totals. This is a fairly simple process, but one that is very important. These matrices describe the place-of-work earnings used by the MR-SAM.

Commuting model

The commuting sub-model is an integral part of Lightcast's MR-SAM model. It allows the regional and multi-regional models to know what amount of the earnings can be

attributed to place-of-residence vs. place-of-work. The commuting data describe the flow of earnings from any county to any other county (including within the counties themselves). For this situation, the commuted earnings are not just a single value describing total earnings flows over a complete year but are broken out by occupation and demographic. Breaking out the earnings allows for analysis of place-of-residence and place-of-work earnings. These data are created using Bureau of Labor Statistics' OnTheMap dataset, Census' Journey-to-Work, BEA's LPI CA91 and CA05 tables, and some of Lightcast's data. The process incorporates the cleanup and disaggregation of the OnTheMap data, the estimation of a closed system of county inflows and outflows of earnings, and the creation of finalized commuting data.

National SAM

The national SAM as described above is made up of several different components. Many of the elements discussed are filled in with values from the national Z matrix—or industry-to-industry transaction matrix. This matrix is built from BEA data that describe which industries make and use what commodities at the national level. These data are manipulated with some industry standard equations to produce the national Z matrix. The data in the Z matrix act as the basis for the majority of the data in the national SAM. The rest of the values are filled in with data from the county earnings distribution matrices, the commuting data, and the BEA's National Income and Product Accounts.

One of the major issues that affect any SAM project is the combination of data from multiple sources that may not be consistent with one another. Matrix balancing is the broad name for the techniques used to correct this problem. Lightcast uses a modification of the "diagonal similarity scaling" algorithm to balance the national SAM.

Gravitational flows model

The most important piece of the Lightcast MR-SAM model is the gravitational flows model that produces county-by-county regional purchasing coefficients (RPCs). RPCs estimate how much an industry purchases from other industries inside and outside of the defined region. This information is critical for calculating all IO models.

Gravity modeling starts with the creation of an impedance matrix that values the difficulty of moving a product from county to county. For each sector, an impedance matrix is created based on a set of distance impedance methods for that sector. A distance impedance method is one of the measurements reported in the Oak Ridge National Laboratory's County-to-County Distance Matrix. In this matrix, every county-to-county relationship is accounted for in six measures: great-circle distance, highway impedance, rail miles, rail impedance, water impedance, and highway-rail-highway impedance. Next, using the impedance information, the trade flows for each industry in every county are solved for. The result is an estimate of multi-regional flows from every county to every county. These flows are divided by each respective county's demand to produce multi-regional RPCs.

Appendix 6: Value per credit hour equivalent and the Mincer function

Two key components in the analysis are 1) the value of the students' educational achievements, and 2) the change in that value over the students' working careers. Both of these components are described in detail in this appendix.

Value per CHE

Typically, the educational achievements of students are marked by the credentials they earn. However, not all students who attended NMC in the 2021-22 analysis year obtained a degree or certificate. Some returned the following year to complete their education goals, while others took a few courses and entered the workforce without graduating. As such, the only way to measure the value of the students' achievement is through their credit hour equivalents, or CHEs. This approach allows us to see the benefits to all students who attended the college, not just those who earned a credential.

To calculate the value per CHE, we first determine how many CHEs are required to complete each education level. For example, assuming that there are 30 CHEs in an academic year, a student generally completes 120 CHEs in order to move from a high school diploma to a bachelor's degree, another 60 CHEs to move from a bachelor's degree to a master's degree, and so on. This progression of CHEs generates an education ladder beginning at the less than high school level and ending with the completion of a doctoral degree, with each level of education representing a separate stage in the progression.

The second step is to assign a unique value to the CHEs in the education ladder based on the wage differentials presented in Table 1.4.[46] For example, the difference in regional earnings between a high school diploma and an associate degree is $8,100. We spread this $8,100 wage differential across the 60 CHEs that occur between a high school diploma and an associate degree, applying a ceremonial "boost" to the last CHE in the stage to mark the achievement of the degree.[47] We repeat this process for each education level in the ladder.

46 The value per CHE is calculated differently between the economic impact analysis and the investment analysis. The economic impact analysis uses the region as its background and, therefore, uses regional earnings to calculate value per CHE, while the investment analysis uses the state as its backdrop and, therefore, uses state earnings. The methodology outlined in this appendix will use regional earnings; however, the same methodology is followed for the investment analysis when state earnings are used.

47 Economic theory holds that workers that acquire education credentials send a signal to employers about their ability level. This phenomenon is commonly known as the sheepskin effect or signaling effect. The ceremonial boosts applied to the achievement of degrees in the Lightcast impact model are derived from Jaeger and Page (1996).

Next, we map the CHE production of the FY 2021-22 student population to the education ladder. Table 1.2 provides information on the CHE production of students attending NMC, broken out by educational achievement. In total, students completed 52,374 CHEs during the analysis year, excluding personal enrichment students. We map each of these CHEs to the education ladder depending on the students' education level and the average number of CHEs they completed during the year. For example, bachelor's degree graduates are allocated to the stage between the associate degree and the bachelor's degree, and the average number of CHEs they completed informs the shape of the distribution curve used to spread out their total CHE production within that stage of the progression.

The sum product of the CHEs earned at each step within the education ladder and their corresponding value yields the students' aggregate annual increase in income (ΔE), as shown in the following equation:

$$\Delta E = \sum_{i=1}^{n} e_i h_i \text{ where } i \in 1, 2, \ldots n$$

and n is the number of steps in the education ladder, e_i is the marginal earnings gain at step i, and h_i is the number of CHEs completed at step i.

Table A6.1 displays the result for the students' aggregate annual increase in income (ΔE), a total of $6.4 million. By dividing this value by the students' total production of 52,374 CHEs during the analysis year, we derive an overall value of $123 per CHE.

Table A6.1: Aggregate annual increase in income of students and value per CHE

Aggregate annual increase in income	$6,416,378
Total credit hour equivalents (CHEs) in FY 2021-22*	52,374
Value per CHE	**$123**

* Excludes the CHE production of personal enrichment students.

Source: Lightcast impact model.

Mincer function

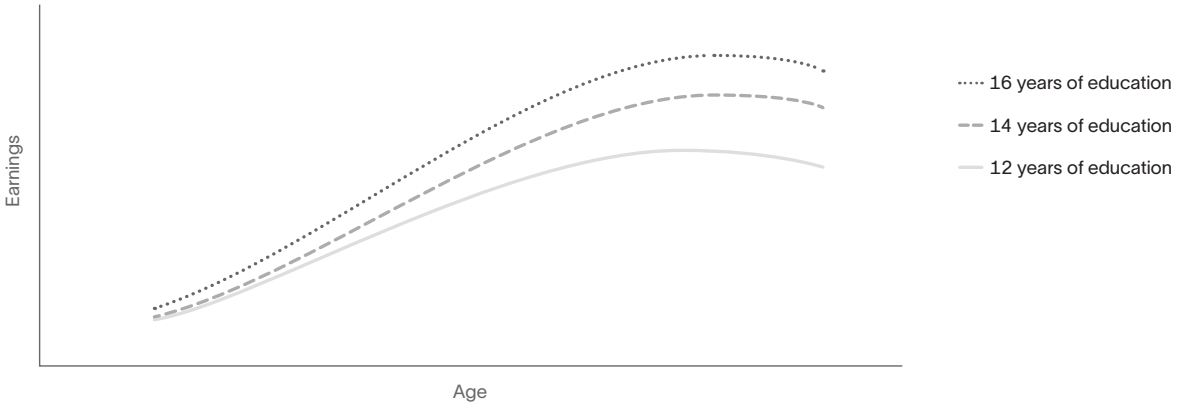
The $123 value per CHE in Table A6.1 only tells part of the story, however. Human capital theory holds that earnings levels do not remain constant; rather, they start relatively low and gradually increase as the worker gains more experience. Research also shows that the earnings increment between educated and non-educated workers grows through time. These basic patterns in earnings over time were originally identified by Jacob Mincer, who viewed the lifecycle earnings distribution as a function with the key elements being earnings, years of education, and work experience, with age serving as a proxy for experience.[48] While some have criticized Mincer's earnings function, it is still upheld in recent data and has served as the foundation for a variety of research pertaining to labor economics. Those critical of the Mincer function point to several

48 See Mincer (1958 and 1974).

unobserved factors such as ability, socioeconomic status, and family background that also help explain higher earnings. Failure to account for these factors results in what is known as an "ability bias." Research by Card (1999 and 2001) suggests that the benefits estimated using Mincer's function are biased upwards by 10% or less. As such, we reduce the estimated benefits by 10%. We use state-specific and education level-specific Mincer coefficients.

Figure A6.1 illustrates several important points about the Mincer function. First, as demonstrated by the shape of the curves, an individual's earnings initially increase at an increasing rate, then increase at a decreasing rate, reach a maximum somewhere well after the midpoint of the working career, and then decline in later years. Second, individuals with higher levels of education reach their maximum earnings at an older age compared to individuals with lower levels of education (recall that age serves as a proxy for years of experience). And third, the benefits of education, as measured by the difference in earnings between education levels, increase with age.

Figure A6.1: Lifecycle change in earnings



In calculating the alumni impact in Chapter 2, we use the slope of the curve in Mincer's earnings function to condition the $123 value per CHE to the students' age and work experience. To the students just starting their career during the analysis year, we apply a lower value per CHE; to the students in the latter half or approaching the end of their careers we apply a higher value per CHE. The original $123 value per CHE applies only to the CHE production of students precisely at the midpoint of their careers during the analysis year.

In Chapter 3 we again apply the Mincer function, this time to project the benefits stream of the FY 2021-22 student population into the future. Here too the value per CHE is lower for students at the start of their career and higher near the end of it, in accordance with the scalars derived from the slope of the Mincer curve illustrated in Figure A6.1.

Appendix 7: Alternative education variable

In a scenario where the college did not exist, some of its students would still be able to avail themselves of an alternative comparable education. These students create benefits in the region even in the absence of the college. The alternative education variable accounts for these students and is used to discount the benefits we attribute to the college.

Recall this analysis considers only relevant economic information regarding the college. Considering the existence of various other academic institutions surrounding the college, we have to assume that a portion of the students could find alternative education and either remain in or return to the region. For example, some students may participate in online programs while remaining in the region. Others may attend an out-of-region institution and return to the region upon completing their studies. For these students – who would have found an alternative education and produced benefits in the region regardless of the presence of the college – we discount the benefits attributed to the college. An important distinction must be made here: the benefits from students who would find alternative education outside the region and not return to the region are not discounted. Because these benefits would not occur in the region without the presence of the college, they must be included.

In the absence of the college, we assume 15% of the college's students would find alternative education opportunities and remain in or return to the region. We account for this by discounting the alumni impact, the benefits to taxpayers, and the benefits to society in the region in Chapters 2 and 3 by 15%. In other words, we assume 15% of the benefits created by the college's students would have occurred anyway in the counterfactual scenario where the college did not exist. A sensitivity analysis of this adjustment is presented in Appendix 1.

Appendix 8: Overview of investment analysis measures

The appendix provides context to the investment analysis results using the simple hypothetical example summarized in Table A8.1 below. The table shows the projected benefits and costs for a single student over time and associated investment analysis results.[49]

Table A8.1: Example of the benefits and costs of education for a single student

1	2	3	4	5	6
Year	**Tuition**	**Opportunity cost**	**Total cost**	**Higher earnings**	**Net cash flow**
1	$1,500	$20,000	$21,500	$0	-$21,500
2	$0	$0	$0	$5,000	$5,000
3	$0	$0	$0	$5,000	$5,000
4	$0	$0	$0	$5,000	$5,000
5	$0	$0	$0	$5,000	$5,000
6	$0	$0	$0	$5,000	$5,000
7	$0	$0	$0	$5,000	$5,000
8	$0	$0	$0	$5,000	$5,000
9	$0	$0	$0	$5,000	$5,000
10	$0	$0	$0	$5,000	$5,000
Net present value			**$21,500**	**$35,753**	**$14,253**

Benefit-cost ratio
1.7

Internal rate of return
18.0%

Payback period (years)
4.2

Assumptions are as follows:

- Benefits and costs are projected out 10 years into the future (Column 1).
- The student attends the college for one year, and the cost of tuition is $1,500 (Column 2).
- Earnings foregone while attending the college for one year (opportunity cost) come to $20,000 (Column 3).

49 Note that this is a hypothetical example. The numbers used are not based on data collected from an existing college.

- Together, tuition and earnings foregone cost sum to $21,500. This represents the out-of-pocket investment made by the student (Column 4).
- In return, the student earns $5,000 more per year than he otherwise would have earned without the education (Column 5).
- The net cash flow (NCF) in Column 6 shows higher earnings (Column 5) less the total cost (Column 4).
- The assumed going rate of interest is 4%, the rate of return from alternative investment schemes for the use of the $21,500.

Results are expressed in standard investment analysis terms, which are as follows: the net present value, the internal rate of return, the benefit-cost ratio, and the payback period. Each of these is briefly explained below in the context of the cash flow numbers presented in Table A8.1.

Net present value

The student in Table A8.1 can choose either to attend college or to forego post-secondary education and maintain his present employment. If he decides to enroll, certain economic implications unfold. Tuition and fees must be paid, and earnings will cease for one year. In exchange, the student calculates that with post-secondary education, his earnings will increase by at least the $5,000 per year, as indicated in the table.

The question is simple: Will the prospective student be economically better off by choosing to enroll? If he adds up higher earnings of $5,000 per year for the remaining nine years in Table A8.1, the total will be $45,000. Compared to a total investment of $21,500, this appears to be a very solid investment. The reality, however, is different. Benefits are far lower than $45,000 because future money is worth less than present money. Costs (tuition plus earnings foregone) are felt immediately because they are incurred today, in the present. Benefits, on the other hand, occur in the future. They are not yet available. All future benefits must be discounted by the going rate of interest (referred to as the discount rate) to be able to express them in present value terms.[50]

Let us take a brief example. At 4%, the present value of $5,000 to be received one year from today is $4,807. If the $5,000 were to be received in year 10, the present value would reduce to $3,377. Put another way, $4,807 deposited in the bank today earning 4% interest will grow to $5,000 in one year; and $3,377 deposited today would grow to $5,000 in 10 years. An "economically rational" person would, therefore, be equally satisfied receiving $3,377 today or $5,000 10 years from today given the going rate of interest of 4%. The process of discounting—finding the present value of future higher earnings—allows the model to express values on an equal basis in future or present value terms.

50 Technically, the interest rate is applied to compounding—the process of looking at deposits today and determining how much they will be worth in the future. The same interest rate is called a discount rate when the process is reversed—determining the present value of future earnings.

The goal is to express all future higher earnings in present value terms so that they can be compared to investments incurred today (in this example, tuition plus earnings foregone). As indicated in Table A8.1 the cumulative present value of $5,000 worth of higher earnings between years 2 and 10 is $35,753 given the 4% interest rate, far lower than the undiscounted $45,000 discussed above.

The net present value of the investment is $14,253. This is simply the present value of the benefits less the present value of the costs, or $35,753 - $21,500 = $14,253. In other words, the present value of benefits exceeds the present value of costs by as much as $14,253. The criterion for an economically worthwhile investment is that the net present value is equal to or greater than zero. Given this result, it can be concluded that, in this case, and given these assumptions, this particular investment in education is very strong.

Internal rate of return

The internal rate of return is another way of measuring the worth of investing in education using the same cash flows shown in Table A8.1. In technical terms, the internal rate of return is a measure of the average earning power of money used over the life of the investment. It is simply the interest rate that makes the net present value equal to zero. In the discussion of the net present value above, the model applies the going rate of interest of 4% and computes a positive net present value of $14,253. The question now is what the interest rate would have to be in order to reduce the net present value to zero. Obviously, it would have to be higher—18.0% in fact, as indicated in Table A8.1. Or, if a discount rate of 18.0% were applied to the net present value calculations instead of the 4%, then the net present value would reduce to zero.

What does this mean? The internal rate of return of 18.0% defines a breakeven solution—the point where the present value of benefits just equals the present value of costs, or where the net present value equals zero. Or, at 18.0%, higher earnings of $5,000 per year for the next nine years will earn back all investments of $21,500 made plus pay 18.0% for the use of that money ($21,500) in the meantime. Is this a good return? Indeed, it is. If it is compared to the 4% going rate of interest applied to the net present value calculations, 18.0% is far higher than 4%. It may be concluded, therefore, that the investment in this case is solid. Alternatively, comparing the 18.0% rate of return to the long-term 9.6% rate or so obtained from investments in stocks and bonds also indicates that the investment in education is strong relative to the stock market returns (on average).

Benefit-cost ratio

The benefit-cost ratio is simply the present value of benefits divided by present value of costs, or $35,753 ÷ $21,500 = 1.7 (based on the 4% discount rate). Of course, any change in the discount rate would also change the benefit-cost ratio. Applying the 18.0% internal rate of return discussed above would reduce the benefit-cost ratio to 1.0, the breakeven solution where benefits just equal costs. Applying a discount rate higher than the 18.0% would reduce the ratio to lower than 1.0, and the investment

would not be feasible. The 1.7 ratio means that a dollar invested today will return a cumulative $1.70 over the ten-year time period.

Payback period

This is the length of time from the beginning of the investment (consisting of tuition and earnings foregone) until higher future earnings give a return on the investment made. For the student in Table A8.1, it will take roughly 4.2 years of $5,000 worth of higher earnings to recapture his investment of $1,500 in tuition and the $20,000 in earnings foregone while attending the college. Higher earnings that occur beyond 4.2 years are the returns that make the investment in education in this example economically worthwhile. The payback period is a fairly rough, albeit common, means of choosing between investments. The shorter the payback period, the stronger the investment.

Appendix 9: Shutdown point

The investment analysis in Chapter 3 weighs the benefits generated by the college against the state and local taxpayer funding that the college receives to support its operations. An important part of this analysis is factoring out the benefits that the college would have been able to generate anyway, even without state and local taxpayer support. This adjustment is used to establish a direct link between what taxpayers pay and what they receive in return. If the college is able to generate benefits without taxpayer support, then it would not be a true investment.[51]

The overall approach includes a sub-model that simulates the effect on student enrollment if the college loses its state and local funding and has to raise student tuition and fees in order to stay open. If the college can still operate without state and local support, then any benefits it generates at that level are discounted from total benefit estimates. If the simulation indicates that the college cannot stay open, however, then benefits are directly linked to costs, and no discounting applies. This appendix documents the underlying theory behind these adjustments.

State and local government support versus student demand for education

Figure A9.1 presents a simple model of student demand and state and local government support. The right side of the graph is a standard demand curve (*D*) showing student enrollment as a function of student tuition and fees. Enrollment is measured in terms of total credit hour equivalents (CHEs) and expressed as a percentage of the college's current CHE production. Current student tuition and fees are represented by *p*', and state and local government support covers *C%* of all costs. At this point in the analysis, it is assumed that the college has only two sources of revenues: 1) student tuition and fees and 2) state and local government support.

Figure A9.2 shows another important reference point in the model—where state and local government support is 0%, student tuition and fees are increased to *p*", and CHE production is at *Z%* (less than 100%). The reduction in CHEs reflects the price elasticity of the students' demand for education, i.e., the extent to which the students' decision to attend the college is affected by the change in tuition and fees. Ignoring for the moment those issues concerning the college's minimum operating scale (considered below in the section called "Calculating benefits at the shutdown point"), the implication for the investment analysis is that benefits to state and local government must be adjusted to

51 Of course, as a public training provider, the college would not be permitted to continue without public funding, so the situation in which it would lose all state support is entirely hypothetical. The purpose of the adjustment factor is to examine the college in standard investment analysis terms by netting out any benefits it may be able to generate that are not directly linked to the costs of supporting it.

net out the benefits that the college can provide absent state and local government support, represented as *Z%* of the college's current CHE production in Figure A9.2.

Figure A9.1: Student demand and government funding by tuition and fees

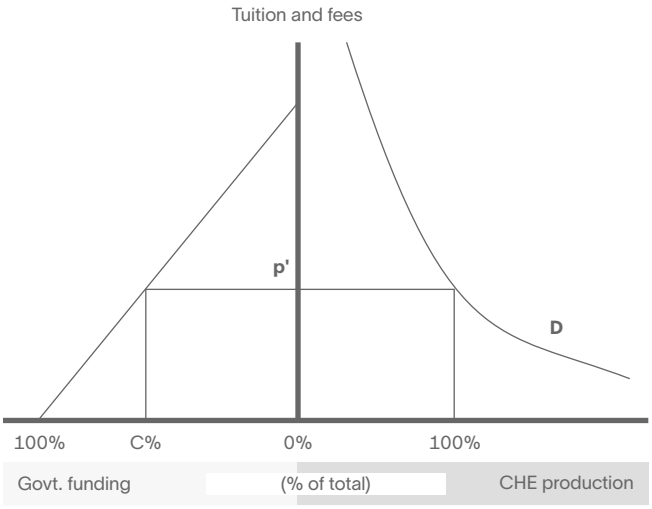
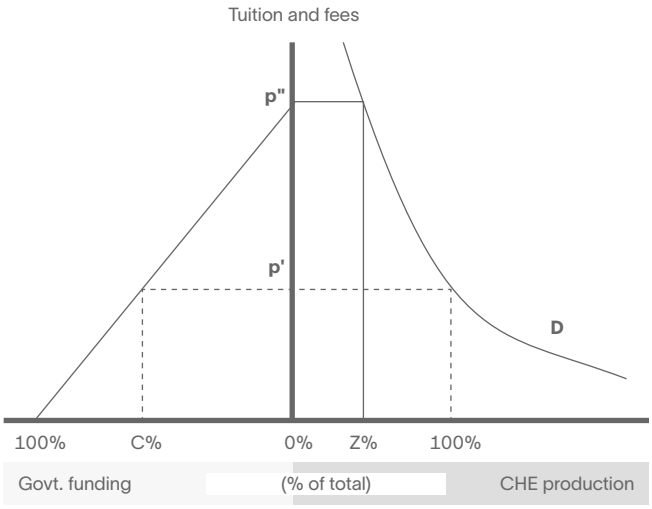


Figure A9.2: CHE production and government funding by tuition and fees



To clarify the argument, it is useful to consider the role of enrollment in the larger benefit-cost model. Let *B* equal the benefits attributable to state and local government support. The analysis derives all benefits as a function of student enrollment, measured in terms of CHEs produced. For consistency with the graphs in this appendix, *B* is expressed as a function of the percent of the college's current CHE production. Equation 1 is thus as follows:

$$1) \quad B = B\,(100\%)$$

This reflects the total benefits generated by enrollments at their current levels.

Consider benefits now with reference to *Z*. The point at which state and local government support is zero nonetheless provides for *Z%* (less than 100%) of the current enrollment, and benefits are symbolically indicated by the following equation:

$$2) \quad B = B\,(Z\%)$$

Inasmuch as the benefits in equation 2 occur with or without state and local government support, the benefits appropriately attributed to state and local government support are given by equation 3 as follows:

$$3) \quad B = B\,(100\%) - B\,(Z\%)$$

Calculating benefits at the shutdown point

Colleges and universities cease to operate when the revenue they receive from the quantity of education demanded is insufficient to justify their continued operations. This is commonly known in economics as the shutdown point.[52] The shutdown point is introduced graphically in Figure A9.3 as *S%*. The location of point *S%* indicates that the college can operate at an even lower enrollment level than *Z%* (the point at which the college receives zero state and local government funding). State and local government support at point *S%* is still zero, and student tuition and fees have been raised to *p'''*. State and local government support is thus credited with the benefits given by equation 3, or *B = B (100%) – B (Z%)*. With student tuition and fees still higher than *p'''*, the college would no longer be able to attract enough students to keep the doors open, and it would shut down.

Figure A9.4 illustrates yet another scenario. Here, the shutdown point occurs at a level of CHE production greater than *Z%* (the level of zero state and local government support), meaning some minimum level of state and local government support is needed for the college to operate at all. This minimum portion of overall funding is indicated by *S'%* on the left side of the chart, and as before, the shutdown point is indicated by *S%* on the right side of chart. In this case, state and local government support is appropriately credited with all the benefits generated by the college's CHE production, or *B = B (100%)*.

Figure A9.3: Shutdown point after zero government funding

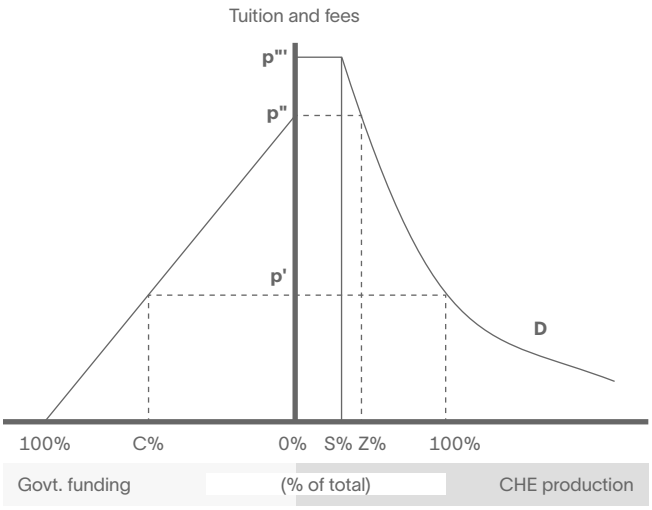
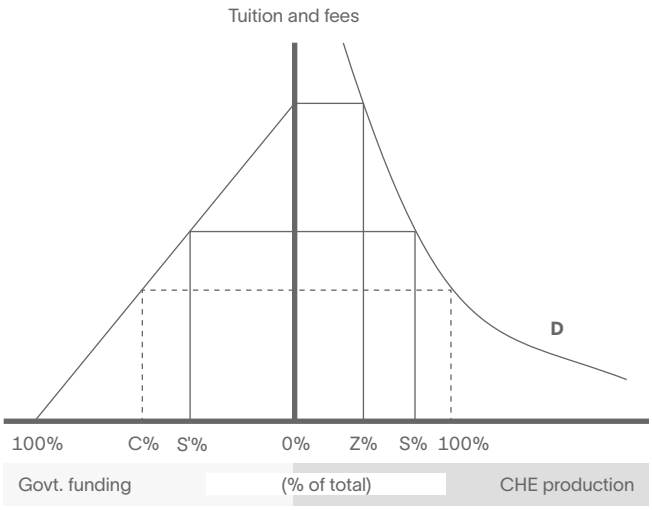


Figure A9.4: Shutdown point before zero government funding



52 In the traditional sense, the shutdown point applies to firms seeking to maximize profits and minimize losses. Although profit maximization is not the primary aim of colleges and universities, the principle remains the same, i.e., that there is a minimum scale of operation required in order for colleges and universities to stay open.

Appendix 10: Social externalities

Education has a predictable and positive effect on a diverse array of social benefits. These, when quantified in dollar terms, represent significant social savings that directly benefit society communities and citizens throughout the region, including taxpayers. In this appendix we discuss the following three main benefit categories: 1) improved health, 2) reductions in crime, and 3) reduced demand for government-funded income assistance.

It is important to note that the data and estimates presented here should not be viewed as exact, but rather as indicative of the positive impacts of education on an individual's quality of life. The process of quantifying these impacts requires a number of assumptions to be made, creating a level of uncertainty that should be borne in mind when reviewing the results.

Health

Statistics show a correlation between increased education and improved health. The manifestations of this are found in five health-related variables: smoking, alcohol dependence, obesity, depression, and drug abuse. There are other health-related areas that link to educational attainment, but these are omitted from the analysis until we can invoke adequate (and mutually exclusive) databases and are able to fully develop the functional relationships between them.

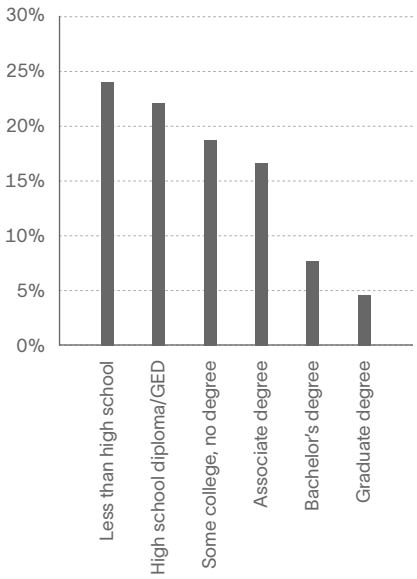
Smoking

Despite a marked decline over the last several decades in the percentage of U.S. residents who smoke, a sizeable percentage of the U.S. population still smokes. The negative health effects of smoking are well documented in the literature, which identifies smoking as one of the most serious health issues in the U.S.

Figure A10.1 shows the prevalence of cigarette smoking among adults, 25 years and over, based on data provided by the National Health Interview Survey.[53] The data include adults who reported smoking more than 100 cigarettes during their lifetime and who, at the time of interview, reported smoking every day or some days. As indicated, the percent of who smoke begins to decline beyond the level of high school education.

The Centers for Disease Control and Prevention (CDC) reports the percentage of adults who are current smokers by state.[54] We use this information to create an index

Figure A10.1: Prevalence of smoking among U.S. adults by education level



Source: Centers for Disease Control and Prevention.

53 Centers for Disease Control and Prevention. "Table. Characteristics of current adult cigarette smokers," National Health Interview Survey, United States, 2016.

54 Centers for Disease Control and Prevention. "Current Cigarette Use Among Adults (Behavior Risk Factor Surveillance System) 2018." *Behavioral Risk Factor Surveillance System Prevalence and Trends Data,* 2018.

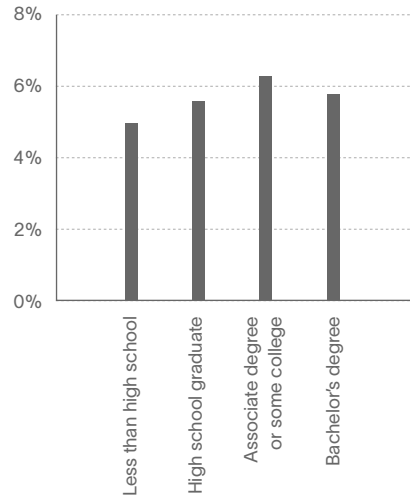
value by which we adjust the national prevalence data on smoking to each state. For example, 18.9% of Michigan adults were smokers in 2018, relative to 15.9% for the nation. We thus apply a scalar of 1.19 to the national probabilities of smoking in order to adjust them to the state of Michigan.

Alcohol dependence

Although alcohol dependence has large public and private costs, it is difficult to measure and define. There are many patterns of drinking, ranging from abstinence to heavy drinking. Alcohol abuse is riddled with social costs, including health care expenditures for treatment, prevention, and support; workplace losses due to reduced worker productivity; and other effects.

Figure A10.2 compares the percentage of adults, 18 and older, that abuse or depend on alcohol by education level, based on data from the Substance Abuse and Mental Health Services Administration (SAMHSA).[55] These statistics give an indication of the correlation between education and the reduced probability of alcohol dependence. Adults with an associate degree or some college have higher rates of alcohol dependence than adults with a high school diploma or lower. Prevalence rates are lower for adults with a bachelor's degree or higher than those with an associate degree or some college. Although the data do not maintain a pattern of decreased alcohol dependence at every level of increased education, we include these rates in our model to ensure we provide a comprehensive view of the social benefits and costs correlated with education.

Figure A10.2: Prevalence of alcohol dependence or abuse by education level



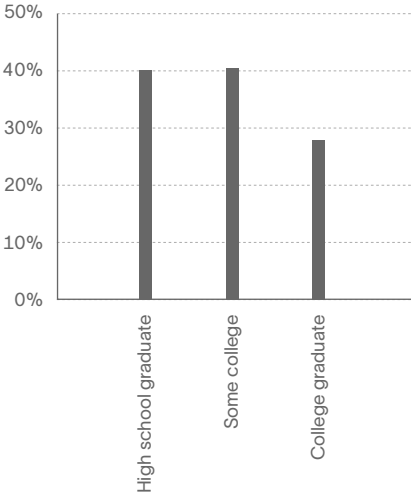
Source: Centers for Disease Control and Prevention.

Obesity

The rise in obesity and diet-related chronic diseases has led to increased attention on how expenditures relating to obesity have increased in recent years. The average cost of obesity-related medical conditions is calculated using information from the *Journal of Occupational and Environmental Medicine*, which reports incremental medical expenditures and productivity losses due to excess weight.[56]

Data for Figure A10.3 is derived from the National Center for Health Statistics which shows the prevalence of obesity among adults aged 20 years and over by education, gender, and ethnicity.[57] As indicated, college graduates are less likely to be obese than individuals with a high school diploma. However, the prevalence of obesity among adults with some college is actually greater than those with just a high school diploma. In general, though, obesity tends to decline with increasing levels of education.

Figure A10.3: Prevalence of obesity by education level



Source: Derived from data provided by the National Center for Health Statistics.

55 Substance Abuse and Mental Health Services Administration. "Table 5.4B—Alcohol Use Disorder in Past Year among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2017 and 2018." SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2017 and 2018.

56 Eric A. Finkelstein, Marco da Costa DiBonaventura, Somali M. Burgess, and Brent C. Hale, "The Costs of Obesity in the Workplace," *Journal of Occupational and Environmental Medicine* 52, no. 10 (October 2010): 971-976.

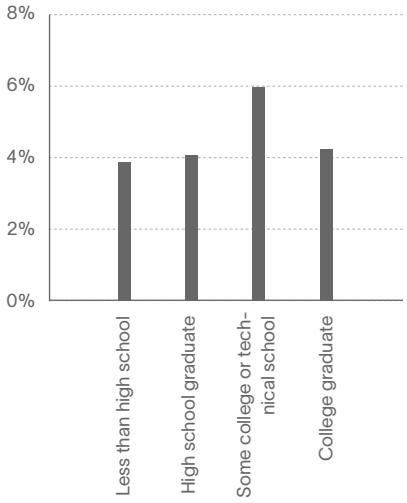
57 Ogden Cynthia L., Tala H. Fakhouri, Margaret D. Carroll, Craig M. Hales, Cheryl D. Fryar, Xianfen Li, David S. Freedman. "Prevalence of Obesity Among Adults, by Household Income and Education—United States, 2011–2014" National Center for Health Statistics, *Morbidity and Mortality Weekly Report*, 66:1369–1373 (2017).

Depression

Capturing the full economic cost of mental illness is difficult because not all mental disorders have a correlation with education. For this reason, we only examine the economic costs associated with major depressive disorder (MDD), which are comprised of medical and pharmaceutical costs, workplace costs such as absenteeism, and suicide-related costs.[58]

Figure A10.4 summarizes the prevalence of MDD among adults by education level, based on data provided by the CDC.[59] As shown, people with some college are most likely to have MDD compared to those with other levels of educational attainment. People with a high school diploma or less, along with college graduates, are all fairly similar in the prevalence rates.

Figure A10.4: Prevalence of major depressive episode by education level

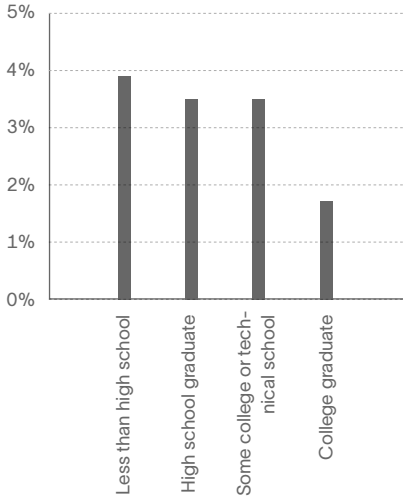


Source: National Survey on Drug Use and Health.

Drug abuse

The burden and cost of illicit drug abuse is enormous in the U.S., but little is known about the magnitude of costs and effects at a national level. What is known is that the rate of people abusing drugs is inversely proportional to their education level. The higher the education level, the less likely a person is to abuse or depend on illicit drugs. The probability that a person with less than a high school diploma will abuse drugs is 3.9%, twice as large as the probability of drug abuse for college graduates (1.7%). This relationship is presented in Figure A10.5 based on data supplied by SAMHSA.[60] Similar to alcohol abuse, prevalence does not strictly decline at every education level. Health costs associated with illegal drug use are also available from SAMSHA, with costs to state and local government representing 40% of the total cost related to illegal drug use.[61]

Figure A10.5: Prevalence of illicit drug dependence or abuse by education level



Source: Substance Abuse and Mental Health Services Administration.

Crime

As people achieve higher education levels, they are statistically less likely to commit crimes. The analysis identifies the following three types of crime-related expenses: 1) criminal justice expenditures, including police protection, judicial and legal, and corrections, 2) victim costs, and 3) productivity lost as a result of time spent in jail or prison rather than working.

58 Greenberg, Paul, Andree-Anne Fournier, Tammy Sisitsky, Crystal Pike, and Ronald Kesslaer. "The Economic Burden of Adults with Major Depressive Disorder in the United States (2005 and 2010)" *Journal of Clinical Psychiatry* 76:2, 2015.

59 National Survey on Drug Use and Health. "Table 8.40B: Major Depressive Episode (MDE) or MDE with Severe Impairment in Past Year among Persons Aged 18 or Older, and Receipt of Treatment for Depression in Past Year among Persons Aged 18 or Older with MDE or MDE with Severe Impairment in Past Year, by Geographic, Socioeconomic, and Health Characteristics: Numbers in Thousands, 2017 and 2018."

60 Substance Abuse and Mental Health Services Administration. "Table 5.3B—Illicit Drug Use Disorder in Past Year among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2017 and 2018." SAMHSA, Center for Behavioral Health Statistics and Quality, National Survey on Drug Use and Health, 2017 and 2018.

61 Substance Abuse and Mental Health Services Administration. "Table A.2. Spending by Payer: Levels and Percent Distribution for Mental Health and Substance Abuse (MHSA), Mental Health (MH), Substance Abuse (SA), Alcohol Abuse (AA), Drug Abuse (DA), and All-Health, 2014." *Behavioral Health Spending & Use Accounts, 1986–2014. HHS Publication No. SMA-16-4975*, 2016.

Figure A10.6 displays the educational attainment of the incarcerated population in the U.S. Data are derived from the breakdown of the inmate population by education level in federal, state, and local prisons as provided by the U.S. Census Bureau.[62]

Victim costs comprise material, medical, physical, and emotional losses suffered by crime victims. Some of these costs are hidden, while others are available in various databases. Estimates of victim costs vary widely, attributable to differences in how the costs are measured. The lower end of the scale includes only tangible out-of-pocket costs, while the higher end includes intangible costs related to pain and suffering.[63]

Yet another measurable cost is the economic productivity of people who are incarcerated and are thus not employed. The measurable productivity cost is simply the number of additional incarcerated people, who could have been in the labor force, multiplied by the average income of their corresponding education levels.

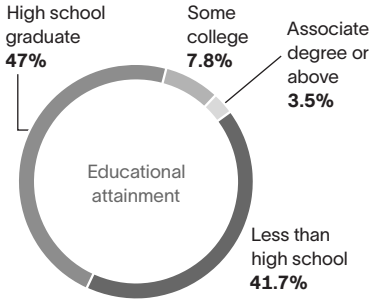
Income assistance

Statistics show that as education levels increase, the number of applicants for government-funded income assistance such as welfare and unemployment benefits declines. Welfare and unemployment claimants can receive assistance from a variety of different sources, including Temporary Assistance for Needy Families (TANF), Supplemental Nutrition Assistance Program (SNAP), Medicaid, Supplemental Security Income (SSI), and unemployment insurance.[64]

Figure A10.7 relates the breakdown of TANF recipients by education level, derived from data provided by the U.S. Department of Health and Human Services.[65] As shown, the demographic characteristics of TANF recipients are weighted heavily towards the less than high school and high school categories, with a much smaller representation of individuals with greater than a high school education.

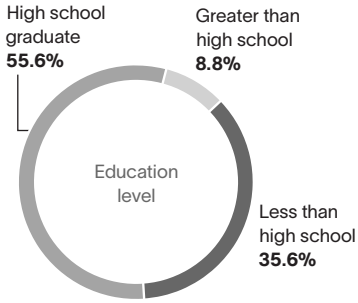
Unemployment rates also decline with increasing levels of education, as illustrated in Figure A10.8. These data are provided by the Bureau of Labor Statistics.[66] As shown, unemployment rates range from 5.4% for those with less than a high school diploma to 1.9% for those at the graduate degree level or higher.

Figure A10.6:
Educational attainment of the incarcerated population



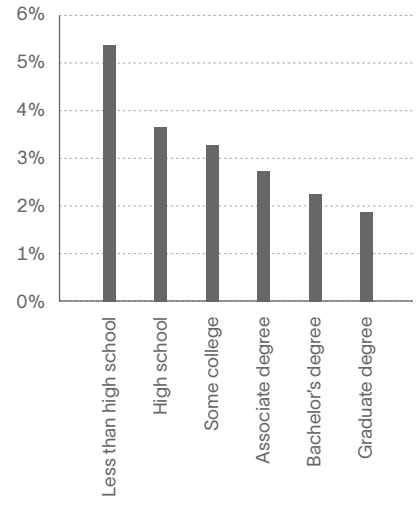
Source: Derived from data provided by the U.S. Census Bureau.

Figure A10.7:
Breakdown of TANF recipients by education level



Source: US. Department of Health and Human Services, Office of Family Assistance.

Figure A10.8: Unemployment by education level



Source: Bureau of Labor Statistics.

62 U.S. Census Bureau. "Educational Characteristics of Prisoners: Data from the ACS." 2011.

63 NMCollister, Kathryn E., Michael T. French, and Hai Fang. "The Cost of Crime to Society: New Crime-Specific Estimates for Policy and Program Evaluation." *Drug and Alcohol Dependence* 108, no. 1-2 (April 2010): 98-109.

64 Medicaid is not considered in this analysis because it overlaps with the medical expenses in the analyses for smoking, alcohol dependence, obesity, depression, and drug abuse. We also exclude any welfare benefits associated with disability and age.

65 U.S. Department of Health and Human Services, Office of Family Assistance. "Characteristics and Financial Circumstances of TANF Recipients, Fiscal Year 2018."

66 Bureau of Labor Statistics. "Table 7. Employment status of the civilian noninstitutional population 25 years and over by educational attainment, sex, race, and Hispanic or Latino ethnicity." Current Population Survey, Labor Force Statistics, Household Data Annual Averages, 2019.

Appendix B
Enrollment by Program

Northwestern Michigan College

Records Office

Contact Hours Generated
All Campuses

		Fall 2020 07-SEP-20	Fall 2021 13-SEP-21	Fall 2022 12-SEP-22	Fall 2023 11-SEP-23	Fall 2024 09-SEP-24	Pct Change
Aviation							
AVF	Aviation Flight	384	348	435	373	385	3.2%
AVG	Aviation Ground	414	478	602	617	688	11.5%
UAS	Uncrewed Aerial Systems	0	186	229	161	157	-2.5%
Academic Area Totals:		**798**	**1,012**	**1,266**	**1,151**	**1,230**	**6.9%**
Business							
ACC	Accounting	671	621	601	542	500	-7.7%
BUS	Business Administration	711	723	696	696	795	14.2%
CIT	Computer Info Technology	1,394	1,467	1,373	1,402	1,574	12.3%
CUL	Culinary Arts	1,166	1,311	1,041	1,320	1,385	4.9%
ESP	Esports	0	0	0	0	0	0.0%
MGT	Management	360	249	237	282	216	-23.4%
MKT	Marketing	232	241	210	242	196	-19.0%
Academic Area Totals:		**4,534**	**4,612**	**4,158**	**4,484**	**4,666**	**4.1%**
Communications							
ASL	American Sign Language	208	264	216	272	332	22.1%
COM	Communications	292	244	108	180	152	-15.6%
ENG	English	4,371	4,776	4,215	4,048	4,199	3.7%
FRN	French	0	0	0	0	0	0.0%
GRM	German	0	0	0	0	0	0.0%
SPN	Spanish	128	240	196	216	264	22.2%
THR	Theater	0	0	40	0	0	0.0%
Academic Area Totals:		**4,999**	**5,524**	**4,775**	**4,716**	**4,947**	**4.9%**
Construction Technology							
CAR	Carpentry	254	373	202	363	271	-25.3%
CMT	Construction Management	15	24	0	0	0	0.0%
EGY	Renewable Energy	12	36	30	45	78	73.3%
ELE	Electrician	401	394	427	426	470	10.3%
HVA	Heating and Ventilation	111	112	136	62	56	-9.7%
PLU	Plumbing	20	24	0	0	24	100.0%
Academic Area Totals:		**813**	**963**	**795**	**896**	**899**	**0.3%**
Health Occupations							
HAH	Allied Health	234	218	225	216	216	0.0%
HDA	Dental Assistant	274	260	216	135	192	42.2%
HNR	Nursing	3,044	2,793	2,949	2,829	2,701	-4.5%
HPD	Professional Development	11	10	10	8	8	5.3%
SRG	Surgical Technology	308	205	201	135	154	13.7%
Academic Area Totals:		**3,871**	**3,485**	**3,601**	**3,322**	**3,271**	**-1.6%**
Humanities							
ART	Art	867	1,067	1,241	1,204	1,262	4.8%

AUD	Audio Technology	182	200	281	336	334	-0.6%
DNC	Dance	0	8	24	32	58	81.3%
HST	History	869	848	830	707	612	-13.4%
HUM	Humanities	171	198	96	206	184	-10.7%
MUS	Music	288	402	419	514	578	12.5%
PHL	Philosophy	881	825	839	761	827	8.7%
VCA	Visual Communication Arts	388	300	320	500	564	12.8%
Academic Area Totals:		**3,646**	**3,848**	**4,050**	**4,260**	**4,419**	**3.7%**
Maritime							
MDK	Maritime-Deck	1,039	873	969	868	896	3.2%
MNG	Maritime-Engine	563	545	581	528	569	7.8%
MNS	Naval Science	112	82	98	96	108	12.5%
Academic Area Totals:		**1,714**	**1,500**	**1,648**	**1,492**	**1,573**	**5.4%**
Science & Math							
AST	Astronomy	245	220	0	245	250	2.0%
BIO	Biology	2,577	2,357	2,142	1,988	2,102	5.7%
CHM	Chemistry	843	469	714	549	530	-3.5%
EGR	Engineering	186	154	131	211	177	-16.1%
ENV	Environmental Sciences	670	635	705	475	545	14.7%
MTH	Mathematics	3,680	3,415	2,913	2,827	3,214	13.7%
PHY	Physics	613	535	520	553	594	7.4%
Academic Area Totals:		**8,814**	**7,785**	**7,125**	**6,848**	**7,412**	**8.2%**
Social Science							
ANT	Anthropology	102	162	126	123	153	24.4%
CJ	Criminal Justice	239	234	131	180	138	-23.3%
ECE	Early Childhood Education	317	469	347	353	398	12.7%
ECO	Economics	531	486	513	522	483	-7.5%
EDU	Education	141	223	212	200	249	24.5%
GEO	Geography	330	245	337	290	287	-1.0%
HAH	Allied Health	40	48	0	0	0	0.0%
LWE	Law Enforcement	220	272	135	450	540	20.0%
PLS	Political Science	363	357	360	231	273	18.2%
PSY	Psychology	1,320	1,208	1,123	1,179	1,402	18.9%
SOC	Sociology	627	579	690	630	561	-11.0%
SWK	Social Work	109	93	70	93	90	-3.2%
Academic Area Totals:		**4,339**	**4,376**	**4,044**	**4,251**	**4,574**	**7.6%**
Technical							
AT	Automotive Technology	531	636	657	611	742	21.4%
DD	Drafting and Design	135	254	168	229	197	-14.0%
EET	Electrical/Electronics Tech	270	338	246	232	293	26.3%
MFG	Manufacturing Technologies	168	210	182	118	132	11.9%
RAM	Robotics and Automation	132	180	132	136	112	-17.6%
SVR	Surveying	76	141	24	157	197	25.5%
WPT	Welding Process Technology	175	293	326	390	316	-19.0%
Academic Area Totals:		**1,487**	**2,052**	**1,735**	**1,873**	**1,989**	**6.2%**
Water Studies Institute							
WSI	Water Studies Institute	192	165	157	249	281	12.9%
Academic Area Totals:		**192**	**165**	**157**	**249**	**281**	**12.9%**

Report Totals:	**35,207**	**35,322**	**33,354**	**33,542**	**35,261**	**5.1%**

Note: This report does not include enrollment from EES sections that are cross-listed with academic sections

Digital Dashboard - Registration

Appendix C

Faculty and Staff Headcounts

ADP Report **Annual report November 1**	**2023**	**2022**	**2021**	**2020**
Category				
Faculty	**81**	82	**82**	**82**
Full Time	78	78	80	80
Part Time	3	4	2	2
NMC Administrator	**35**	35	**37**	**37**
Full Time	35	35	37	37
Part Time	0	0	0	0
Staff	**157**	150	**142**	**145**
Full Time	152	146	139	139
Part Time	5	4	3	6
Employed through Edustaff	*0*			
Maintenance/Custodial Staff	**27**	27	**28**	**29**
Full Time	27	27	28	29
Part Time	0	0	0	0
Total Regular Employees	**300**	294	**289**	**293**
Full Time	292	286	284	285
Part Time	8	8	5	8

Appendix D

Course Efficiency Reports

Northwestern Michigan College – Course Efficiency Report 2017-2023

(Note: Highlighted cells exceed 90% goal)

Fall 2017	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	262	23.82	147	11	13.36	56.11
Business	1,797	23.96	1498	75	19.97	83.36
Communications	1,944	18.87	1873	103	18.18	96.35
Construction Tech	264	14.67	165	18	9.17	62.50
Health Occupations	1022	13.81	843	74	11.39	82.49
Humanities	1,626	20.85	1372	78	17.59	84.38
Maritime	846	20.14	669	42	15.93	79.08
Physical Education	378	25.20	77	15	5.13	20.37
Science/Math	3,666	25.11	3350	146	22.95	91.38
Social Science	1,997	29.37	1657	68	24.37	82.97
Technical	680	16.19	498	42	11.86	73.24
Water Studies	82	20.50	53	4	13.25	64.63
TOTALS	14,564	21.54	12,202	676	18.05	83.78

Spring 2018	Available Seats	Avg. Max	End of Sem Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	191	23.88	148	8	18.50	77.49
Business	1692	21.97	1353	77	17.57	79.96
Communications	1502	20.30	1321	74	17.85	87.95
Construction Tech	179	14.92	125	12	10.42	69.83
Health Occupations	938	16.46	730	57	12.81	77.83
Humanities	1599	20.50	1278	78	16.38	79.92
Maritime	849	21.23	735	40	18.38	86.57
Physical Education	176	22.00	64	8	8.00	36.36
Science/Math	3091	24.93	2661	124	21.46	86.09
Social Science	2028	28.56	1594	71	22.45	78.60
Technical	587	16.31	406	36	11.28	69.17
Water Studies	86	21.50	48	4	12.00	55.81
TOTALS	12918	21.93	10463	589	17.76	81.00

Fall 2018	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	211	23.44	145	9	16.11	68.72
Business	1,680	24.00	1288	70	18.40	76.67
Communications	1,904	19.04	1788	100	17.88	93.91
Construction Tech	209	14.93	149	14	10.64	71.29
Health Occupations	1029	14.29	897	72	12.46	87.17
Humanities	1,664	20.80	1353	80	16.91	81.31
Maritime	892	20.74	725	43	16.86	81.28
Physical Education	No Courses Offered					
Science/Math	3,496	24.62	3092	142	21.77	88.44
Social Science	1,874	28.83	1619	65	24.91	86.39
Technical	520	15.29	397	34	11.68	76.35
Water Studies	78	19.50	55	4	13.75	70.51
TOTALS	13,557	21.42	11,508	633	18.18	84.89

Spring 2019	Available Seats	Avg. Max	End of Sem Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	250	25.00	144	10	14.40	57.60
Business	1586	23.67	1251	67	18.67	78.88
Communications	1541	19.76	1313	78	16.83	85.20
Construction Tech	229	14.31	161	16	10.06	70.31
Health Occupations	947	15.78	757	60	12.62	79.94
Humanities	1565	20.59	1305	76	17.17	83.39
Maritime	822	20.55	710	40	17.75	86.37
Science/Math	3068	24.54	2521	125	20.17	82.17
Social Science	1955	27.54	1590	71	22.39	81.33
Technical	488	16.27	374	30	12.47	76.64
Water Studies	90	22.50	38	4	9.50	42.22
TOTALS	12541	21.73	10164	577	17.62	81.05

Fall 2019	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	316	26.33	137	12	11.42	43.35
Business	1,589	23.72	1235	67	18.43	77.72
Communications	1,851	19.48	1631	95	17.17	88.11
Construction Tech	314	14.27	217	22	9.86	69.11
Health Occupations	1069	15.27	862	70	12.31	80.64
Humanities	1,602	20.03	1290	80	16.13	80.52
Maritime	886	20.60	690	43	16.05	77.88
Science/Math	3,562	24.07	3105	148	20.98	87.17
Social Science	2,011	28.32	1647	71	23.20	81.90
Technical	457	16.93	354	27	13.11	77.46
Water Studies	78	19.50	39	4	9.75	50.00
TOTALS	13,735	21.49	11,207	639	17.54	81.59

Spring 2020	Available Seats	Avg. Max	End of Sem Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	222	22.20	135	10	13.50	60.81
Business	1643	23.14	1181	71	16.63	71.88
Communications	1468	19.84	1209	74	16.34	82.36
Construction Tech	249	13.83	163	18	9.06	65.46
Health Occupations	1015	17.50	753	58	12.98	74.19
Humanities	1462	20.89	1177	70	16.81	80.51
Maritime	827	20.68	679	40	16.98	82.10
Science/Math	3147	24.02	2548	131	19.45	80.97
Social Science	1894	27.06	1491	70	21.30	78.72
Technical	543	16.45	380	33	11.52	69.98
Water Studies	86	21.50	34	4	8.50	39.53
TOTALS	12556	21.69	9750	579	16.84	77.65

Fall 2020	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	269	26.90	126	10	12.60	46.84
Business	1,691	22.55	1158	75	15.44	68.48
Communications	1,532	17.02	1399	90	15.54	91.32
Construction Tech	449	24.94	214	18	11.89	47.66
Health Occupations	1177	16.81	936	70	13.37	79.52
Humanities	1,515	20.20	1121	75	14.95	73.99
Maritime	847	20.17	688	42	16.38	81.23
Science/Math	3,439	24.56	2881	140	20.58	83.77
Social Science	1,751	25.75	1438	68	21.15	82.12
Technical	507	12.68	303	40	7.58	59.76
Water Studies	78	19.50	54	4	13.50	69.23
TOTALS	13,255	20.97	10,318	632	16.33	77.84

Spring 2021	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	222	27.75	135	8	16.88	60.81
Business	1467	20.10	1010	73	13.84	68.85
Communications	1174	14.68	1001	80	12.51	85.26
Construction Tech	234	15.60	148	15	9.87	63.25
Health Occupations	1076	17.93	825	60	13.75	76.67
Humanities	1556	21.61	1057	72	14.68	67.93
Maritime	884	21.56	681	41	16.61	77.04
Science/Math	2787	22.30	2193	125	17.54	78.69
Social Science	1575	23.16	1253	68	18.43	79.56
Technical	465	12.92	270	36	7.50	58.06
Water Studies	70	17.50	35	4	8.75	50.00
TOTALS	11510	19.78	8608	582	14.79	74.79

Fall 2021	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation	225	22.50	142	10	14.20	63.11
Business	1,550	21.23	1171	73	16.04	75.55
Communications	1,725	19.83	1543	87	17.74	89.45
Construction Tech	383	22.53	268	17	15.76	69.97
Health Occupations	1099	15.70	859	70	12.27	78.16
Humanities	1,781	23.75	1281	75	17.08	71.93
Maritime	889	21.17	634	42	15.10	71.32
Science/Math	3,088	22.06	2523	140	18.02	81.70
Social Science	1,646	24.21	1403	68	20.63	85.24
Technical	533	13.33	404	40	10.10	75.80
Water Studies	107	26.75	43	4	10.75	40.19
TOTALS	13,026	20.81	10,271	626	16.41	78.85

Spring 2022	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation (Adj 2022)	177	22.13	139	8	17.38	78.53
Business	1675	22.64	1116	74	15.08	66.63
Communications	1333	16.87	1151	79	14.57	86.35
Construction Tech	579	41.36	464	14	33.14	80.14
Health Occupations	1010	16.83	735	60	12.25	72.77
Humanities	1559	21.36	1051	73	14.40	67.42
Maritime	914	22.29	721	41	17.59	78.88
Science/Math	2895	22.98	2271	126	18.02	78.45
Social Science	1580	22.57	1204	70	17.20	76.20
Technical	552	15.33	327	36	9.08	59.24
Water Studies	306	76.50	256	4	64.00	83.66
TOTALS	12580	21.50	9435	585	16.13	75.00

Fall 2022	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation (AVG only)	213	21.30	175	10	17.50	82.16
Business	1574	24.22	1116	65	17.17	70.90
Communications	1480	18.50	1329	80	16.61	89.80
Construction Tech	264	16.50	216	16	13.50	81.82
Health Occupations	1125	16.54	859	68	12.63	76.36
Humanities	1674	22.62	1201	74	16.23	71.74
Maritime	795	18.93	635	42	15.12	79.87
Science/Math	3103	22.99	2477	135	18.35	79.83
Social Science	1705	26.23	1340	65	20.62	78.59
Technical	506	12.65	343	40	8.58	67.79
Water Studies	79	19.75	41	4	10.25	51.90
TOTALS	12518	20.90	9732	599	16.25	77.74

Spring 2023	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation (AVG only)	260	32.50	137	8	17.13	52.69
Business	1560	22.29	1083	70	15.47	69.42
Communications	1189	15.85	1014	75	13.52	85.28
Construction Tech	259	18.50	181	14	12.93	69.88
Health Occupations	994	17.14	699	58	12.05	70.32
Humanities	1393	19.62	1072	71	15.10	76.96
Maritime	912	22.80	611	40	15.28	67.00
Science/Math	2699	22.68	2179	119	18.31	80.73
Social Science	1623	24.97	1188	65	18.28	73.20
Technical	406	11.94	286	34	8.41	70.44
Water Studies	102	25.50	29	4	7.25	28.43
TOTALS	11397	20.42	8479	558	15.20	74.40

Fall 2023	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation (AVG only)	237	21.50	186	11	17.00	78.48
Business	1586	22.20	1189	74	16.20	74.97
Communications	1465	20.30	1320	72	18.20	90.10
Construction Tech	274	14.40	245	19	12.90	89.42
Health Occupations	1011	15.80	736	64	11.40	72.80
Humanities	1640	19.30	1268	85	14.70	77.32
Maritime	795	17.30	559	46	12.20	70.31
Science/Math	2999	22.70	2333	132	17.60	77.79
Social Science	1797	23.60	1409	78	18.30	78.41
Technical	505	15.30	0.76	33	11.50	74.46
Water Studies	125	20.80	71	6	11.80	56.80
TOTALS	12852	19.38	9871	620	14.71	76.81

Spring 2024	Available Seats	Avg. Max	Count Day Enrollment	# of Sections	Avg. Students per Section	% Full
Aviation (AVG only)	175	17.50	159	10	15.90	90.86
Business	1472	21.60	1142	68	16.80	77.58
Communications	1244	20.70	1115	60	18.60	89.63
Construction Tech	274	14.40	210	19	11.10	76.64
Health Occupations	961	16.90	648	57	11.20	67.43
Humanities	1622	20.30	1196	80	15.00	73.74
Maritime	942	20.90	717	45	16.00	76.11
Science/Math	2586	22.70	2057	114	18.00	79.54
Social Science	1534	23.00	1126	69	17.30	73.40
Technical	499	14.30	344	35	9.90	68.94
Water Studies	102	20.40	38	5	7.40	37.25
TOTALS	11766	19.34	8941	562	14.29	75.99

Appendix E
Facilities Condition Assessment

Northwestern
Michigan
College

Northwestern Michigan College
Facilities Condition Assessment
Report of Findings
November 29th, 2021

sodexo
QUALITY OF LIFE SERVICES

STOP HUNGER

Table of Contents

Disclaimer

Acknowledgements:

We would like to thank the many members of the Northwestern Michigan College community and Sodexo team members who participated in this project. Without that assistance the Facility Condition Assessment (FCA) would not have been possible. We are deeply grateful to them for their efforts. Their willingness to share both their time and expertise served to ensure the quality, utility, and extent of the data collected, information that was instrumental to the development of a tool that will assist Northwestern Michigan College in identifying its immediate needs and guide it to achieving future goals.

Report Disclaimer:

This report only describes the conditions present at the time of our inspection. It is not intended to fully delineate or document every defect or deficiency throughout the subject property. The assessor's opinion and recommendations are based on the information available and observations obtained at the time of the inspection and preparation of the report. These opinions and recommendations are made to a reasonable degree of engineering certainty. Sodexo reserves the right to amend or supplement this report if additional information becomes available. Investigation for the presence of asbestos containing materials (ACM), PCB's, CFC's, radon, and other environmentally hazardous materials is not part of this Agreement. In addition, a review and certification that the buildings have been designed to meet current seismic requirements is not part of this review.

Overview and Objectives

Overview and Background:

"Northwestern Michigan College (NMC) is a public community college in Traverse City, Michigan. Founded in 1951, it enrolls nearly 4,000 students. NMC offers associate degrees and professional certificates, bachelor's degrees through the Great Lakes Maritime Academy and Great Lakes Water Studies Institute, and bachelor's and master's degrees granted by partner universities through NMC's University Center.

NMC has a branch campus on Grand Traverse Bay that houses the Great Lakes Culinary Institute, Great Lakes Maritime Academy, Great Lakes Water Studies Institute and Hagerty Conference Center. Another branch campus near Cherry Capital Airport is home to NMC's aviation and automotive service technology programs, and offers training in manufacturing, construction, renewable energy and information technology. NMC also has an observatory (the Rogers Observatory), and a nursing program in conjunction with Munson Medical Center located at their NMC University Center Campus. " (Northwestern Michigan College)

Northwestern Michigan College partnered with Sodexo in 2006 to operate the campus' maintenance, grounds, custodial and facilities operations. As part of the Sodexo commitment to the College, we conducted a facilities assessment including 30 structures and grounds totaling approximately 850,000 square feet. The Current Replacement Value (CRV), of the buildings assessed is $204,487,000 and was supplied by the school from its insurance documents.

Objectives:

This effort was a comprehensive assessment that includes a detailed physical survey of current deficiencies and an estimate of the associated capital renewal costs. The primary objectives of this assessment were to determine the condition of the facilities, and to quantify the costs associated with continuing to maintain, repair, or replace them.

The Facilities Condition Assessment (FCA) performed for Northwestern Michigan College included an in-depth visual condition assessment survey of the college's buildings and grounds. This survey was conducted by a member of Sodexo's Asset Management and Engineering Team. The result of the field survey is a catalog of current deficiencies with direct project estimates using RS Means pricing. The RS Means pricing database is

updated annually and regionally adjusted to Traverse City, MI. Each building's current replacement value (CRV) is manually input and should be updated annually. Forecasts projecting renewal costs from component life cycles are included in the life cycle model. Together, this information resource becomes a strategic tool that allows the facility managers to quickly identify and capture deferred maintenance priorities.

Developing and maintaining a capital plan, informed, and guided by the Sodexo Facility Capital Assessment Program, will provide school leadership with the information they need to proactively address their capital project needs. The plan will help break down the overall facility needs into small and well-defined buckets that can be prioritized in a way that is consistent with the funding ability and strategic focus of the College. Establishing annual funds to address the capital, modernization, and infrastructure needs of the College are solid methodologies for strategic planning, and the result will be reduced deferred maintenance, and higher satisfaction, leading to a more competitive residential and academic program.

The key objectives of a facilities capital plan include building conditions, school priorities, and budget and priority strategies. A successful capital plan is not a static document, but rather a perpetual effort to assess and maintain the physical assets of the College to complement and enable the priorities of the institution. It is essentially a storehouse of deficiencies coupled with clear prioritization tools that form an effective and executable plan.

The strategic value of an FCA is to:

- ✓ Assess the college's buildings, identifying current and future projected deficiencies
- ✓ Reduce/mitigate risk associated with system failures
- ✓ Improve service quality and customer satisfaction (*students, faculty, and staff*)
- ✓ Lower utility, maintenance, and replacement costs
- ✓ Satisfy regulatory and compliance requirements
- ✓ Positively impact recruitment and retention

Project Scope

Methodology:

The Facilities Condition Assessment (FCA) performed for Northwestern Michigan College included a visual survey of the various facilities, a review of as-built structural drawings (when available), and historical engineering assessments and maintenance records as required with a focus on life cycle Findings in this report or the electronic data base are based on replacement in-kind and may not reflect local interpretation of federal, state and local regulations and codes. The scope of data collected, both system data and requirements (priority capital renewal/deferred maintenance projects) were based on the following criteria:

- Systems that currently exceed their BOMA expected industry life span.
- Systems that are within 5 years of their BOMA expected industry life span; and
- Systems that, regardless of age, their physical condition and/or their reported operating/maintenance history infers that they will likely need replacement within the next 5 years.

The result of the field survey is a catalog of current deficiencies tied to direct project costs in a robust database. The overall tool also catalogues the deficiencies and will forecast prioritization scenarios. This information resource becomes a strategic tool allowing facility managers to quickly identify, capture, and plan the retirement of deferred maintenance items. Further, the FCA Includes both high-level and granular levels of detail, appropriate to the need. It also gives a snapshot of the College's buildings including age, condition, predicted remaining useful life, and estimated replacement value for every component (which becomes a project).

System Analysis

All materials and equipment have a useful life, or a life cycle. This life cycle assumes that it will be installed, wear out over time, and eventually either fail or become obsolete. These costs assume the complete replacement of the system which may not be necessary. It shows the potential risk but with proper management this risk can be mitigated. As the component ages and enters the end of its useful life period, the likelihood of failures increases, and may become repetitive. A loss of efficiency and reliability will also occur.

The following tables show the building system uniformat categories. This is an important way to begin considering what types of systems are to become the priority for upcoming years and to get a better understanding of the general condition of the various types of building systems. Because NMC has four distinct campus' the reports were run to show values specific to each campus and then as a combined value for the College as a whole.

Deficiencies by System Categorized by Uniformat Code (5 Years with inflation)

Campus: Aero Park						
Uniformat and Fiscal Year	**2022**	**2023**	**2024**	**2025**	**2026**	**Summary**
B20 - Exterior Enclosure	14,216	0	0	0	0	**14,216**
B30 - Roofing	0	0	248,813	0	0	**248,813**
C10 - Interior Construction	26,034	87,749	0	0	30,181	**143,964**
C30 - Interior Finishes	8,011	0	0	0	328,669	**336,680**
D30 - HVAC System	102,224	76,107	0	611,045	205,752	**995,129**
D50 - Electrical System	36,934	2,337	14,735	0	322,603	**376,609**
G20 - Site Improvements	89,893	0	0	0	133,859	**223,753**
G40 - Site Electrical Utilities	0	0	0	0	56,740	**56,740**
Summary	**277,314**	**166,193**	**263,548**	**611,045**	**1,077,803**	**2,395,904**

Campus: Great Lakes						
Uniformat and Fiscal Year	2022	2023	2024	2025	2026	Summary
B20 - Exterior Enclosure	0	0	0	0	0	0
B30 - Roofing	0	0	0	0	0	0
C30 - Interior Finishes	71,978	0	0	0	87,989	159,966
D30 - HVAC System	0	41,350	40,109	15,528	240,595	337,582
D50 - Electrical System	24,069	0	103,072	4,959	8,015	140,116
G20 - Site Improvements	0	0	0	0	0	0
G40 - Site Electrical Utilities	28,402	0	0	0	0	28,402
Summary	124,449	41,350	143,181	20,487	336,599	666,066

Campus: Main Campus						
Uniformat and Fiscal Year	2022	2023	2024	2025	2026	Summary
B10 - Super Structure	3,376	0	107,266	0	0	110,642
B20 - Exterior Enclosure	591,880	0	449,708	44,475	30,657	1,116,720
B30 - Roofing	997,446	120,419	154,718	36,044	696,133	2,004,760
C10 - Interior Construction	481,892	1,821,207	90,381	3,786	800,761	3,198,027
C30 - Interior Finishes	1,075,768	503,704	57,967	84,892	411,784	2,134,115
D10 - Conveying	74,032	0	0	83,324	171,647	329,003
D20 - Plumbing System	29,448	6,324	0	5,849	31,555	73,176
D30 - HVAC System	1,167,574	301,459	103,276	459,505	1,327,929	3,359,744
D50 - Electrical System	2,021,998	384,616	0	271,370	678,334	3,356,317
E - Equipment and Furnishing	260,000	0	0	0	215,573	475,573
G20 - Site Improvements	102,021	5,914	6,091	327,566	90,548	532,139
G30 - Site Mechanical Utilities	4,664	4,814	0	0	1,980	11,457
G40 - Site Electrical Utilities	139,790	35,971	45,202	19,087	363,481	603,531
Summary	6,949,888	3,184,426	1,014,610	1,335,897	4,820,383	17,305,204

Building: University Center						
Uniformat and Fiscal Year	2021	2023	2024	2025	2026	Summary
B20 - Exterior Enclosure	0	0	0	0	0	0
B30 - Roofing	0	260,477	0	0	31,067	291,544
C10 - Interior Construction	0	0	0	0	587,868	587,868
C30 - Interior Finishes	237,188	103,191	0	0	56,006	396,385
D10 - Conveying	85,420	0	0	0	0	85,420
D30 - HVAC System	24,439	36,057	0	32,712	106,230	199,438
D50 - Electrical System	108,544	41,663	0	9,942	129,623	289,773
G20 - Site Improvements	4,515	0	0	0	7,586	12,101
G40 - Site Electrical Utilities	0	0	0	0	0	0
Summary	460,105	415,090	0	42,653	918,381	1,862,528

Campus: All Combined						
Uniformat and Fiscal Year	2022	2023	2024	2025	2026	Summary
B10 - Super Structure	3,376	0	107,266	0	0	110,642
B20 - Exterior Enclosure	606,096	0	449,708	44,475	30,657	1,130,936
B30 - Roofing	997,446	380,896	403,531	36,044	727,200	2,545,117
C10 - Interior Construction	507,926	1,908,956	90,381	3,786	1,418,811	3,929,859
C30 - Interior Finishes	1,392,944	606,895	57,967	84,892	884,448	3,027,146
D10 - Conveying	159,452	0	0	83,324	171,647	414,424
D20 - Plumbing System	29,448	6,324	0	5,849	31,555	73,176
D30 - HVAC System	1,299,247	425,241	143,385	1,091,927	1,805,831	4,765,630
D50 - Electrical System	2,191,546	428,616	117,806	286,270	1,138,575	4,162,814
E - Equipment and Furnishings	260,000	0	0	0	215,573	475,573
G20 - Site Improvements	196,429	5,914	6,091	327,566	231,993	767,992
G30 - Site Mechanical Utilities	4,664	4,814	0	0	1,980	11,457
G40 - Site Electrical Utilities	168,192	35,971	45,202	19,087	420,221	688,673
Summary	7,816,766	3,803,626	1,421,338	1,983,220	7,078,490	22,103,440

For each of these various summaries all future year expenditures were calculated with a 3% inflation factor.

The value of these charts is to highlight, at a high level, the types of building system capital investments that are currently due or going to become due that Northwestern Michigan College leadership should consider in creating a positive and healthy learning environment. Infrastructure investment to ensure that buildings have proper utility support is just as important as the high curb appeal that the Northwestern Michigan College grounds must demonstrate. HVAC System needs are critical for Northwestern Michigan College leadership to consider in creating a positive and healthy learning environment. Infrastructure investments to ensure that buildings have proper utility support is just as important as the high curb appeal that the school's interior construction and site improvements must demonstrate. If the planners are not careful, "invisible" systems like the roofs, boilers, chillers, and security/life safety assets will be competing with aesthetic and classroom upgrades for limited capital funds. The aesthetic priorities often win, leaving leaky roofs and inefficient or undependable heating and cooling systems or infrastructure within the buildings. These ignored projects quickly become deferred maintenance items, and their costs quickly snowball over time. Experts say that the cost of deferred maintenance if delayed can grow quickly to over four (4X) times the original repair cost. The inevitable impact on the school community, created by excessive deferred maintenance, is solid justification for strategic updating critical building components, or the failure to do so, affects the quality of life of the occupants, and therefore can impact recruitment, satisfaction, and retention.

Distribution of Requirement Categories

Each requirement or deficiency is assigned a category that indicates the general issue or the reason for the deficiency. These requirement categories were identified during the assessment and will assist in prioritizing the renewal and planning process. Additional categories are available as required. As shown below systems identified as Integrity (effecting the overall integrity of the building) represent the single biggest challenge (20% of the total) and opportunity for improvement.

Priority Criteria:

In addition to system age, the assessment's visual survey sought to identify major repairs, upgrades, and renewals anticipated within the next five years. Each requirement was assigned a priority based on when it was judged that corrective action should be performed, taken from the list in the database. A Requirement Category is the type of issue that must be addressed for a requirement. Each Requirement is assigned a category so that the issues affecting a facility can be categorized. The tables below are for the first five years as categories and priorities.

Deficiencies by Category and Priority By Campus:

Campus: Aero Park							
Category and Priority	1- Due within 1 Year of Inspection	2- Due within 2 Years of Inspection	3- Due within 3 Years of Inspection	4- Due within 4 Years of Inspection	5- Due within 5 Years of Inspection	Total	% of Total
Abandoned	0	2,203	0	0	0	2,203	0.1%
Accessibility	0	0	0	6,818	0	6,818	0.3%
Appearance	0	0	0	8,011	179,563	187,574	8.6%
Energy	54,339	56,127	0	0	13,484	123,950	5.7%
Functionality	22,934	6,776	0	166,696	36,599	233,005	10.7%
Integrity	0	0	227,699	0	0	227,699	10.5%
Lifecycle	0	4,385	0	0	160,665	165,050	7.6%
Maintenance (Optimization)	89,894	30,606	0	18,832	115,468	254,800	11.7%
Mission	0	0	0	3,485	0	3,485	0.2%
Modernization	26,034	82,712	0	0	110,203	218,949	10.1%
Regulatory / Code Compliance	65,798	0	0	0	54,035	119,833	5.5%
Reliability	0	4,450	0	357,378	273,189	635,017	29.2%
Total	258,999	187,259	227,699	561,220	943,206	2,178,383	

Campus: Great Lakes Campus							
Category and Priority	1- Due within 1 Year of Inspection	2- Due within 2 Years of Inspection	3- Due within 3 Years of Inspection	4- Due within 4 Years of Inspection	5- Due within 5 Years of Inspection	Total	% of Total
Appearance	71,976	0	0	0	75,900	**147,876**	22.4%
Energy	0	38,977	94,325	0	0	**133,302**	20.2%
Functionality	0	0	0	0	135,427	**135,427**	20.5%
Integrity	0	55,620	0	0	0	**55,620**	8.4%
Life Safety	351	0	0	0	0	**351**	0.1%
Lifecycle	28,402	0	36,705	13,796	1,973	**80,876**	12.2%
Maintenance (Optimization)	1,280	0	0	0	0	**1,280**	0.2%
Mission	0	0	0	0	70,139	**70,139**	10.6%
Regulatory / Code Compliance	14,452	0	0	0	0	**14,452**	2.2%
Reliability	9,617	0	0	4,406	6,914	**20,937**	3.2%
Total	**126,078**	**94,597**	**131,030**	**18,202**	**290,353**	**660,260**	

Campus: Main Campus							
Category and Priority	1- Due within 1 Year of Inspection	2- Due within 2 Years of Inspection	3- Due within 3 Years of Inspection	4- Due within 4 Years of Inspection	5- Due within 5 Years of Inspection	Total	% of Total
Accessibility	200,121	0	26,445	124,462	184,736	**535,764**	3.3%
Appearance	823,348	476,011	24,500	202,697	481,303	**2,007,859**	12.3%
Energy	479,718	214,688	49,695	0	30,309	**774,410**	4.8%
Functionality	542,045	129,555	20,072	426,241	680,660	**1,798,573**	11.0%
HazMat	10,291	0	0	0	0	**10,291**	0.1%
Integrity	1,437,655	203,293	0	0	1,189,915	**2,830,863**	17.4%
Life Safety	81,404	5,574	0	0	0	**86,978**	0.5%
Lifecycle	386,601	276,256	72,720	474,338	868,938	**2,078,853**	12.8%
Maintenance	0	0	0	0	43,390	**43,390**	0.3%
Maintenance (Optimization)	28,311	0	0	7,106	51,041	**86,458**	0.5%
Mission	0	0	0	0	30,479	**30,479**	0.2%
Modernization	341,130	1,519,942	0	3,364	1,080,597	**2,945,033**	18.1%
Regulatory / Code Compliance	496,517	113,829	0	88,049	11,722	**710,117**	4.4%
Reliability	936,058	100,558	51,142	213,867	799,063	**2,100,688**	12.9%
Technological Improvements	0	0	0	0	247,919	**247,919**	1.5%
Total	**5,763,199**	**3,039,706**	**244,574**	**1,540,124**	**5,700,072**	**16,287,675**	

Campus: NMC University Center						
Category and Priority	1- Due within 1 Year of Inspection	2- Due within 2 Years of Inspection	4- Due within 4 Years of Inspection	5- Due within 5 Years of Inspection	Total	% of Total
Accessibility	0	0	0	11,059	**11,059**	0.6%
Appearance	0	334,456	0	48,311	**382,767**	22.4%
Functionality	0	0	29,064	91,635	**120,699**	7.0%
Integrity	8,475	245,525	0	37,628	**291,628**	17.0%
Lifecycle	18,427	9,198	0	0	**27,625**	1.6%
Modernization	85,420	0	0	496,270	**581,690**	34.0%
Regulatory / Code Compliance	131,042	0	0	0	**131,042**	7.7%
Reliability	3,035	39,272	8,833	114,820	**165,960**	9.7%
Total	**246,399**	**628,451**	**37,897**	**799,723**	**1,712,470**	

Deficiencies by Category by Year: (ALL Campus' Combined)

Campus: All Campus' Merged							
Category and Priority	1- Due within 1 Year of Inspection	2- Due within 2 Years of Inspection	3- Due within 3 Years of Inspection	4- Due within 4 Years of Inspection	5- Due within 5 Years of Inspection	Total	% of Total
Abandoned	0	2,203	0	0	0	**2,203**	0.0%
Accessibility	200,121	0	26,445	131,280	195,795	**553,641**	2.7%
Appearance	895,324	810,467	24,500	210,708	785,077	**2,726,076**	13.1%
Energy	534,057	309,792	144,020	0	43,793	**1,031,662**	5.0%
Functionality	564,979	136,331	20,072	622,001	944,321	**2,287,704**	11.0%
HazMat	10,291	0	0	0	0	**10,291**	0.0%
Integrity	1,446,130	504,438	227,699	0	1,227,543	**3,405,810**	16.3%
Life Safety	81,755	5,574	0	0	0	**87,329**	0.4%
Lifecycle	433,430	289,839	109,425	488,134	1,031,576	**2,352,404**	11.3%
Maintenance	0	0	0	0	43,390	**43,390**	0.2%
Maintenance (Optimization)	119,485	30,606	0	25,938	166,509	**342,538**	1.6%
Mission	0	0	0	3,485	100,618	**104,103**	0.5%
Modernization	452,584	1,602,654	0	3,364	1,687,070	**3,745,672**	18.0%
Regulatory / Code Compliance	707,809	113,829	0	88,049	65,757	**975,444**	4.7%
Reliability	948,710	144,280	51,142	584,484	1,193,986	**2,922,602**	14.0%
Technological Improvements	0	0	0	0	247,919	**247,919**	1.2%
Total	**6,394,675**	**3,950,013**	**603,303**	**2,157,443**	**7,733,354**	**20,838,788**	

Percentage by Category:

Facilities Condition Index

For a facility to benchmark and measure its condition, there must be a metric for comparison. The Facility Condition Index (FCI) is a nationally and industry recognized facility management benchmark that is used to objectively assess the current condition of a building. FCI was developed by a research group working on a project sponsored by NACUBO. NACUBO asked for a written description of the facility condition assessment process, and related data analysis. The FCI is a ratio that compares the amount of deferred maintenance and capital renewal expressed in dollars, to the Current Replacement Value (CRV) of all the equipment; the higher the FCI – the poorer the condition of the assets. Not all requirement categories are included in the FCI calculation as not all systems are considered deferred maintenance items such as abandoned equipment or sustainability improvements.

Facilities Condition Index (FCI) =	$\frac{\text{Deferred Maintenance + Capital Renewal Needs}}{\text{Assets Current Replacement Value (CRV)}}$

Facility Operating Standards	FCI Range
Good	< .10
Fair	.10 to .20
Poor	.20 to .30
Critical	>.30

Requirement Categories Included in FCI		
Parent	**Category**	**Included in FCI**
Integrity	Appearance	
	Integrity	X
	Lifecycle	X
	Maintainability	X
	Reliability	X
Regulatory	Accessibility	X
	Building Code	X
	HazMat	X
	Life Safety	X
Optimization	Abandoned	
	Capacity	
	Energy	
	Maintenance	X
	Mission	X
	Sustainability	
	Technological Improvements	
Functionality	Functionality	X
	Modernization	

The primary value of the FCI metric is to provide a standard benchmark of the current condition of existing physical assets. It is very helpful in comparing facilities and prioritizing expenditures within the portfolio. The FCI is only one component for strategic planning and should not be used exclusively when determining project priority. Other factors to consider are facility profile, usage, and mission critical application. There is, however, a direct correlation between the physical appearance of the facilities and academic success.

Most facilities with FCI's above 10% and below 30% are manageable with an active strategic plan. FCI's above 30% require a very focused plan to identify the best use of resources. The goal should be to improve the FCI of all real-estate assets, which accordingly will enhance Northwestern Michigan College's competitive advantage within the industry by improving the "quality of life" for students and faculty and thereby facilitating the delivery of the Schools primary mission: *"Northwestern Michigan College provides lifelong learning opportunities to our communities."*

FCI Building Summary:

This first chart looks at FCI in a traditional alphabetical listing of assets.

Campus Name: Aero Park Campus								
Building	**Year Constructed**	**Year Last Renovated**	**Age**	**Use**	**Size**	**Replacement Value**	**FCI Cost**	**FCI**
Aero Park Campus Grounds	1960		61	SUPPORTING FACILITIES	1	12,000,000	0	0.00
Aero Park Laboratories	1980	2011	41	ACADEMIC FACILITIES	29,600	4,121,500	304,650	0.07
Automotive Technology	1990	2001	31	ACADEMIC FACILITIES	18,309	3,268,400	180,968	0.06
Aviation Building	1977		44	ACADEMIC FACILITIES	20,912	2,386,100	69,624	0.03
Parsons-Stulen/Michigan Tech Ed	1999		22	ACADEMIC FACILITIES	65,000	15,297,900	835,667	0.05
				Subtotal for Building	**133,821**	**25,073,900**	**1,390,909**	**0.06**

Campus Name: Great Lakes Campus								
Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
Great Lakes Campus	2004		17	ACADEMIC FACILITIES	75,364	21,990,100	377,803	0.02
				Subtotal for Building	**75,364**	**21,990,100**	**349,401**	**0.02**
Campus Name: Main Campus								
Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
Apartment A 1880	1973		48	RESIDENTIAL FACILITIES	12,399	2,057,266	502,886	0.24
Apartment B 1882	1973		48	RESIDENTIAL FACILITIES	12,399	1,740,200	562,005	0.32
Apartment C 1884	1973		48	RESIDENTIAL FACILITIES	12,399	1,740,200	530,000	0.30
Appel Property	1954		67	SUPPORTING FACILITIES	1,160	153,200	5,610	0.04
Athletic Fields	1976		45	SUPPORTING FACILITIES	1	55,000	31,250	0.57
Biederman Building	1976	2002	45	ACADEMIC FACILITIES	28,441	8,818,956	1,039,650	0.12
Campus General	1961		60	SUPPORTING FACILITIES	1	7,000,000	755,165	0.11
Dennos Museum Center	1991	2019	30	SUPPORTING FACILITIES	53,545	17,332,700	341,944	0.02
East Hall	1965	1999	56	RESIDENTIAL FACILITIES	52,288	11,990,600	271,801	0.02
Facilities Maintenance Building	2001		20	SUPPORTING FACILITIES	11,900	1,052,100	24,292	0.02
Fine Arts	1971	2000	50	ACADEMIC FACILITIES	18,800	4,843,500	390,997	0.08
Founders Hall	1976	2003	45	OFFICE FACILITIES	4,950	1,170,200	174,688	0.15
Health and Science Building	2002		19	ACADEMIC FACILITIES	57,477	17,463,812	486,309	0.03
James J. Beckett	1996		25	ACADEMIC FACILITIES	34,269	8,164,100	372,337	0.05
North Hall	2017		4	RESIDENTIAL FACILITIES	46,730	6,818,200	0	0.00
Oleson Center	1978	2006	43	SUPPORTING FACILITIES	9,925	2,506,400	122,539	0.05
Osterlin Building	1960	2002	61	ACADEMIC FACILITIES	46,734	12,068,600	2,106,875	0.17
Power House	1962		59	SUPPORTING FACILITIES	3,625	2,128,300	574,542	0.27
Rajkovich Physical Education	1969		52	ATHLETIC FACILITIES	25,674	5,053,068	1,013,391	0.20
Rogers Observatory	1981		40	ACADEMIC FACILITIES	1,624	398,600	0	0.00
Scholars Hall	1962	2003	59	ACADEMIC FACILITIES	62,812	15,495,300	389,322	0.03
Tanis Building	1957	2003	64	OFFICE FACILITIES	14,300	4,344,912	456,368	0.11
Utility Tunnels	1970		51	SUPPORTING FACILITIES	6,925	1,924,000	0	0.00
West Hall	1965	2020	56	SUPPORTING FACILITIES	63,254	9,596,500	74,032	0.01
				Subtotal for Building	**581,632**	**143,915,714**	**10,226,002**	**0.07**
Campus Name: NMC University Center								
Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
University Center	1986	1994	35	ACADEMIC FACILITIES	59,460	13,507,600	748,013	0.06
				Subtotal for Building	**59,460**	**13,507,600**	**748,013**	**0.06**
				Grand Totals	**850,277**	**204,487,314**	**12,714,326**	**0.06**

The FCI values highlighted are those over 20% which would typically require a very focused plan to identify that asset's best plan of action**, however regarding the Power House the value of the equipment within the building vs the value of the builidng itself is disproportionate. And similarly, the "Athletic Fields" the value of the fields themselves is so low most any improvements makes the ratio disproportionately high**. These values did not skew the campus' overall FCI value by much as the fields only comprise .4% of the gross value of campus. Additionally, the FCI value for the TEC is currently at almost 100% as the canvas material that is the primary building component is nearing its lifecycle and tears have started appearing at the West end.

The next chart shows the buildings listed from highest to lowest FCI Cost. This ranks the buildings/assets that need the most attention or long-term capital planning.

Building FCI Listed by FCI (Highest to Lowest)

Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
Campus Name: Aero Park Campus								
Aero Park Laboratories	1980	2011	41	ACADEMIC FACILITIES	29,600	4,121,500	304,650	0.07
Automotive Technology	1990	2001	31	ACADEMIC FACILITIES	18,309	3,268,400	180,968	0.06
Parsons-Stulen/Michigan Tech Ed	1999		22	ACADEMIC FACILITIES	65,000	15,297,900	835,667	0.05
Aviation Building	1977		44	ACADEMIC FACILITIES	20,912	2,386,100	69,624	0.03
Aero Park Campus Grounds	1960		61	SUPPORTING FACILITIES	1	12,000,000	0	0.00
				Subtotal for Building	**104,222**	**32,952,400**	**1,086,259**	**0.03**
Campus Name: Great Lakes Campus								
Great Lakes Campus	2004		17	ACADEMIC FACILITIES	75,364	21,990,100	377,803	0.02
				Subtotal for Building	**75,364**	**21,990,100**	**349,401**	**0.02**
Campus Name: Main Campus								
Athletic Fields	1976		45	SUPPORTING FACILITIES	1	55,000	31,250	0.57
Apartment B 1882	1973		48	RESIDENTIAL FACILITIES	12,399	1,740,200	562,005	0.32
Apartment C 1884	1973		48	RESIDENTIAL FACILITIES	12,399	1,740,200	530,000	0.30
Power House	1962		59	SUPPORTING FACILITIES	3,625	2,128,300	574,542	0.27
Apartment A 1880	1973		48	RESIDENTIAL FACILITIES	12,399	2,057,266	502,886	0.24
Rajkovich Physical Education	1969		52	ATHLETIC FACILITIES	25,674	5,053,068	1,013,391	0.20
Osterlin Building	1960	2002	61	ACADEMIC FACILITIES	46,734	12,068,600	2,106,875	0.17
Founders Hall	1976	2003	45	OFFICE FACILITIES	4,950	1,170,200	174,688	0.15
Biederman Building	1976	2002	45	ACADEMIC FACILITIES	28,441	8,818,956	1,039,650	0.12
Campus General	1961		60	SUPPORTING FACILITIES	1	7,000,000	755,165	0.11
Tanis Building	1957	2003	64	OFFICE FACILITIES	14,300	4,344,912	456,368	0.11
Fine Arts	1971	2000	50	ACADEMIC FACILITIES	18,800	4,843,500	390,997	0.08
Oleson Center	1978	2006	43	SUPPORTING FACILITIES	9,925	2,506,400	122,539	0.05
James J. Beckett	1996		25	ACADEMIC FACILITIES	34,269	8,164,100	372,337	0.05
Appel Property	1954		67	SUPPORTING FACILITIES	1,160	153,200	5,610	0.04
Health and Science Building	2002		19	ACADEMIC FACILITIES	57,477	17,463,812	486,309	0.03
Scholars Hall	1962	2003	59	ACADEMIC FACILITIES	62,812	15,495,300	389,322	0.03
Facilities Maintenance Building	2001		20	SUPPORTING FACILITIES	11,900	1,052,100	24,292	0.02
East Hall	1965	1999	56	RESIDENTIAL FACILITIES	52,288	11,990,600	271,801	0.02
Dennos Museum Center	1991	2019	30	SUPPORTING FACILITIES	53,545	17,332,700	341,944	0.02
West Hall	1965	2020	56	SUPPORTING FACILITIES	63,254	9,596,500	74,032	0.01
North Hall	2017		4	RESIDENTIAL FACILITIES	46,730	6,818,200	0	0.00
Rogers Observatory	1981		40	ACADEMIC FACILITIES	1,624	398,600	0	0.00
Utility Tunnels	1970		51	SUPPORTING FACILITIES	6,925	1,924,000	0	0.00
				Subtotal for Building	**581,632**	**143,915,714**	**10,226,002**	**0.07**
Campus Name: NMC University Center								
University Center	1986	1994	35	ACADEMIC FACILITIES	59,460	13,507,600	748,013	0.06
				Subtotal for Building	**59,460**	**13,507,600**	**748,013**	**0.06**
				Grand Totals	**820,678**	**212,365,814**	**12,409,676**	**0.06**

The third chart shows the asset listed sorted by building usage type.

ACADEMIC BUILDINGS								
Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
Osterlin Building	1960	2002	61	ACADEMIC FACILITIES	46,734	12,068,600	2,106,875	0.17
Biederman Building	1976	2002	45	ACADEMIC FACILITIES	28,441	8,818,956	1,039,650	0.12
Fine Arts	1971	2000	50	ACADEMIC FACILITIES	18,800	4,843,500	390,997	0.08
Aero Park Laboratories	1980	2011	41	ACADEMIC FACILITIES	29,600	4,121,500	304,650	0.07
University Center	1986	1994	35	ACADEMIC FACILITIES	59,460	13,507,600	748,013	0.06
Automotive Technology	1990	2001	31	ACADEMIC FACILITIES	18,309	3,268,400	180,968	0.06
Parsons-Stulen/Michigan Tech Ed	1999		22	ACADEMIC FACILITIES	65,000	15,297,900	835,667	0.05
James J. Beckett	1996		25	ACADEMIC FACILITIES	34,269	8,164,100	372,337	0.05
Aviation Building	1977		44	ACADEMIC FACILITIES	20,912	2,386,100	69,624	0.03
Health and Science Building	2002		19	ACADEMIC FACILITIES	57,477	17,463,812	486,309	0.03
Scholars Hall	1962	2003	59	ACADEMIC FACILITIES	62,812	15,495,300	389,322	0.03
Great Lakes Campus	2004		17	ACADEMIC FACILITIES	75,364	21,990,100	377,803	0.02
Rogers Observatory	1981		40	ACADEMIC FACILITIES	1,624	398,600	0	0.00
				Subtotal	518,802	127,824,468	7,302,216	0.06
RESIDENTIAL BUILDINGS								
Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
Apartment B 1882	1973		48	RESIDENTIAL FACILITIES	12,399	1,740,200	562,005	0.32
Apartment C 1884	1973		48	RESIDENTIAL FACILITIES	12,399	1,740,200	530,000	0.30
Apartment A 1880	1973		48	RESIDENTIAL FACILITIES	12,399	2,057,266	502,886	0.24
East Hall	1965	1999	56	RESIDENTIAL FACILITIES	52,288	11,990,600	271,801	0.02
North Hall	2017		4	RESIDENTIAL FACILITIES	46,730	6,818,200	0	0.00
				Subtotal	136,215	24,346,466	1,866,692	0.08
SUPPORTING BUILDINGS								
Building	Year Constructed	Year Last Renovated	Age	Use	Size	Replacement Value	FCI Cost	FCI
Athletic Fields	1976		45	SUPPORTING FACILITIES	1	55,000	31,250	0.57
Power House	1962		59	SUPPORTING FACILITIES	3,625	2,128,300	574,542	0.27
Rajkovich Physical Education	1969		52	SUPPORTING FACILITIES	25,674	5,053,068	1,013,391	0.20
Founders Hall	1976	2003	45	SUPPORTING FACILITIES	4,950	1,170,200	174,688	0.15
Campus General	1961		60	SUPPORTING FACILITIES	1	7,000,000	755,165	0.11
Tanis Building	1957	2003	64	SUPPORTING FACILITIES	14,300	4,344,912	456,368	0.11
Oleson Center	1978	2006	43	SUPPORTING FACILITIES	9,925	2,506,400	122,539	0.05
Appel Property	1954		67	SUPPORTING FACILITIES	1,160	153,200	5,610	0.04
Facilities Maintenance Building	2001		20	SUPPORTING FACILITIES	11,900	1,052,100	24,292	0.02
Dennos Museum Center	1991	2019	30	SUPPORTING FACILITIES	53,545	17,332,700	341,944	0.02
West Hall	1965	2020	56	SUPPORTING FACILITIES	63,254	9,596,500	74,032	0.01
Aero Park Campus Grounds	1960		61	SUPPORTING FACILITIES	1	12,000,000	0	0.00
Utility Tunnels	1970		51	SUPPORTING FACILITIES	6,925	1,924,000	0	0.00
				Subtotal	195,261	64,316,380	3,573,821	0.06

Using the above data for Northwestern Michigan College the cumulative FCI percentage for the campus is 6% which is in the “Good” category. Going forward it is recommended that building envelopes continue to be prioritized in order to maintain building integrity from degrading. From looking at the average FCI’s by building usage type the Residential buildings look like they are in most need of focus at a cumulative 8% but also the Apartments standing out the most.

It is generally best to use the FCI’s as an internal comparison of relative condition and a guide for the best approach for corrective action. However, for external comparisons we see facilities like Northwestern Michigan College having FCI’s ranging between 10% and 20%. NMC has been doing a great job of keeping their building conditions in good shape and staying below the average FCI range.

Most facilities with FCI’s above 10% and below 30% are manageable with an active strategic plan. FCI’s above 30% require a very focused plan to identify the best use of resources. The goal should be to improve the FCI of all real-estate assets, which accordingly will enhance Northwestern Michigan College’s competitive advantage within the industry by improving the “quality of life” for students, faculty and staff.

Requirement Investment by Year

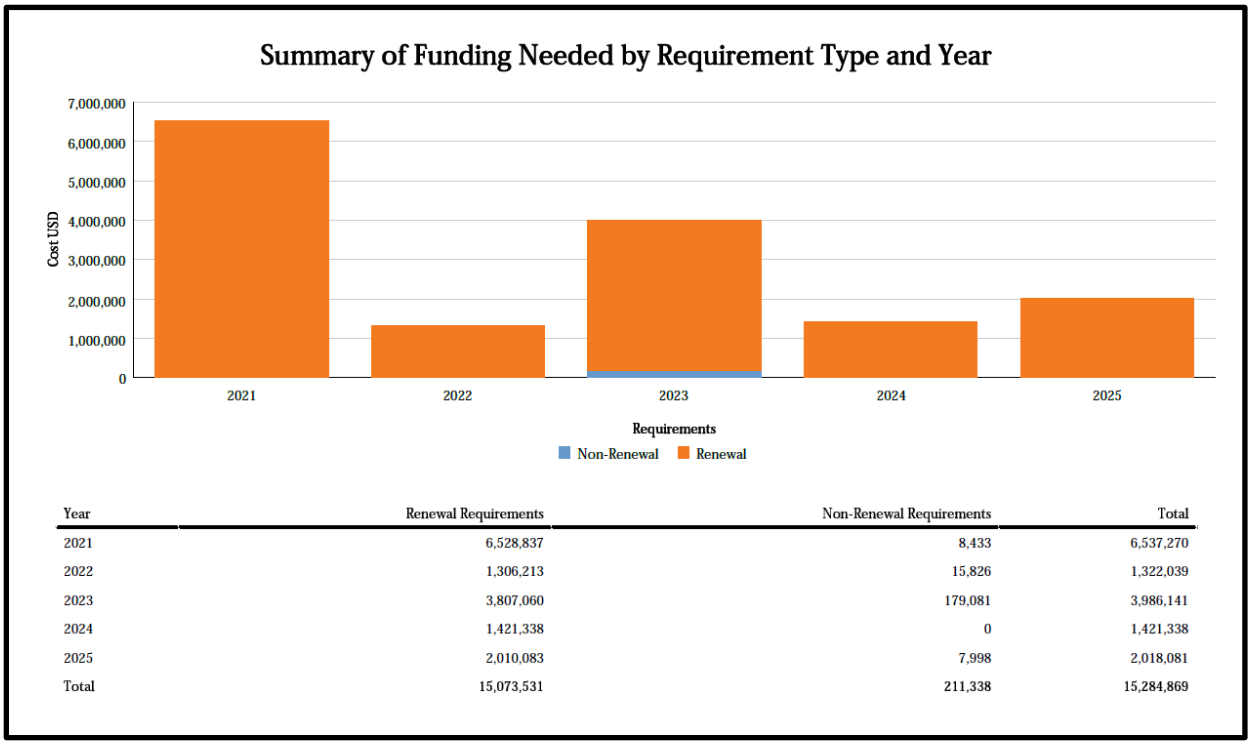
The five-year action plan reflects an investment horizon that identifies critical infrastructural and facility investments. Given the current economic state of many institutions today this plan can be extended to accommodate funding availability. No Institution is operating without a deferred maintenance backlog. The goal of what is being shown here is NOT to get to zero. The goal is to plan out specific improvements.

Developing a clear, concise, and comprehensive capital action plan is not a simple task. Each component of diverse school infrastructure has distinctive maintenance necessities. That is why Sodexo takes the time to understand those necessities and provide the critical information to create the perfect strategic approach for integrating the unique composite of systems and structures.

Our knowledge and expertise allow our partners more control of their fiscal future. By providing a living instrument to track and maintain existing assets, we offer the stakeholders the ability to target their efforts and optimize the results through the evaluation of existing conditions, a five-year management plan to reduce existing and future deferred maintenance conditions.

The annual totals reflected below are estimates based on like replacement costs and can easily be adjusted to actively manage the data base and create a historical register of completed projects. The priority years may also be adjusted to best align with Northwestern Michigan College's budget, mission, and strategic plan. The data is with the use of the software tools should be evaluated annually to maintain an active budgeting tool.

Summary of Funding Needs:



Year	Renewal Requirements	Non-Renewal Requirements	Total
2021	6,528,837	8,433	6,537,270
2022	1,306,213	15,826	1,322,039
2023	3,807,060	179,081	3,986,141
2024	1,421,338	0	1,421,338
2025	2,010,083	7,998	2,018,081
Total	15,073,531	211,338	15,284,869

Capital Renewal Funding Options

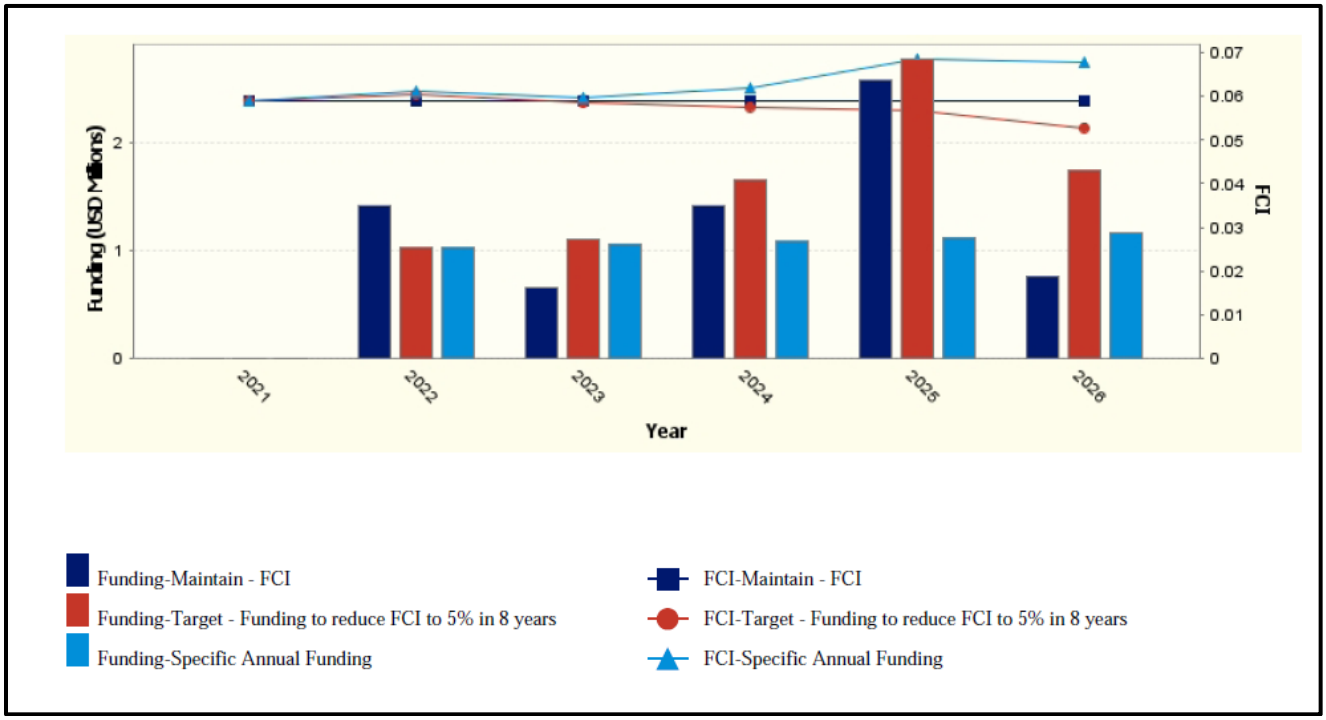
Systems that have exceeded their life cycle are likely compromised. When replacing compromised critical infrastructure components quite often the corresponding equipment must also be replaced which increases the overall cost of the project.

Using the Northwestern Michigan College asset data and the funding module within VFA Facility we can examine various funding strategies, analyze their fiscal implications over various time periods, and project the impact of deferred maintenance, either for individual assets, or across the entire assessed portfolio. Values, either assumed or measured, and different time ranges, can be modeled with the funding module for analysis purposes, to see their cost implications and to project their impact on facility conditions.

To show the analysis potential of VFA Facility, note the three examples summarized below, illustrating the varying costs and condition impacts those different strategies can produce. For these examples, the costs for annual system renewals reflect an annual inflation rate of 3% (today's dollars) over the time examined with a 2% deterioration backlog. The scenarios shown below are samples of funding options. With the VFA Facility software we can produce additional options to match Northwestern Michigan College's mission, values, and available budget.

These are samples of three 5-year Funding scenarios:

Funding/FCI Graph:



Maintain - FCI

Cost Curve Applied: Spiky 0

Year	Replacement Cost	Renewal Cost	Backlog Deterioration	Total New Liability	New Backlog Total	Net Plant Value	Funding	Funding Reserve	FCI
2021	216,487,314	12,586,810	0	12,742,729	12,742,729	203,744,585	0	0	0.0589
2022	222,981,928	1,157,833	262,500	1,420,333	13,125,011	209,856,917	1,420,333	0	0.0589
2023	229,671,379	382,479	270,375	652,854	13,518,761	216,152,619	652,854	0	0.0589
2024	236,561,514	1,141,698	278,486	1,420,185	13,924,323	222,637,191	1,420,185	0	0.0589
2025	243,658,353	2,293,541	286,841	2,580,382	14,342,052	229,316,300	2,580,382	0	0.0589
2026	250,968,096	471,858	295,446	767,305	14,772,314	236,195,783	767,305	0	0.0589

Target - Funding to reduce FCI to 4.5% in 8 years

Cost Curve Applied: Spiky 0

Year	Replacement Cost	Renewal Cost	Backlog Deterioration	Total New Liability	New Backlog Total	Net Plant Value	Funding	Funding Reserve	FCI
2021	216,487,314	12,586,810	0	12,742,729	12,742,729	203,744,585	0	0	0.0589
2022	222,981,928	1,157,833	262,500	1,420,333	13,063,421	209,918,506	1,481,922	0	0.0586
2023	229,671,379	382,479	269,106	651,585	12,990,315	216,681,064	1,116,593	0	0.0566
2024	236,561,514	1,141,698	267,600	1,409,299	13,003,107	223,558,407	1,786,216	0	0.0550
2025	243,658,353	2,293,541	267,864	2,561,405	13,183,362	230,474,990	2,771,243	0	0.0541
2026	250,968,096	471,858	271,577	743,436	12,546,285	238,421,811	1,776,013	0	0.0500

Specific Annual Funding

Cost Curve Applied: Spiky 0

Year	Replacement Cost	Renewal Cost	Backlog Deterioration	Total New Liability	New Backlog Total	Net Plant Value	Funding	Funding Reserve	FCI
2021	216,487,314	12,586,810	0	12,742,729	12,742,729	203,744,585	0	0	0.0589
2022	222,981,928	1,157,833	262,500	1,420,333	13,615,927	209,366,001	1,030,000	100,583	0.0611
2023	229,671,379	382,479	280,488	662,967	13,743,354	215,928,025	1,060,900	220,484	0.0598
2024	236,561,514	1,141,698	283,113	1,424,812	14,642,887	221,918,627	1,092,727	382,246	0.0619
2025	243,658,353	2,293,541	301,643	2,595,184	16,711,651	226,946,702	1,125,509	553,515	0.0686
2026	250,968,096	471,858	344,260	816,118	17,034,440	233,933,656	1,159,274	734,717	0.0679

To avoid adding additional deferred maintenance, capital renewal projects should be funded with increasing or decreasing overall campus backlog in mind. Based on standard system life cycle calculations the recommended **annual minimum** renewal budget for Northwestern Michigan College would be an average of $1,786,397. Funding below this level will cause the deferred maintenance backlog to continue to grow and could create operational and client satisfaction and retention issues going forward. More critical than the FCI reduction is this will allow Northwestern Michigan College to address deferred maintenance before it becomes more difficult to manage.

There are many options in looking at ways to address this challenge. Our team would welcome the opportunity to work with Northwestern Michigan College's leadership to explore possible scenarios. Unfortunately, several of these buildings are approaching an age where an increase in funding for deferred maintenance will be necessary. This is not unique to Northwestern Michigan College as we see it in aging asset portfolios across most markets. Without a specific plan most annual operating budgets do not adequately support the growing need to fund deferred maintenance.

As projects are planned additional focus should be placed on the exterior shell of the buildings (aged roofs, windows, masonry), indoor air quality and interior finishes of your facilities. More specific recommendations are included as an Appendix to this report.

The capital renewal allowance does not include funding for deferred maintenance backlogs and is usually applicable to facilities with a manageable backlog. Deferred maintenance backlog reduction involving a substantial amount of work may require a high level of funding in the initial years of a multi-year capital plan to reduce backlogs to a desired level.

This five-year action plan should be used as a proactive tool to manage Northwestern Michigan College's capital project needs. The report distributes projects in varying amounts for each year based on project priority and justification. The costs developed in the report are budgetary estimates and may fluctuate based on project scope, materials, and bidding process.

Common Facilities Maintenance Acronyms

AC – Air Conditioning
AHU – Air Handling Unit
BAS – Building Automation System
CRV – Current Replacement Value
DDC – Direct Digital Control
EMS - Energy Management System
FCI – Facility Condition Index
FCU – Fan Coil Unit
FM - Facilities Management
HID Lighting – High Intensity Discharge
HVAC – Heating, Ventilation and Air Conditioning
LED lighting – Light Emitting Diode
MEP - Mechanical, Electrical and Plumbing
PM - Preventive Maintenance

Appendix

Recommended Projects:

Based on the Assessors observations and not a specific budget or mission critical needs the following projects should have priority. Specific detailed reports are attached.

1. 5 Year Plan By Building By Year
2. Funding Scenarios Report
3. Roof Replacements
4. Sample Building Detail Report

Works Cited

Wikipedia contributors. "Northwestern Michigan College." *Wikipedia, The Free Encyclopedia*. Wikipedia, The Free Encyclopedia, 14 Dec. 2020. Web. 5 Nov. 2021.

Appendix F

Summary of Facilities and Square Footage

SCHEDULE OF BUILDINGS & CONTENTS

(Period: 7/1/2024 through 7/1/2025)

Northwestern Michigan College

	Last Year Totals:		**Buidings**	$ 272,138,200	**Contents**	$ 25,141,384	**Building + Contents**	$ 297,279,584	
	Current Year Totals:		**Buidings**	**$ 294,034,200**	**Contents**	**$ 27,799,158**	**Building + Contents**	**$ 321,833,358**	

Location#	Location Description	Last Year Building Value	Last Year Contents	Last Year Total Value	Last Year Square Ft	New Building Value	New Contents Value	New Total Value	New Square Ft
	Main Campus (1701 E. Front St., Traverse City, MI 49686)								
1	Tanis/Beiderman/ISTLC	40,408,200	2,594,196	43,002,396	105,519	43,641,800	**2,723,906**	46,365,706	105,519
2	Apartments A	2,365,000	42,972	2,407,972	12,399	2,554,000	**45,121**	2,599,121	12,399
2B	Apartment B	2,365,000	42,972	2,407,972	12,399	2,554,000	**45,121**	2,599,121	12,399
2C	Apartment C	2,365,000	42,972	2,407,972	12,399	2,554,000	**45,121**	2,599,121	12,399
6	Founders Hall	1,553,500	80,330	1,633,830	4,950	1,677,900	**84,347**	1,762,247	4,950
7	East Residence Hall	15,861,300	2,656,571	18,517,871	52,288	17,130,300	**3,432,046**	20,562,346	52,288
8	Fine Arts Building	6,400,800	166,098	6,566,898	18,800	6,913,000	**212,133**	7,125,133	18,800
10	Osterlin Library	15,973,600	3,962,994	19,936,594	46,734	17,251,600	**4,161,144**	21,412,744	46,734
13	Museum - Auditorium	22,902,900	685,152	23,588,052	55,085	24,735,100	**872,071**	25,607,171	55,085
15	Oleson Center	3,326,600	73,281	3,399,881	10,398	3,592,700	**76,945**	3,669,645	10,398
16	Physical Education	7,442,100	91,855	7,533,955	25,674	8,037,300	**96,448**	8,133,748	25,674
17	Powerhouse	2,807,800	17,421	2,825,221	3,580	3,032,500	**18,292**	3,050,792	3,580
18	Scholars Hall	20,473,100	109,289	20,582,389	62,812	22,111,000	**114,753**	22,225,753	62,812
19	Timothy J. Nelson Innovation Center	23,097,200	3,317,234	26,414,434	66,304	24,945,200	**3,483,096**	28,428,296	66,304
22	Utility Tunnels	2,538,400	-	2,538,400	6,925	2,741,500	**-**	2,741,500	6,925
26	Beckett	10,812,000	498,576	11,310,576	34,269	11,676,900	**523,505**	12,200,405	34,269
46	Maintenance	1,350,000	660,186	2,010,186	11,900	1,457,900	**732,990**	2,190,890	11,900
47	Landscape Bin	40,600	-	40,600	675	43,900	**-**	43,900	675
51	North Hall (student housing)	9,055,800	88,170	9,143,970	46,730	9,780,200	**92,579**	9,872,779	46,730
	Subtotal (Main Campus):	$ 191,138,900	$ 15,130,269	$ 206,269,169	589,840	**$ 206,430,800**	**$ 16,759,618**	**$ 223,190,418**	**589,840**
	Appel Biology (1891 Sarns Road, Traverse City, MI 49696)								
3	Appel Biology	202,000	-	202,000	1,160	218,400	**-**	218,400	1,160
	Subtotal (Appel Biology):	$ 202,000	$ -	$ 202,000	1,160	**$ 218,400**	**$ -**	**$ 218,400**	**1,160**
	Eastern Avenue Apartment Storage (2005 Eastern Avenue, Traverse City, MI 49686)								
23	Eastern Avenue Apartment Storage	76,000	-	76,000	1,344	82,300	**-**	82,300	1,344
	Subtotal (Eastern Avenue Apartment Storage):	$ 76,000	$ -	$ 76,000	1,344	**$ 82,300**	**$ -**	**$ 82,300**	**1,344**
	Great Lakes Campus (715 E Front Street)								
49	Great Lakes Campus	29,063,200	3,669,220	32,732,420	75,364	31,383,800	**4,332,739**	35,716,539	75,364
	Subtotal (Great Lakes Campus):	$ 29,063,200	$ 3,669,220	$ 32,732,420	75,364	**$ 31,383,800**	**$ 4,332,739**	**$ 35,716,539**	**75,364**
	NMC University Center (2200 Dendrinos Drive, Traverse City, MI 49686)								
20	University Center Campus	17,871,900	400,306	18,272,206	59,460	19,430,000	**420,321**	19,850,321	59,460
	Subtotal (University Center Capus):	$ 17,871,900	$ 400,306	$ 18,272,206	59,460	**$ 19,430,000**	**$ 420,321**	**$ 19,850,321**	**59,460**
	Aero Park Campus (2600 Aero Park Drive, Traverse City, MI 49686)								
5	Aviation	3,178,000	957,621	4,135,621	20,912	3,432,200	**1,005,502**	4,437,702	20,912
45	Parsen - Stullen M-TEC	20,271,700	2,625,594	22,897,294	65,000	21,893,300	**2,756,874**	24,650,174	65,000
50	Aero Park Lab	5,468,100	1,984,103	7,452,203	29,600	5,905,400	**2,131,119**	8,036,519	29,600
48	Automotive Service Tech	4,332,800	296,699	4,629,499	18,328	4,679,500	**311,534**	4,991,034	18,328
	Subtotal (Aero Park Campus):	$ 33,250,600	$ 5,864,017	$ 39,114,617	133,840	**$ 35,910,400**	**$ 6,205,029**	**$ 42,115,429**	**133,840**
	Rogers Observatory (1753 Brimley Rd., Traverse City, MI 49686)								
14	Observatory	535,600	77,572	613,172	1,624	578,500	**81,451**	659,951	1,624
	Subtotal (Observatory):	535,600	77,572	613,172	1,624	**578,500**	**81,451**	**659,951**	**1,624**
	Totals:	$ 272,138,200	$ 25,141,384	$ 297,279,584	862,632	**$ 294,034,200**	**$ 27,799,158**	**$ 321,833,358**	**862,632**

Appendix G

Building and Classroom Utilization

Location Utilization Summary

Based on events from 12:00 A.M. to 11:45 P.M., between Aug 15 2023 and May 15 2024. There are 6,531.25 total hours in the report period, (K).

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
AL - ENTIRE SHOP (NO SPACES)	536			No events found						
AL 101	16		0.00	6,531.25	456.50	3,895.00	6.99%	53.57%	3.73%	0.26%
AL 102	24		0.00	6,531.25	557.42	8,807.42	8.53%	66.67%	5.62%	0.48%
AL 103	13			No events found						
AL 106	16			No events found						
AL 110A	16		0.00	6,531.25	350.50	1,921.00	5.37%	32.29%	1.84%	0.1%
AL 110B	20		0.00	6,531.25	469.00	4,328.00	7.18%	46.25%	3.31%	0.24%
AL 118	20		0.00	6,531.25	546.32	7,023.88	8.36%	63.33%	5.38%	0.45%
AL 122	20			No events found						
AL A	20		0.00	6,531.25	801.00	7,646.33	12.26%	47.27%	5.85%	0.72%
AL A/B	40			No events found						
AL A/B/C	60			No events found						
AL A/B/C/D	80			No events found						
AL B	20		0.00	6,531.25	6.67	53.33	0.1%	40%	0.04%	0%
AL B/C	40			No events found						
AL B/C/D	60			No events found						
AL BLDG (NO SPACES)	0			No events found						
AL C	20			No events found						
AL C/D	40			No events found						
AL D	20			No events found						
AL E	20			No events found						
AL E/F	40			No events found						
AL E/F/G	60			No events found						
AL E/F/G/H	80			No events found						
AL F	20			No events found						
AL F/G	40			No events found						
AL F/G/H	60			No events found						
AL G	20			No events found						
AL G/H	40			No events found						
AL H	20			No events found						
AL I	20			No events found						
AL I/J	40			No events found						

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
AL J	20			No events found						
AL K	20			No events found						
AL L	24			No events found						
APPEL	45			No events found						
ARR ROOM	999		0.00	6,531.25	1,223.10	65,663.50	18.73%	1.07%	1.01%	0.19%
AT 100	18		0.00	6,531.25	352.00	4,886.00	5.39%	77.78%	4.16%	0.22%
AT 102	18			No events found						
AT 104	18			No events found						
AT 108	18		0.00	6,531.25	799.00	8,749.00	12.23%	59.03%	7.44%	0.91%
AT 111	18		237.25	6,294.00	420.00	6,420.00	6.67%	87.5%	5.67%	0.38%
AT BLDG (NO SPACES)	0			No events found						
BFC GYM	500			No events found						
BIK STUDIO	50			No events found						
CC POOL	500			No events found						
CITY OPERA HOUSE	0			No events found						
CTC BLDG	999		0.00	6,531.25	400.50	600.75	6.13%	0.15%	0.01%	0%
DMC 101	30		0.00	6,531.25	286.83	5,084.25	4.39%	52.59%	2.59%	0.11%
DMC BINSFELD GALLERY	50			No events found						
DMC CONFERENCE ROOM	12			No events found						
DMC DISCOVERY GALLERY	100			No events found						
DMC DUTMERS THEATER	34			No events found						
DMC GALLERIES	250			No events found						
DMC INUIT GALLERY	50			No events found						
DMC JANIS ROOM	75			No events found						
DMC MACFARLANE GALLERY	200			No events found						
DMC MILLIKEN	400		0.00	6,531.25	240.17	4,740.75	3.68%	11.11%	0.18%	0.01%
DMC MUSEUM CENTER	500			No events found						
DMC PARKING LOT	999			No events found						
DMC SCHMUCKAL GALLERY	150			No events found						
DMC SCULPTURE COURT	300			No events found						
ED SERVICES RECEPTION AREA T 55	0			No events found						
F - MUSIC WING	0			No events found						
F 102	49		0.00	6,531.25	417.75	5,896.00	6.4%	17.57%	1.84%	0.12%
F 103	10		0.00	6,531.25	250.25	2,031.33	3.83%	66.36%	3.11%	0.12%

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
F 104	4			No events found						
F 105	30		0.00	6,531.25	417.33	9,035.58	6.39%	80.51%	4.61%	0.29%
F 107/108 - RECORDING STUDIO	3			No events found						
F 109/110 - MUSIC PRACTICE ROOMS	2			No events found						
F 115	84		0.00	6,531.25	611.33	10,327.50	9.36%	50.82%	1.88%	0.18%
F 115 STEINWAY PIANO	0		0.00	6,531.25	25.50	0.00	0.39%	0%	0%	0%
F 120	18		0.00	6,531.25	392.00	5,494.00	6%	65.28%	4.67%	0.28%
F 126	0			No events found						
F 130	20		0.00	6,531.25	484.00	10,088.00	7.41%	75.91%	7.72%	0.57%
F 132	50		0.00	6,531.25	122.00	2,928.00	1.87%	24%	0.9%	0.02%
F 135	18		0.00	6,531.25	489.83	4,329.00	7.5%	48.89%	3.68%	0.28%
F 137 - KILN ROOM	0			No events found						
F BLDG (NO SPACES)	0			No events found						
F CENTER LOBBY	0			No events found						
F NORTH LOBBY	0			No events found						
F SOUTH LOBBY	0			No events found						
FFY GYM	50			No events found						
FH	0			No events found						
FH 109	10			No events found						
FH 110	16		0.00	6,531.25	168.92	8,785.83	2.59%	320.31%	8.41%	0.22%
FH 113	12	0		No events found						
GL 100	24			No events found						
GL 101	40		0.00	6,531.25	562.98	9,107.77	8.62%	39.21%	3.49%	0.3%
GL 102	10		0.00	6,531.25	216.73	1,077.33	3.32%	50%	1.65%	0.05%
GL 103	24		0.00	6,531.25	316.73	2,066.33	4.85%	29.58%	1.32%	0.06%
GL 108	24			No events found						
GL 110	24			No events found						
GL 111	32		0.00	6,531.25	661.50	11,009.50	10.13%	52.71%	5.27%	0.53%
GL 112	40		0.00	6,531.25	529.75	5,438.17	8.11%	24.43%	2.08%	0.17%
GL 114	12		0.00	6,531.25	101.00	480.00	1.55%	47.22%	0.61%	0.01%
GL 200-205 RADAR LABS	2			No events found						
GL 207	12		0.00	6,531.25	225.00	945.00	3.44%	35%	1.21%	0.04%
GL 210	24		0.00	6,531.25	202.50	1,748.50	3.1%	15.08%	1.12%	0.03%
GL 211	40		0.00	6,531.25	557.50	10,776.50	8.54%	42.86%	4.12%	0.35%

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
GL 214	12		0.00	6,531.25	48.00	432.00	0.73%	75%	0.55%	0%
GL 215 - STUDENT ENCLAVE & GALLEY SD 12	16			No events found						
GL 222	36		0.00	6,531.25	990.17	20,489.25	15.16%	54.84%	8.71%	1.32%
GL 231	12			No events found						
GL 251	24		0.00	6,531.25	237.97	2,316.73	3.64%	39.88%	1.48%	0.05%
GL 252	21		0.00	6,531.25	760.00	7,265.00	11.64%	45.24%	5.3%	0.62%
GL 254	27		0.00	6,531.25	728.00	7,764.00	11.15%	39.51%	4.4%	0.49%
GL 256	25		0.00	6,531.25	333.87	5,164.80	5.11%	52%	3.16%	0.16%
GL 257	12		0.00	6,531.25	484.00	3,810.00	7.41%	65.62%	4.86%	0.36%
GL 258	0			No events found						
GL 269	106		0.00	6,531.25	428.62	6,638.80	6.56%	12.35%	0.96%	0.06%
GL 271	0			No events found						
GL BLDG (NO SPACES)	0			No events found						
GL CULINARY OFFICE	0			No events found						
GL HARBOR LAWN	0			No events found						
GL MARITIME OFFICE	0			No events found						
GL PIER	0			No events found						
GL RECEPTION DESK & WORKROOM	0			No events found						
GL T/S STATE OF MICHIGAN	0			No events found						
GL WEST LAWN	0			No events found						
GTA ROOM	32			No events found						
Greenspire School - UC 211-219	0	0		No events found						
HC A	156			No events found						
HC A & 1/2 B	264			No events found						
HC A & B	420			No events found						
HC B	192			No events found						
HC B & C	432			No events found						
HC BALLROOM	594			No events found						
HC C	224			No events found						
HC C & 1/2 B	314			No events found						
HC CATWALK	0			No events found						
HC COURTYARD	300			No events found						
HC HAGERTY OFFICE	0			No events found						

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
HC OFF-SITE	999			No events found						
HC ROTARY HALL	64			No events found						
HC Room D	76			No events found						
HOMESTEAD	0			No events found						
HS 110	12		0.00	6,531.25	214.00	1,528.00	3.28%	61.67%	1.95%	0.06%
HS 111	25		0.00	6,531.25	152.00	3,196.00	2.33%	84%	1.96%	0.05%
HS 111/113 VESTIBULE	0	0		No events found						
HS 111A	9			No events found						
HS 112	16		0.00	6,531.25	60.00	540.00	0.92%	56.25%	0.52%	0%
HS 113	25		0.00	6,531.25	354.00	4,627.25	5.42%	66%	2.83%	0.15%
HS 114	32		33.25	6,498.00	748.08	10,932.83	11.51%	42.71%	5.26%	0.61%
HS 115	25		0.00	6,531.25	188.00	2,907.00	2.88%	49.6%	1.78%	0.05%
HS 115/117 VESTIBULE	0	0		No events found						
HS 116	32		0.00	6,531.25	685.83	12,430.33	10.5%	42.19%	5.95%	0.62%
HS 117	25		0.00	6,531.25	356.00	6,228.50	5.45%	70.4%	3.81%	0.21%
HS 117A	14			No events found						
HS 119 GREENHOUSE	24			No events found						
HS 208	24		0.00	6,531.25	13.50	931.50	0.21%	95.83%	0.59%	0%
HS 208/210	20			No events found						
HS 210	24		0.00	6,531.25	726.00	45,414.00	11.12%	104.17%	28.97%	3.22%
HS 211	27		0.00	6,531.25	432.00	5,957.50	6.61%	42.82%	3.38%	0.22%
HS 212	8		0.00	6,531.25	10.50	42.00	0.16%	50%	0.08%	0%
HS 213	24		0.00	6,531.25	429.00	7,252.00	6.57%	64.95%	4.63%	0.3%
HS 214	11		0.00	6,531.25	13.50	42.00	0.21%	28.28%	0.06%	0%
HS 215	24		0.00	6,531.25	274.00	4,094.00	4.2%	62.5%	2.61%	0.11%
HS 216	30		0.00	6,531.25	542.75	10,919.50	8.31%	48.89%	5.57%	0.46%
HS 217	24		0.00	6,531.25	30.00	300.00	0.46%	41.67%	0.19%	0%
HS BLDG (NO SPACES)	0			No events found						
HS BOOKSTORE	32			No events found						
HS BOOKSTORE STORAGE	54			No events found						
HS LOBBY	0			No events found						
HS LOBBY - UPSTAIRS	0			No events found						
JB 127 (MEDIA SERVICES)	0			No events found						
JB 128	1			No events found						

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
JB 130	14			No events found						
JB 136	48		0.00	6,531.25	4.00	64.00	0.06%	33.33%	0.02%	0%
JB 140	48		0.00	6,531.25	88.00	782.00	1.35%	18.75%	0.25%	0%
JB 146	36			No events found						
JB 146/147	72		0.00	6,531.25	131.50	1,876.50	2.01%	18.98%	0.4%	0.01%
JB 147	36			No events found						
JB 148	35		0.00	6,531.25	181.50	4,800.00	2.78%	77.62%	2.1%	0.06%
JB 149	35		0.00	6,531.25	103.50	0.00	1.58%	0%	0%	0%
JB 202	17		0.00	6,531.25	377.67	9,383.58	5.78%	148.42%	8.45%	0.49%
JB 204	20		0.00	6,531.25	724.00	12,224.00	11.09%	76.33%	9.36%	1.04%
JB 214	24		0.00	6,531.25	187.83	3,608.17	2.88%	56.25%	2.3%	0.07%
JB 215	30		241.50	6,289.75	136.50	3,475.50	2.17%	90%	1.84%	0.04%
JB 216	35		0.00	6,531.25	197.50	3,429.00	3.02%	38.86%	1.5%	0.05%
JB 217	24		0.00	6,531.25	177.00	2,446.50	2.71%	22.22%	1.56%	0.04%
JB BLDG (NO SPACES)	0			No events found						
JB FIRST LEVEL LOBBY	0			No events found						
JB SECOND LEVEL LOBBY	0			No events found						
JB SIMPLY-TO-	0			No events found						
LB 105	40		0.00	6,531.25	662.00	9,984.00	10.14%	36.09%	3.82%	0.39%
LB 106 - STUDENT HEALTH SERVICES	0			No events found						
LB 206	42		0.00	6,531.25	699.08	13,643.58	10.7%	30.95%	4.97%	0.53%
LB 207	40		0.00	6,531.25	568.00	8,739.50	8.7%	26.25%	3.35%	0.29%
LB 208	40		546.00	5,985.25	577.50	7,809.25	9.65%	25%	3.26%	0.31%
LB 32 (STUDY ROOM)	7			No events found						
LB 35/37	24		0.00	6,531.25	431.58	8,332.00	6.61%	48.81%	5.32%	0.35%
LB 38	70		0.00	6,531.25	230.00	17,700.00	3.52%	30.65%	3.87%	0.14%
LB BLDG	0			No events found						
LB LOBBY	0			No events found						
LOBDELL'S RESTAURANT - BOT	0			No events found						
LUCKY JACK'S	0			No events found						
MILL CREEK ELEMENTARY	30			No events found						
O 103	4	0		No events found						
O 113	23		0.00	6,531.25	151.50	2,502.00	2.32%	32.92%	1.67%	0.04%
O 152 TUTORING	0			No events found						

Location Utilization Summary

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O 201	12			No events found						
O 202	24			No events found						
O 203	72		0.00	6,531.25	110.00	2,028.00	1.68%	16.11%	0.43%	0.01%
O 204	30		0.00	6,531.25	180.00	3,840.00	2.76%	63.33%	1.96%	0.05%
O 205	72		0.00	6,531.25	126.50	4,628.00	1.94%	33.33%	0.98%	0.02%
O 208 OFFICE	2			No events found						
O 209 OFFICE	2			No events found						
O 210 OFFICE	2			No events found						
O BLDG (NO SPACES)	0			No events found						
O LOBBY	0			No events found						
O SIMPLY-TO-GO CAFE	0			No events found						
O SSC	50			No events found						
OBSV BLDG	60		0.00	6,531.25	185.00	2,218.00	2.83%	17.38%	0.57%	0.02%
OBSV GATE	0		0.00	6,531.25	3.00	0.00	0.05%	0%	0%	0%
OC 102	5			No events found						
OC 112	91			No events found						
OC 129	20		0.00	6,531.25	2.00	0.00	0.03%	0%	0%	0%
OC A	44			No events found						
OC A/B	88			No events found						
OC ABC	132			No events found						
OC B	44			No events found						
OC B/C	88			No events found						
OC BACK DOOR (NO SPACES)	0			No events found						
OC BLDG (NO SPACES)	0			No events found						
OC C	44			No events found						
OC LOBBY	86			No events found						
OFF CAMPUS	9999999			No events found						
ONLINE CLASS	9999999		0.00	6,531.25	250.25	3,902.00	3.83%	0%	0%	0%
OPEN TO PUBLIC	9999999			No events found						
OSTERLIN TESTING SITE A	25	0	0.00	6,531.25	51.58	0.00	0.79%	0%	0%	0%
OSTERLIN TESTING SITE B	25	0	0.00	6,531.25	51.58	0.00	0.79%	0%	0%	0%
Off Site Catering	0	0		No events found						
P 100	90		261.00	6,270.25	385.58	2,190.00	6.15%	2.01%	0.39%	0.02%
P 100N	50			No events found						

Location Utilization Summary

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P 100S	50			No events found						
P 107	5			No events found						
P 120	40		261.00	6,270.25	185.50	4,696.00	2.96%	32.5%	1.87%	0.06%
P 202	24			No events found						
P 206	30		261.00	6,270.25	122.00	1,956.00	1.95%	26.67%	1.04%	0.02%
P 207 (MEDIA SERVICES)	0			No events found						
P BUILDING	0			No events found						
P LOBBY	0			No events found						
P SHOWER ROOMS	0			No events found						
PHG GYM	500			No events found						
PRESIDENT'S CONFERENCE ROOM	5			No events found						
PRESIDENT'S OFFICE	0			No events found						
PS - HALL OF TECHNOLOGY	0			No events found						
PS 101/103	78		0.00	6,531.25	292.50	3,905.00	4.48%	10.58%	0.77%	0.03%
PS 104B	0			No events found						
PS 105 (NOT RENTABLE)	12			No events found						
PS 106	16			No events found						
PS 106K SIMPLY-TO-GO CAFE	0			No events found						
PS 107	16		0.00	6,531.25	617.00	6,914.00	9.45%	54.91%	6.62%	0.63%
PS 110	12			No events found						
PS 112 - Aviation Simulators	32		252.50	6,278.75	321.58	4,129.67	5.12%	46.88%	2.06%	0.11%
PS 114	24			No events found						
PS 115 - MMTC-NL	24			No events found						
PS 151	22		0.00	6,531.25	406.50	2,720.00	6.22%	29.55%	1.89%	0.12%
PS 151C	20	0		No events found						
PS 151D	20	0		No events found						
PS 151E	20	0		No events found						
PS 153	12		0.00	6,531.25	120.00	900.00	1.84%	62.5%	1.15%	0.02%
PS 154 (RESOURCE ROOM)	6			No events found						
PS 155	24		0.00	6,531.25	862.50	6,176.00	13.21%	29.81%	3.94%	0.52%
PS 157	96			No events found						
PS 157A	16		0.00	6,531.25	244.00	1,480.00	3.74%	31.25%	1.42%	0.05%
PS 157B	16			No events found						
PS 157C	7			No events found						

Location Utilization Summary

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PS 159	0			No events found						
PS 1ST FLOOR COMMONS	0			No events found						
PS 201	24		0.00	6,531.25	239.92	3,212.83	3.67%	60%	2.05%	0.08%
PS 203	24		0.00	6,531.25	395.50	3,560.00	6.06%	25%	2.27%	0.14%
PS 204	19		0.00	6,531.25	153.00	6,270.00	2.34%	107.89%	5.05%	0.12%
PS 204 B - RESOURCE ROOM	0			No events found						
PS 205	24		0.00	6,531.25	176.00	1,580.00	2.69%	37.5%	1.01%	0.03%
PS 206	20			No events found						
PS 206A	0			No events found						
PS 216	0			No events found						
PS 217/219	20		0.00	6,531.25	416.17	5,042.50	6.37%	32.31%	3.86%	0.25%
PS 218	16		0.00	6,531.25	91.50	823.50	1.4%	56.25%	0.79%	0.01%
PS 220	30		0.00	6,531.25	231.50	2,572.00	3.54%	35.33%	1.31%	0.05%
PS 222	24		0.00	6,531.25	60.00	1,020.00	0.92%	70.83%	0.65%	0.01%
PS 222/224	56		0.00	6,531.25	574.33	9,105.75	8.79%	32.29%	2.49%	0.22%
PS 224	24			No events found						
PS 225	24			No events found						
PS 226	24		0.00	6,531.25	282.50	2,539.00	4.33%	34.52%	1.62%	0.07%
PS 227	14			No events found						
PS 2ND FLOOR COMMONS	0			No events found						
PS AIRPORT SIDE PATIO	0			No events found						
PS BLDG (NO SPACES)	0			No events found						
PS BUILDING	0			No events found						
PS EAST OFFICE WING	0			No events found						
PS NORTH OFFICE WING	0			No events found						
PS RECEPTION LOBBY	0			No events found						
PS SOLAR TRAILER	0			No events found						
SBHS SBHS	20			No events found						
SH FIRST LEVEL WEST LOBBY	0			No events found						
SH 09	24		0.00	6,531.25	82.50	1,320.00	1.26%	66.67%	0.84%	0.01%
SH 101	40		0.00	6,531.25	348.33	7,209.50	5.33%	52.25%	2.76%	0.15%
SH 102	40		0.00	6,531.25	210.75	3,927.50	3.23%	45%	1.5%	0.05%
SH 103	24		24.75	6,506.50	146.33	2,713.33	2.25%	75%	1.74%	0.04%
SH 103/105	64			No events found						

Location Utilization Summary

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SH 104	32		0.00	6,531.25	367.75	7,045.50	5.63%	59.82%	3.37%	0.19%
SH 105	40		0.00	6,531.25	335.50	6,100.00	5.14%	43.6%	2.33%	0.12%
SH 106	32		0.00	6,531.25	96.00	1,909.50	1.47%	59.58%	0.91%	0.01%
SH 107 - FACULTY & STAFF BREAKROOM	10			No events found						
SH 109	120		0.00	6,531.25	21.00	1,519.00	0.32%	22.92%	0.19%	0%
SH 113	40		0.00	6,531.25	386.50	5,765.50	5.92%	34.17%	2.21%	0.13%
SH 13-The Neurodiversity Support Center	10			No events found						
SH 15	24		0.00	6,531.25	60.00	1,200.00	0.92%	83.33%	0.77%	0.01%
SH 19	0			No events found						
SH 20	24		0.00	6,531.25	20.00	0.00	0.31%	0%	0%	0%
SH 20/22	60		0.00	6,531.25	911.50	6,910.00	13.96%	11.23%	1.76%	0.25%
SH 202	40		0.00	6,531.25	658.25	12,200.00	10.08%	44.29%	4.67%	0.47%
SH 204	28		0.00	6,531.25	481.40	8,669.90	7.37%	63.93%	4.74%	0.35%
SH 205	24		0.00	6,531.25	503.83	8,479.17	7.71%	70.45%	5.41%	0.42%
SH 206	25		0.00	6,531.25	62.00	1,350.00	0.95%	74%	0.83%	0.01%
SH 207	32		0.00	6,531.25	634.30	10,916.60	9.71%	52.86%	5.22%	0.51%
SH 209	32		0.00	6,531.25	606.00	11,678.00	9.28%	59.94%	5.59%	0.52%
SH 215 - FACULTY & STAFF BREAK ROOM	10			No events found						
SH 217	77		0.00	6,531.25	184.00	3,180.00	2.82%	17.21%	0.63%	0.02%
SH 218	23		0.00	6,531.25	63.00	0.00	0.96%	0%	0%	0%
SH 22	32		0.00	6,531.25	10.00	0.00	0.15%	0%	0%	0%
SH 221 - WRITING & READING CNTR SD 10	0			No events found						
SH 23 - WHITE PINE PRESS OFFICE	10			No events found						
SH 28 - NMC MAGAZINE	5			No events found						
SH 30	32			No events found						
SH 32	32			No events found						
SH BLDG (NO SPACES)	0			No events found						
SH FIRST LEVEL EAST LOBBY	0			No events found						
SH SECOND LEVEL LOBBY	0			No events found						
STUDENT SERVICES CONFERENCE ROOM	10			No events found						
T 51 - TECH HELP DESK	0			No events found						
T 53 - MATH LAB	7			No events found						
TANIS BUILDING (NO SPACES)	0			No events found						

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
TC GOLF AND COUNTRY CLUB	0			No events found						
TC OPERA HOUSE	0			No events found						
TCAPS	0			No events found						
TCCHS ROOM	0			No events found						
TCWSH ROOM	30		0.00	6,531.25	181.30	2,440.80	2.78%	45.56%	1.25%	0.03%
TECHNOLOGY HELP DESK	0			No events found						
TJNIC 01	6	0		No events found						
TJNIC 02	6	0		No events found						
TJNIC 03	4	0		No events found						
TJNIC 04	4	0		No events found						
TJNIC 08	14	0	0.00	6,531.25	33.50	264.00	0.51%	15.71%	0.29%	0%
TJNIC 09	3	0		No events found						
TJNIC 104	24	0		No events found						
TJNIC 104/105	48	0	0.00	6,531.25	381.67	7,863.50	5.84%	25.6%	2.51%	0.15%
TJNIC 105	24	0		No events found						
TJNIC 106	36	0		No events found						
TJNIC 106/107	76	0	0.00	6,531.25	364.00	14,024.00	5.57%	25.77%	2.83%	0.16%
TJNIC 107	40	0		No events found						
TJNIC 116	4	0	0.00	6,531.25	20.50	0.00	0.31%	0%	0%	0%
TJNIC 117	4	0	0.00	6,531.25	14.00	0.00	0.21%	0%	0%	0%
TJNIC 118	4	0	0.00	6,531.25	7.00	0.00	0.11%	0%	0%	0%
TJNIC 123	24	0	0.00	6,531.25	75.17	0.00	1.15%	0%	0%	0%
TJNIC 124	2	0		No events found						
TJNIC 125	2	0		No events found						
TJNIC 14	30	0	0.00	6,531.25	189.50	3,162.00	2.9%	46%	1.61%	0.05%
TJNIC 15	30	0	0.00	6,531.25	84.50	1,020.00	1.29%	11.33%	0.52%	0.01%
TJNIC 203	0	0	0.00	6,531.25	9.00	0.00	0.14%	0%	0%	0%
TJNIC 207	4	0	0.00	6,531.25	14.00	0.00	0.21%	0%	0%	0%
TJNIC 208	2	0	0.00	6,531.25	14.00	0.00	0.21%	0%	0%	0%
TJNIC 209	4	0	0.00	6,531.25	14.00	0.00	0.21%	0%	0%	0%
TJNIC 35	10	0		No events found						
TJNIC Building	0			No events found						
TJNIC Catering	0	0		No events found						
TJNIC Library	0	0		No events found						

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
TJNIC Lobby	0	0		No events found						
UC 01	24			No events found						
UC 05	42			No events found						
UC 06	22			No events found						
UC 07	44			No events found						
UC 08	13			No events found						
UC 09	24			No events found						
UC 103 (ZONTA)	8			No events found						
UC 105 (ZONTA)	8			No events found						
UC 106	16			No events found						
UC 11	14			No events found						
UC 12	24			No events found						
UC 14	28			No events found						
UC 14/16	48			No events found						
UC 16	28			No events found						
UC 17	0			No events found						
UC 18	0			No events found						
UC 202-F (GRAY)	15			No events found						
UC 204	36			No events found						
UC 205	24			No events found						
UC 206	9			No events found						
UC 207	40			No events found						
UC 208	20		6,531.00	0.25	31.50	472.50	12600%	75%	9450%	1190700%
UC 209	32			No events found						
UC 211	12			No events found						
UC 212	32			No events found						
UC 213	24			No events found						
UC 214	24			No events found						
UC 215	24			No events found						
UC 215/217	48			No events found						
UC 216	24			No events found						
UC 217	24			No events found						
UC 218	24			No events found						
UC 219	24			No events found						

Location Utilization Summary

	(A) Max Capacity	(B) Fill Ratio	(C) Blackout Hours	(D) Possible Hours	(E) Hours Used	(F) Contact Hours	(G) Time Utilization	(H) Class Seat Utilization	(I) Station Utilization	(J) Net Utilization
UC BLDG (NO SPACES)	0			No events found						
UC Basement Common Area Kitchen	10	0		No events found						
UC CAFE	14			No events found						
UC FIRST LEVEL SOUTH LOBBY	6			No events found						
UC GVSU Lower Level	90	0		No events found						
UC LOWER LEVEL SOUTH LOBBY	19			No events found						
UC OFF CAMPUS	0			No events found						
UC PARTNER OFFICE	0			No events found						
UC PATIO	35			No events found						
VIRTUAL MEETING	999999			No events found						
West Hall Catering	0	0		No events found						
Z_P 151C	20	0		No events found						

Column A & B
Maximum Capacity and Fill Ratio are values that may be provided for a location. The location utilization computations cannot be made where Maximum Capacity has not been specified.

Column C
Blackout Hours is the total hours of all blackout dates defined for a location for this report time period.

Column D
Possible Hours is calculated by taking the total possible hours for the report period (K) defined by the user report parameters and subtracting the total blackout hours for the location during that same time period.

Column E
Hours Used is the total number of hours for all occurrences assigned to this location during the report period.

Column F
Contact Hours is the product of (column I), Total Hours Used, and the Selected Head Count for each reservation in the report period.

Column G
Time Utilization is the percentage of hours a location is used during the report period. This is the quotient of (column E), Hours Used, divided by (column D), Possible Hours. This value is expressed as a percentage.

Column H
Class Seat Utilization is the average percentage of seats used for each reservation compared to the Maximum Capacity of the location. Class Seat Utilization is calculated by taking the Selected Head Count, divided by (column A), Maximum Capacity, multiplied by 100. This value is expressed as a percentage.

Column I
Station Utilization is the percentage of total contact hours compared to the total possible contact hours for the location during the report period. The total possible contact hours is the (column A), Maximum Capacity, multiplied by (column D), Total Possible Hours. This value is expressed as a percentage.

Column J
Net Utilization is the product of (column G), Time Utilization, and (column I), Station Utilization. This value is expressed as a percentage.

Column K
The Total Hours per Report Period is computed from the date and time range entered when the report was printed.

Appendix H

Replacement Value — Insurance Appraisal for all Buildings

APPRAISAL OF

NORTHWESTERN MICHIGAN COLLEGE

1701 EAST FRONT STREET

TRAVERSE CITY, MICHIGAN 49686

R.A. Schettler, Inc.

Certified
Appraisal Service

24634 W. FIVE MILE RD.
REDFORD, MI. 48239

(248) 705-5801

Industrial - Commercial

RAS

Residential - Institutional

NOVEMBER 1, 2023

ASSOCIATED RISK MANAGEMENT, INC.
39111 W. SIX MILE ROAD
LIVONIA, MICHIGAN 48152

TO WHOM IT MAY CONCERN:

WE SUBMIT HEREWITH OUR CERTIFIED APPRAISAL OF ASSETS BELONGING TO NORTHWESTERN MICHIGAN COLLEGE, 1701 EAST FRONT, TRAVERSE CITY, MICHIGAN. THIS APPRAISAL INCLUDES BUILDINGS ONLY.

THIS APPRAISAL IS ARRANGED UNDER SEVERAL PROPERTY CLASSIFICATIONS AND FURNISHES AN UNBIASED STATEMENT OF VALUES.

THE "REPLACEMENT VALUE NEW" THE COST THAT WOULD BE INCURRED IN ACQUIRING AN EQUALLY DESIRABLE SUBSTITUTE FOR PROPERTY, WHICH IS DETERMINED IN ACCORDANCE WITH MARKET PRICES PREVAILING AT THE DATE OF THIS APPRAISAL AND REPRESENTS THE COST TO REPLACE NEW, THE PROPERTY IN LIKE KIND.

THE "SOUND OR INSURABLE VALUE" INDICATING PRESENT PHYSICAL SOUND VALUES OF THE PROPERTY OF AN OPERATING ENTERPRISE BASED UPON THE COST OF REPRODUCTION NEW, LESS AN ALLOWANCE FOR ACCRUED DEPRECIATION RESULTING FROM ITS AGE, CONDITION AND DEGREE OF OBSOLESCENCE.

A SUMMARY IMMEDIATELY FOLLOWING THIS LETTER SHOWS THE REPLACEMENT VALUE NEW AND SOUND INSURABLE VALUES SEGREGATED ACCORDING TO ACCOUNTS ESTABLISHED BY OUR COMPANY.

IN ORDER THAT YOU MAY FULLY UNDERSTAND THE SERVICES WE HAVE RENDERED, WE PRESENT THE IMPORTANT POINTS AS FOLLOWS:

FIRST: ALL PHYSICAL CHANGES OF THEIR PROPERTY (ADDITIONS, REMOVALS, REPLACEMENTS, ALTERATIONS AND CHANGES IN LOCATION) AS FURNISHED BY THEIR MANAGERIAL STAFF AND/OR RECORDS HAVE BEEN INCORPORATED IN THE APPRAISAL.

SECOND: WE HAVE CHECKED AND VERIFIED BY PERSONAL INVESTIGATION ALL CHANGES SUBMITTED BY THEIR STAFF.

THIRD: WITH THE INFORMATION OBTAINED FROM THEIR RECORDS, WE HAVE DEDUCTED IN DOLLARS ALL RETIREMENTS AND ABANDONMENTS THAT HAVE TRANSPIRED SINCE THE DATE OF THEIR LAST APPRAISAL.

ECONOMIC CONDITIONS AFFECTING THE CONSTRUCTION, EQUIPMENT AND LABOR MARKETS, VALUES SHOWN ARE SUBJECT TO ADJUSTMENT, AS REQUIRED, AFTER THE DATE SPECIFIED IN CERTIFICATES.

WE HAVE NOT EXAMINED THE LEGAL TITLES OF PROPERTY; THEREFORE WE DO NOT ASSUME RESPONSIBILITY REGARDING THE OWNERSHIP OF PROPERTY IN THIS APPRAISAL.

VERY TRULY YOURS,

R. A. SCHETTLER, INC.

RAS/mbj

R.A. Schettler, Inc.

Certified
Appraisal Service

24634 W. FIVE MILE RD.
REDFORD, MI. 48239

(248) 705-5801

Industrial - Commercial

RAS

Residential - Institutional

NOVEMBER 1, 2023

NORTHWESTERN MICHIGAN COLLEGE
1701 EAST FRONT STREET
TRAVERSE CITY, MICHIGAN 49686

TO WHOM IT MAY CONCERN:

WE SUBMIT HEREWITH OUR CERTIFIED APPRAISAL OF ASSETS BELONGING TO NORTHWESTERN MICHIGAN COLLEGE, 1701 EAST FRONT, TRAVERSE CITY, MICHIGAN. THIS APPRAISAL INCLUDES BUILDINGS ONLY.

THIS APPRAISAL IS ARRANGED UNDER SEVERAL PROPERTY CLASSIFICATIONS AND FURNISHES AN UNBIASED STATEMENT OF VALUES.

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VERY TRULY YOURS,

R. A. SCHETTLER, INC.

RAS/MBJ

R.A SCHETTLER, INC.

REGISTERED APPRAISERS

-CERTIFY-

THAT ON THE DATE GIVEN IN THIS CERTIFICATE, THE PROPERTY OF

NORTHWESTERN MICHIGAN COLLEGE

LOCATED AT: 1701 EAST FRONT STREET

TRAVERSE CITY, MICHIGAN 49686

WAS WELL AND REASONABLY WORTH:

TWO HUNDRED NINTY-FOUR MILLION,
THIRTY-FOUR THOUSAND, TWO HUNDRED DOLLARS.

ON THE BASIS OF ITS REPLACEMENT VALUE NEW

DISTRIBUTION OF VALUES ARE AS FOLLOWS:

REAL ESTATE - BUILDINGS. $294,034,200.00

DATE: NOVEMBER FIRST TWO THOUSAND TWENTY-THREE R.A. SCHETTLER, INC.

PROJECT NO: 2186 BY _____

R.A SCHETTLER, INC.

REGISTERED APPRAISERS

-CERTIFY-

THAT ON THE DATE GIVEN IN THIS CERTIFICATE, THE PROPERTY OF

NORTHWESTERN MICHIGAN COLLEGE

LOCATED AT: 1701 EAST FRONT STREET

TRAVERSE CITY, MICHIGAN 49686

WAS WELL AND REASONABLY WORTH:

TWO HUNDRED THREE MILLION, NINE HUNDRED THOUSAND, SIX HUNDRED DOLLARS

ON THE BASIS OF ITS SOUND VALUATION

DISTRIBUTION OF VALUES ARE AS FOLLOWS:

REAL ESTATE - BUILDINGS. $203,900,600.00

DATE: NOVEMBER FIRST TWO THOUSAND TWENTY-THREE R.A. SCHETTLER, INC.

PROJECT NO: 2186 BY _____

R.A. SCHETTLER, INC
SUMMATION

Asset Acct: NORTHWESTERN MICHIGAN COLLEGE As of 11/1/23
REAL ESTATE - BUILDING -

Summary by:	Replacement Value New	Sound or Depr. Value
TANIS/BIEDERMAN/HEALTH & SCIENCE	43,641,800.00	30,985,700.00
APARTMENT A	2,554,000.00	1,251,500.00
APARTMENT B	2,554,000.00	1,251,500.00
APARTMENT C	2,554,000.00	1,251,500.00
EASTERN AVENUE STORAGE BUILDING	82,300.00	58,400.00
APPEL BIOLOGY LABORATORY	218,400.00	76,400.00
AVIATION	3,432,200.00	1,819,100.00
BECKETT	11,676,900.00	8,757,700.00
FOUNDERS HALL	1,677,900.00	1,057,100.00
EAST HALL	17,130,300.00	9,421,700.00
FINE ARTS	6,913,000.00	4,078,700.00
OSTERLIN LIBRARY	17,251,600.00	9,315,900.00
MUSEUM/AUDITORIUM	24,735,100.00	18,798,700.00
OBSERVATORY	578,500.00	335,600.00
OLESON CENTER	3,592,700.00	2,550,800.00
PHYSICAL EDUCATION	8,037,300.00	3,616,800.00
POWERHOUSE	3,032,500.00	1,243,300.00
SCHOLARS HALL	22,111,000.00	13,282,200.00
WEST HALL INNOVATION CENTER	24,945,200.00	21,951,800.00
UNIVERSITY CENTER CAMPUS	19,430,000.00	12,823,800.00
UTILITY TUNNELS	2,741,500.00	1,206,300.00
PARSEN-STULLEN M-TEC	21,893,300.00	16,857,800.00
MAINTENANCE	1,457,900.00	1,137,200.00
LANDSCAPE BIN	43,900.00	34,200.00

CONTINUED.....

R.A. SCHETTLER, INC
SUMMATION

Asset Acct: NORTHWESTERN MICHIGAN COLLEGE As of 11/1/23
REAL ESTATE - BUILDING -

Summary by:	Replacement Value New	Sound or Depr. Value
AUTOMOTIVE SERVICE TECHNOLOGY	4,679,500.00	2,854,500.00
GREAT LAKES CAMPUS	31,383,800.00	25,107,000.00
AERO PARK LAB	5,905,400.00	3,484,200.00
NORTH HALL	9,780,200.00	9,291,200.00
GRAND TOTAL	294,034,200.00	203,900,600.00

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE
REAL ESTATE - BUILDING

Bldg.: TANIS/BIEDERMAN/
HEALTH AND SCIENCE

Description	11/1/23
BASEMENT:	
FLOOR	43,700.00
EXTERIOR WALLS	141,500.00
INTERIOR CONSTRUCTION	126,800.00
FOUNDATION:	1,328,000.00
SUPERSTRUCTURE:	
FRAME	1,852,800.00
FLOORS	1,669,600.00
FLOOR COVERINGS	1,298,600.00
CEILINGS	719,800.00
ROOF STRUCTURE	1,214,000.00
ROOF COVER	592,300.00
INTERIOR CONSTRUCTION	6,109,600.00
BUILT-IN FIXTURES	2,700,600.00
ELECTRICAL	4,030,800.00
PLUMBING	2,905,200.00
HEATING	4,517,100.00
MISCELLANEOUS CONSTRUCTION	1,645,500.00
EXTERIOR WALLS	9,890,800.00
TOTAL LABOR AND MATERIALS	40,786,700.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	43,641,800.00
Depreciation %	29%
Sound Valuation	30,985,700.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: TANIS/BIEDERMAN

KIND OF BUILDING: CLASS C

NO. OF STORIES: TWO AND THREE

OCCUPANCY - OFFICES AND CLASSROOMS

SIZE -	FIRST FLOOR	17,707 SQUARE FEET
	SECOND FLOOR	17,907 SQUARE FEET
	THIRD FLOOR	8,718 SQUARE FEET
	TOTAL SQUARE FEET	44,392

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON GROUND, PRECAST PRESTRESSED CONCRETE PLANKS, 3" CONCRETE TOPPING, CONCRETE JOISTS, CONCRETE SLAB

FLOOR COVER - CARPET, OFFICES, CLASSROOMS, CORRIDOR
BRICK, LOBBY
CERAMIC TILE, RESTROOMS
TERRAZZO, STAIRCASES

ROOF STRUCTURE - PRECAST CONCRETE PLANK, SKYLIGHT 20' X 20';
CONCRETE JOISTS PRECAST TEES, CONCRETE SLAB

ROOF COVER - BUILT-UP COMPOSITION, RIGID INSULATION

CEILINGS - SUSPENDED ACOUSTICAL LAY-IN OFFICES AND CLASSROOMS;

- GYPSUM BOARD, PAINTED RESTROOMS

INTERIOR CONSTRUCTION - METAL FRAME PARTITIONS;
- 6" CONCRETE BLOCK PARTITIONS;
- 8" CONCRETE BLOCK PARTITIONS

BUILT-IN FIXTURES -
- MONTGOMERY PASSENGER ELEVATOR, 3 STOP, 2,500 LB. CAPACITY
6 - LAMINATE TOP STUDY TABLES, 24' 10 SWIVEL SEATS EACH
6 - LAMINATE TOP TABLES, 24' WITH 5 SWIVEL SEATS
- RECEPTION DESK, LAMINATE
17 - WALL CABINETS, LAMINATE, 24" WIDE
3 - WALL CABINETS, LAMINATE, 12" WIDE
3 - BASE CABINETS, LAMINATE, SOLID SURFACE TOP, 24" WIDE
2 - BASE CABINETS, LAMINATE, LAMINATE TOP, 24"
2 - BASE CABINETS, LAMINATE, SOLID SURFACE TOP, 12" WIDE
2 - BASE CABINETS, LAMINATE, SOLID SURFACE TOP, 18" WIDE

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

TANIS/BIEDERMAN: continued

MECHANICAL EQUIPMENT:

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
- 14 - WATER CLOSETS
- 16 - LAVATORIES
- 6 - URINALS
- 2 - SANITARY SINKS
- 3 - DRINKING FOUNTAINS
- 1 - WATER HEATER, ELECTRIC, 200 GALLON
- 1 - HOSPITAL SINK, STAINLESS STEEL

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES; DISTRIBUTION PANEL, TRANSFORMERS
- 1 - 500 KVA TRANSFORMER

HEATING AND AIR CONDITIONING -
- STEAM FROM POWERHOUSE
- McQUAY MODEL MSL164BH AIR HANDLING UNIT
- McQUAY MODEL WHR080B2 PACKAGED WATER CHILLER, 70-TON
- HEATING PUMPS AND CHILLED WATER PUMPS AS REQUIRED
- LIEBERT COMPUTER ROOM CONDENSING UNIT
- KOLDWAVE AIR CONDITIONING UNIT
- MITSUBISHI PKG-30F WALL MOUNT AIR CONDITIONER
- MITSUBISHI CONDENSING UNIT
- BRYANT MODEL 580FEV151224AA PACKAGED GAS HEAT, 12 1/2 TON COOLING UNIT, #4907G30305
- CARRIER MODEL 48TME012-611 PACKAGED GAS HEAT, 12 TON COOLING UNIT, #1709G10902
- ABB VARIABLE FREQUENCY DRIVES

EXTERIOR WALLS - 14" CONCRETE
- FACE BRICK BLOCK BACK-UP, 12"
- DRYVIT, BLOCK BACK-UP, 8"
- 12" CONCRETE
- CURTAIN WALL

MISCELLANEOUS:
- SPRINKLERS THROUGHOUT
- COMPUTER ROOM FLOOR
- NOTIFIER
- FIRE ALARM SYSTEM
- 1 - AUTOMATIC DOOR OPENER
- ACCESS CONTROL SYSTEM
- 3 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD
BUILT: TANIS/ADMINISTRATION 1958; RENOVATED 1997
BIEDERMAN/HEALTH EDUCATION 1976; RENOVATED 2002

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: HEALTH AND SCIENCE

KIND OF BUILDING: CLASS C

NO. OF STORIES: TWO WITH PARTIAL BASEMENT, PENTHOUSE

OCCUPANCY: SCIENCE

SIZE: BASEMENT - 4,013 SQUARE FEET
1ST FLOOR - 28,195 SQUARE FEET
2ND FLOOR - 22,821 SQUARE FEET
PENTHOUSE - 6,098 SQUARE FEET

TOTAL SQUARE FEET = 61,127

FOUNDATION: CONCRETE

SUPERSTRUCTURE

FRAME - STEEL

FLOORS - CONCRETE ON GROUND; CONCRETE COMPOSITE ON METAL DECK

FLOOR COVERINGS - CARPET; LINOLEUM; PORCELAIN TILE
CERAMIC TILE

ROOF STRUCTURE - STEEL, CONCRETE ON METAL DECK

ROOF COVER - EPDM ROOF MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL TILE
PERFORATED METAL TILE
GYPSUM BOARD

INTERIOR CONSTRUCTION - MASONRY AND FRAME PARTITIONS

BUILT-IN FIXTURES -
4 - DENTAL DESKS, DOUBLE FACE, WOOD, 74" WIDE
3 - TALL CABINETS, WOOD, 18" WIDE
3 - TALL CABINETS, WOOD, 42" WIDE
1 - TALL CABINET, WOOD, 30" WIDE
28 - WALL CABINETS, WOOD, 36" WIDE
3 - WALL CABINETS, WOOD, 24" WIDE
2 - WALL CABINETS, WOOD, 12" WIDE
5 - WALL CABINETS, WOOD, 30" WIDE
55 - BASE CABINETS, WITH EPOXY RESIN TOP, WOOD, 36" WIDE
5 - BASE CABINETS, WITH EPOXY RESIN TOP, WOOD, 24" WIDE
16 - BASE CABINETS, WITH EPOXY RESIN TOP, WOOD, 18" WIDE

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

HEALTH SCIENCE: continued

SUPERSTRUCTURE: continued

BUILT-IN FIXTURES - continued

2 - TALL CABINETS, WOOD, 48" WIDE
3 - TALL CABINETS, WOOD, 36" WIDE
7 - WALL CABINETS, WOOD, 24" WIDE
5 - WALL CABINETS, WOOD, 18" WIDE
5 - WALL CABINETS, WOOD, 48" WIDE
10 - WALL CABINETS, WOOD, 42" WIDE
23 - BASE CABINETS, WOOD WITH EPOXY RESIN TOP, 42" WIDE
19 - BASE CABINETS, WOOD, WITH EPOXY RESIN TOP, 21" WIDE
10 - BASE CABINETS, WOOD, EPOXY RESIN TOP, 48" WIDE
3 - BASE CABINETS, WOOD, EPOXY RESIN TOP, 15" WIDE
3 - BASE CABINETS, WOOD, EPOXY RESIN TOP, 12" WIDE
1 - BASE CABINET, WOOD, EPOXY RESIN TOP, 30" WIDE
6 - KNEE SPACE CABINET, WOOD, EPOXY RESIN TOP, 48" WIDE
1 - KNEE SPACE CABINET, WOOD, EPOXY RESIN TOP, 52" WIDE
12 - DESK, WOOD, EPOXY RESIN TOP, 45" WIDE
18 - LAMINATE BASE CABINETS, LAMINATE TOP, 36" WIDE
5 - LAMINATE BASE CABINETS, LAMINATE TOP, 18" WIDE
2 - LAMINATE BASE CABINETS, LAMINATE TOP, 30" WIDE
- BACKPACK HANGERS, WALL MOUNT
2 - ACCORDIAN PARTITIONS
2 - SENTINEL COIN OPERATED LOCKERS, 5-DOOR, 16 TIER
18 - FUME HOODS WITH CABINET BASE
10 - CORRIDOR BENCH SEATING UNITS, 20 LINEAR FEET EACH WITH 2 TABLES
- EMERGENCY EYE WASH

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
19 - WATER CLOSETS
17 - LAVATORY
6 - URINALS
2 - SANITARY SINKS
4 - DRINKING FOUNTAINS
1 - BATHTUB
1 - LOCHINVAR DOMESTIC HOT WATER TANK

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES,
- PITTWAY NOTIFIER FIRE ALARM SYSTEM
- CLOCK SYSTEM
3 - CONTROLLED POWER EMERGENCY LIGHTING CONTROLLER
- TELEPHONE, DATA, LAN AND FIBER OPTIC

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

HEALTH SCIENCE continued

SUPERSTRUCTURE: continued

HEATING AND AIR CONDITIONING -
- STEAM FROM POWER HOUSE
1 - HAAKON AIRPAK AIR HANDLING UNIT, #01-638101R
1 - TRANE EXHAUST FAN, 30 HORSEPOWER MOTOR
2 - TRANE EXHAUST FANS, 25 HORSEPOWER MOTOR
7 - TRANE UNIT HEATERS
- PUMPS AS REQUIRED
1 - TRANE RAUCD104BL0320 DOO10 ROOFTOP AIR CONDITIONING UNIT #CO1M67625
1 - TRANE RAUCD104BL0320 D0010 ROOFTOP AIR CONDITIONING UNIT #C01M67624
- TRANE PROGRAM CONTROL MODULE
- DRISTEAM VAPOR LOGIC 2 HUMIDIFIER
65 - VARIABLE AIR VOLUME TERMINAL UNITS (VAV)

EXTERIOR WALLS -
- FACE BRICK, BLOCK BACKUP, 12"
- COMPOSITE METAL PANEL SYSTEM AT FASCIA AND SOFFIT
- 1" INSULATED BUTT GLAZING IN ANOD ALUMINUM FRAME, SPLAYED MULLION AND LAP SEAL GLAZING
- 1" INSULATED GLAZING IN ANOD ALUMINUM CURTAIN WALL SYSTEM
- COMPOSITE METAL PANEL SYSTEM IN ANOD ALUMINUM CURTAIN WALL SYSTEM
- SPANDREL GLAZING IN ANOD ALUMINUM CURTAIN WALL SYSTEM

MISCELLANEOUS:
1 - OTIS PASSENGER ELEVATOR, 4 STOP, #38832
- PREFABRICATED GREENHOUSE
- LIFELINE MEDICAL AIR SYSTEM WITH 2 HITACHI 7.5 HORSEPOWER AIR COMPRESSORS
- SNOWMELT SYSTEM WITH 3 HEATWAY 1574 UNITS
- SPRINKLERS THROUGHOUT
- ACCESS CONTROL SYSTEM
5 - CAMERA SECURITY SYSTEM

BUILT: 2002

QUALITY OF CONSTRUCTION: GOOD

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: APARTMENT A
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	93,100.00
SUPERSTRUCTURE:	
FLOORS	199,000.00
FLOOR COVERINGS	181,300.00
CEILINGS	63,700.00
ROOF STRUCTURE	66,700.00
ROOF COVER	40,800.00
INTERIOR CONSTRUCTION	600,600.00
BUILT-IN FIXTURES	69,300.00
ELECTRICAL	208,000.00
PLUMBING	202,700.00
HEATING	201,400.00
MISCELLANEOUS CONSTRUCTION	54,000.00
EXTERIOR WALLS	409,500.00
TOTAL LABOR AND MATERIALS	2,386,900.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	2,554,000.00
Depreciation %	51%
Sound Valuation	1,251,500.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: APARTMENT A

KIND OF BUILDING: CLASS D

NO. OF STORIES: THREE

OCCUPANCY: APARTMENTS

SIZE
1ST FLOOR - 4,133 SQUARE FEET
2ND FLOOR - 4,133 SQUARE FEET
3RD FLOOR - 4,133 SQUARE FEET

TOTAL SQUARE FEET 12,399

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FLOORS - WOOD JOISTS, WOOD DECK; CONCRETE ON GROUND

FLOOR COVERINGS - CARPET IN APARTMENTS AND CORRIDORS
- VINYL TILE IN KITCHENS, BATHROOMS, LAUNDRY ROOM

ROOF STRUCTURE - WOOD TRUSS, WOOD DECK, HIP

ROOF COVER - SHINGLES, INSULATION

CEILINGS - GYPSUM BOARD

INTERIOR CONSTRUCTION - WOOD FRAME PARTITIONS

BUILT-IN FIXTURES - KITCHEN CABINETS WITH 2 COMPARTMENT SINK IN EACH
- 36 COMPARTMENT MAILBOX

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
12 - WATER CLOSETS
23 - LAVATORIES
12 - BATH TUBS
2 - WATER HEATERS, 75 GALLON

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

HEATING AND AIR CONDITIONING -
- PUMPS AS REQUIRED
- 40-GALLON EXPANSION TANK
- BASEBOARD THROUGHOUT
1 - LOCHINVAR MODEL F9XL, GAS FIRED BOILER

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

APARTMENT A: continued

SUPERSTRUCTURE: continued

EXTERIOR WALLS - WOOD FRAME, FACE BRICK

MISCELLANEOUS:

8 - BALCONIES, WOOD CONSTRUCTION WITH RAILING

- FIRE ALARM SYSTEM

2 - AWNINGS, WOOD CONSTRUCTION, 10 X 16'

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1972

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: APARTMENT B
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	93,100.00
SUPERSTRUCTURE:	
FLOORS	199,000.00
FLOOR COVERINGS	181,300.00
CEILINGS	60,500.00
ROOF STRUCTURE	66,700.00
ROOF COVER	40,800.00
INTERIOR CONSTRUCTION	600,600.00
BUILT-IN FIXTURES	69,300.00
ELECTRICAL	208,000.00
PLUMBING	202,700.00
HEATING	201,400.00
MISCELLANEOUS CONSTRUCTION	54,000.00
EXTERIOR WALLS	409,500.00
TOTAL LABOR AND MATERIALS	2,386,900.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	2,554,000.00
Depreciation %	51%
Sound Valuation	1,251,500.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: APARTMENT B

KIND OF BUILDING: CLASS D

NO. OF STORIES: THREE

OCCUPANCY: APARTMENTS

SIZE
1ST FLOOR - 4,133 SQUARE FEET
2ND FLOOR - 4,133 SQUARE FEET
3RD FLOOR - 4,133 SQUARE FEET

TOTAL SQUARE FEET 12,399

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FLOORS - WOOD JOISTS, WOOD DECK; CONCRETE ON GROUND

FLOOR COVERINGS - CARPET IN APARTMENTS AND CORRIDORS
- VINYL TILE IN KITCHENS, BATHROOMS, LAUNDRY ROOM

ROOF STRUCTURE - WOOD TRUSS, WOOD DECK, HIP

ROOF COVER - SHINGLES, INSULATION

CEILINGS - GYPSUM BOARD

INTERIOR CONSTRUCTION - WOOD FRAME PARTITIONS

BUILT-IN FIXTURES - KITCHEN CABINETS WITH 2 COMPARTMENT SINK IN EACH
- 36 COMPARTMENT MAILBOX

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
12 - WATER CLOSETS
23 - LAVATORIES
12 - BATH TUBS
2 - WATER HEATERS, 75 GALLON

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

HEATING AND AIR CONDITIONING -
- PUMPS AS REQUIRED
- 40-GALLON EXPANSION TANK
- BASEBOARD THROUGHOUT
1 - LOCHINVAR MODEL FTXL GAS FIRED BOILER

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

APARTMENT B: continued

SUPERSTRUCTURE: continued

EXTERIOR WALLS - WOOD FRAME, FACE BRICK

MISCELLANEOUS:

8 - BALCONIES, WOOD CONSTRUCTION WITH RAILING

- FIRE ALARM SYSTEM

2 - AWNINGS, WOOD CONSTRUCTION, 10 X 16'

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1972

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: APARTMENT C
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	93,100.00
SUPERSTRUCTURE:	
FLOORS	199,000.00
FLOOR COVERINGS	181,300.00
CEILINGS	60,000.00
ROOF STRUCTURE	66,700.00
ROOF COVER	40,800.00
INTERIOR CONSTRUCTION	600,600.00
BUILT-IN FIXTURES	69,300.00
ELECTRICAL	208,000.00
PLUMBING	202,700.00
HEATING	201,400.00
MISCELLANEOUS CONSTRUCTION	54,000.00
EXTERIOR WALLS	409,500.00
TOTAL LABOR AND MATERIALS	2,386,900.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	2,554,000.00
Depreciation %	51%
Sound Valuation	1,251,500.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: APARTMENT C

KIND OF BUILDING: CLASS D

NO. OF STORIES: THREE

OCCUPANCY: APARTMENTS

SIZE 1ST FLOOR - 4,133 SQUARE FEET
2ND FLOOR - 4,133 SQUARE FEET
3RD FLOOR - 4,133 SQUARE FEET

TOTAL SQUARE FEET 12,399

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FLOORS - WOOD JOISTS, WOOD DECK; CONCRETE ON GROUND

FLOOR COVERINGS - CARPET IN APARTMENTS AND CORRIDORS
- VINYL TILE IN KITCHENS, BATHROOMS, LAUNDRY ROOM

ROOF STRUCTURE - WOOD TRUSS, WOOD DECK, HIP

ROOF COVER - SHINGLES, INSULATION

CEILINGS - GYPSUM BOARD

INTERIOR CONSTRUCTION - WOOD FRAME PARTITIONS

BUILT-IN FIXTURES - KITCHEN CABINETS WITH 2 COMPARTMENT SINK IN EACH
- 36 COMPARTMENT MAILBOX

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
12 - WATER CLOSETS
23 - LAVATORIES
12 - BATH TUBS
2 - WATER HEATERS, 75 GALLON

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

HEATING AND AIR CONDITIONING -
- PUMPS AS REQUIRED
- 40-GALLON EXPANSION TANK
- BASEBOARD THROUGHOUT
1 - LOCHINVAR MODEL FTXL GAS FIRED BOILER

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

APARTMENT C: continued

SUPERSTRUCTURE: continued

EXTERIOR WALLS - WOOD FRAME, FACE BRICK

MISCELLANEOUS:

8 - BALCONIES, WOOD CONSTRUCTION WITH RAILING

- FIRE ALARM SYSTEM

2 - AWNINGS, WOOD CONSTRUCTION, 10 X 16'

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1972

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING
Bldg.: EASTERN AVENUE STORAGE BUILDING

Description	11/1/23
FOUNDATION:	5,700.00
SUPERSTRUCTURE:	
FRAME	6,400.00
FLOORS	12,000.00
CEILINGS	5,700.00
ROOF STRUCTURE	7,600.00
ROOF COVER	6,200.00
INTERIOR CONSTRUCTION	3,700.00
ELECTRICAL	6,200.00
HEATING	1,700.00
EXTERIOR WALLS	23,200.00
TOTAL LABOR AND MATERIALS	78,400.00
ARCHITECT'S PLANS AND SUPERVISION	5%

Replacement Value New	82,300.00
Depreciation %	29%
Sound Valuation	58,400.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: EASTERN AVENUE STORAGE BUILDING

QUALITY OF CONSTRUCTION: AVERAGE

SIZE WIDTH 24', LENGTH 56', HEIGHT 8'/13'

TOTAL SQUARE FEET = 1,344

KIND OF BUILDING: CLASS D

NO. OF STORIES: ONE

OCCUPANCY: STORAGE

FOUNDATION: WOOD

SUPERSTRUCTURE:

FRAME - WOOD

FLOORS - CONCRETE ON GROUND

CEILINGS - PARTICLE BOARD WITH INSULATION

ROOF STRUCTURE - WOOD JOISTS

ROOF COVER - METAL DECK

INTERIOR CONSTRUCTION - ONE WOOD FRAME PARTITION

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT

HEATING - 2 - ELECTROMODE SUSPENDED ELECTRIC UNIT HEATERS

EXTERIOR WALLS - WOOD FRAME, METAL SIDING, SINGLE WALL;
SLIDING METAL DOOR, 99 X 89",
- WOOD FRAME METAL SIDING WITH PARTICLE BOARD
INTERIOR, INSULATION

BUILT: 1992 - ADDITION 1994

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: APPEL BIOLOGY LAB
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	5,500.00
SUPERSTRUCTURE:	
FRAME	3,600.00
FLOORS	15,800.00
FLOOR COVERINGS	18,800.00
CEILINGS	6,900.00
ROOF STRUCTURE	14,900.00
ROOF COVER	6,900.00
INTERIOR CONSTRUCTION	30,800.00
BUILT-IN FIXTURES	13,300.00
ELECTRICAL	15,600.00
PLUMBING	19,900.00
HEATING	6,500.00
EXTERIOR WALLS	49,500.00
TOTAL LABOR AND MATERIALS	208,000.00
ARCHITECT'S PLANS AND SUPERVISION	5%

Replacement Value New	218,400.00
Depreciation %	65%
Sound Valuation	76,400.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: APPEL BIOLOGY LAB - 1891 SARNS RD.

TYPE OF BUILDING: RESIDENTIAL RANCH, CLASS D

NO. OF STORIES: ONE

OCCUPANCY: FIELD LABORATORY WITH CONFERENCE ROOM

TOTAL SQUARE FEET = 1,160, MORE OR LESS

FOUNDATION: CONCRETE BLOCK

SUPERSTRUCTURE:

FRAME - WOODEN FRAME

FLOORS - WOODEN DECK

FLOOR COVERINGS - ASPHALT TILE IN LABORATORY AND DINING AREA
HARDWOOD IN CONFERENCE ROOM, CARPET TILES

CEILINGS - WOOD TOUNGUE AND GROOVE GYPSUM BOARD

ROOF STRUCTURE - WOODEN GABLE

ROOF COVER - ASPHALT SHINGLES

INTERIOR CONSTRUCTION - WOOD FRAME DRYWALL PARTITIONS
- PINE SIDING IN CONFERENCE ROOM

BUILT-IN FIXTURES - 1 - FIREPLACE, BRICK MANTLE
- LAB COUNTER, 30 LINEAR FT. WITH STAINLESS STEEL SINK
1 - YOUNGSTOWN METAL KITCHEN SINK

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
1 - WATER CLOSET
1 - LAVATORY
1 - URINAL
1 - KITCHEN SINK
1 - WATER HEATER, 18 GALLON

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES, INCANDESCENT AND FLUORESCENT FIXTURES

HEATING - RUDD GAS FIRED FURNACE WITH DUCTWORK

EXTERIOR WALLS - VINYL SIDING, WINDOWS IN VINYL SASH

QUALITY OF CONSTRUCTION: AVERAGE
BUILT: 1950'S, RENOVATED IN 1983

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: AVIATION
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	149,700.00
SUPERSTRUCTURE:	
FRAME	363,000.00
FLOORS	280,700.00
FLOOR COVERINGS	53,100.00
CEILINGS	46,200.00
ROOF STRUCTURE	271,800.00
ROOF COVER	279,400.00
INTERIOR CONSTRUCTION	300,800.00
BUILT-IN FIXTURES	15,600.00
ELECTRICAL	410,400.00
PLUMBING	137,600.00
HEATING	122,400.00
MISCELLANEOUS CONSTRUCTION	251,600.00
EXTERIOR WALLS	555,600.00
TOTAL LABOR AND MATERIALS	3,237,900.00
ARCHITECT'S PLANS AND SUPERVISION	6%

Replacement Value New	3,432,200.00
Depreciation %	47%
Sound Valuation	1,819,100.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: AVIATION - 2550 AERO PARK DRIVE

KIND OF BUILDING: CLASS S/C

NO. OF STORIES: ONE

OCCUPANCY: AVIATION HANGAR WITH REPAIR AREA, OFFICES AND CLASSROOMS

TOTAL SQUARE FEET = 20,912 WITH 1,750 SQUARE FT. STORAGE MEZZANINE

FOUNDATION: POURED CONCRETE FOOTINGS, REINFORCED

SUPERSTRUCTURE:

FRAME - STEEL I BEAMS AND COLUMNS

FLOORS - 4" POURED CONCRETE ON SAND FILL
- CONCRETE DECK, MEZZANINE

FLOOR COVERINGS - VINYL ASBESTOS
- CARPETING IN OFFICES AND CLASSROOMS

ROOF STRUCTURE - 1/2" METAL DECK ON RIGID FRAME
- OPEN STEEL FOR METAL

ROOF COVER - SINGLE MEMBRANE WITH INSULATION
- METAL, PRE-ENGINEERED WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL IN OFFICES, CORRIDORS AND CLASSROOMS

INTERIOR CONSTRUCTION - MASONRY BLOCK PARTITIONS

BUILT-IN FIXTURES - 1 - FOLDING PARTITION WALL
- CHALKBOARDS AND TACKBOARDS IN CLASSROOMS
1 - LAMINATE KITCHENETTE COUNTER WITH STAINLESS STEEL SINK

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
4 - WATER CLOSETS
5 - LAVATORIES
2 - URINALS
2 - SANITARY SINKS
1 - RHEEM 50-GALLON WATER HEATER
1 - WATER COOLER

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

AVIATION: continued

SUPERSTRUCTURE: continued

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES, FLUORESCENT TUBE FIXTURES, LED LIGHT FIXTURES IN HANGAR
SQUARE D PANEL BOARD

HEATING AND AIR CONDITIONING -
2 - RUUD GAS FIRED FORCED AIR FURNACES W/AIR CONDITIONING
1 - APPLIED AIR MODEL GIF-100LH UNIT HEATER, 1,250,000 BTU
2 - ARCOAIRE ROOFTOP CONDENSING UNITS WITH INSULATION

EXTERIOR WALLS - PRE-ENGINEERED METAL SIDING; 8" FLUTED BLOCK AND MAIN ENTRANCE

MISCELLANEOUS:

1 - ALUMINUM FOLD-UP HANGAR DOOR, 80' X 20' WITH ELECTRIC OPENING SYSTEM

1 - ALUMINUM FOLD-UP DOOR, 50 X 20' WITH ELECTRIC OPENING SYSTEM

1 - METAL STAIRWAY TO MEZZANINE

1 - FIRE ALARM SYSTEM WITH CONTROL BOX

- ACCESS CONTROL SYSTEM

3 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: AVERAGE

BUILT: 1976

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: BECKETT
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	234,600.00
SUPERSTRUCTURE:	
FRAME	535,800.00
FLOORS	665,100.00
FLOOR COVERINGS	400,100.00
CEILINGS	519,000.00
ROOF STRUCTURE	525,500.00
ROOF COVER	283,500.00
INTERIOR CONSTRUCTION	2,478,500.00
BUILT-IN FIXTURES	16,300.00
ELECTRICAL	1,314,000.00
PLUMBING	776,500.00
HEATING	1,651,500.00
MISCELLANEOUS	65,800.00
EXTERIOR WALLS	1,074,200.00
FIRE PROTECTION	226,800.00
ELEVATORS	145,800.00
TOTAL LABOR AND MATERIALS	10,913,000.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	11,676,900.00
Depreciation %	25%
Sound Valuation	8,757,700.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: BECKETT

KIND OF BUILDING: CLASS C

NO. OF STORIES: PARTIAL TWO

OCCUPANCY: CLASSROOMS/OFFICES

SIZE: FIRST FLOOR 20,221
SECOND FLOOR 14,048

TOTAL SQUARE FEET = 34,269

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON GROUND
- 6-1/2" CONCRETE SLAB ON 3" GALVANIZED METAL DECK, STEEL JOIST

FLOOR COVERINGS - VINYL TILE
- CARPET
- CERAMIC TILE
2 - RECESSED MATS

ROOF STRUCTURE - STEEL JOISTS, METAL DECK, 6-1/2" CONCRETE SLAB

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - GYPSUM BOARD
- SUSPENDED ACOUSTIC PANEL
- SKYLIGHT
- E.I.F.S.

INTERIOR CONSTRUCTION - METAL FRAME PARTITIONS, SOME MASONARY

BUILT-IN FIXTURES -

- LAMINATE BASE CABINET, 11', WITH STAINLESS STEEL SINK

- LAMINATE WALL CABINET, 14'

- ISLAND BASE CABINET, LAMINATE, 12 X 3 X 3' HIGH

- COMPUTER ROOM WORK COUNTER, LAMINATE, 36 LINEAR FEET

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

BECKETT: continued

SUPERSTRUCTURE: continued

MECHANICAL EQUIPMENT

PLUMBING - AN MODERN SYSTEM OF SANITARY FIXTURES CONSISTING OF:
19 - WATER CLOSETS
17 - LAVATORIES
8 - URINAL
2 - SANITARY SINKS
5 - DRINKING FOUNTAINS
1 - WATER HEATER

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

- COMPUTER WIRING

HEATING AND AIR CONDITIONING -

2 - LOCHINVAR MODEL FTX850N GAS FIRED BOILER
25 - WATER FURNACE MODEL USV024TL004CVN HEAT PUMP
- PUMPS AS REQUIRED
- ABB VARIABLE FREQUENCY DRIVES
1 - NIMBUS VIRGAX3 ROOFTOP COOLING TOWER

EXTERIOR WALLS - CONCRETE BLOCK, FACE BRICK, 12"

MISCELLANEOUS:

- OTIS PASSENGER ELEVATOR, 2-STOP, 2500 LB. CAPACITY, #31455
- SPRINKLERS THRU-OUT
- BRIDGE WALKWAY, 12'5 X 20'
2 - AUTOMATIC DOOR OPENERS
- HONEYWELL NOTIFIER FIRE ALARM SYSTEM
- ACCESS CONTROL SYSTEM
4 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1996

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: FOUNDERS HALL
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	38,400.00
SUPERSTRUCTURE:	
FLOORS	66,000.00
FLOOR COVERINGS	59,100.00
CEILINGS	49,000.00
ROOF STRUCTURE	106,100.00
ROOF COVER	69,100.00
INTERIOR CONSTRUCTION	360,200.00
BUILT-IN FIXTURES	39,700.00
ELECTRICAL	188,600.00
PLUMBING	111,200.00
HEATING	152,300.00
MISCELLANEOUS CONSTRUCTION	26,600.00
EXTERIOR WALLS	301,800.00
TOTAL LABOR AND MATERIALS	1,568,100.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	1,677,900.00
Depreciation %	37%
Sound Valuation	1,057,100.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: FOUNDERS HALL

KIND OF BUILDING: CLASS C

NO. OF STORIES: ONE

OCCUPANCY: OFFICES/CONFERENCE ROOMS

TOTAL SQUARE FEET = 4,950

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FLOORS - CONCRETE ON GROUND

FLOOR COVERINGS - VINYL TILE
- CARPET
- CERAMIC TILE

ROOF STRUCTURE - STEEL JOISTS, STEEL DECK

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL PANELS
- GYPSUM BOARD, LOBBY

INTERIOR CONSTRUCTION - MASONRY PARTITIONS
- METAL FRAME PARTITIONS

BUILT-IN FIXTURES - CABINETS IN CONFERENCE ROOMS AND WORK ROOM
- RECEPTION DESK
- BASE CABINET, OAK, 3.5 X 3.5
- BASE CABINET, OAK, STAINLESS STEEL SINK, 7-1/2'
2 - CABINETS, 2 DOOR, LAMINATE, 84" HEIGHT
- WALL CABINETS, LAMINATE, 6 X 11 X 7 X 9'
- BASE CABINETS, LAMINATE, 11 X 7
- WALL CABINETS, OAK, 7-1/2'
- BASE CABINETS, OAK, STAINLESS STEEL SINK, 5'

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
2 - WATER CLOSETS
2 - LAVATORY
1 - URINALS
1 - SANITARY SINKS
1 - DRINKING FOUNTAIN
1 - WATER HEATER

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

FOUNDERS HALL:continued

SUPERSTRUCTURE: continued

HEATING AND AIR CONDITIONING -
2 - TRANE MODEL VCD060C1HOBA COMBINATION COOLING AND HEATING UNITS, GAS FIRED, ROOF TOP
1 - TRANE YSC060 ROOFTOP GAS FIRED HEATING AND AIR CONDITIONING UNIT

EXTERIOR WALLS - FACE BRICK, BLOCK BACK-UP, 12"

MISCELLANEOUS:

- FIRE ALARM SYSTEM
- ACCESS CONTROL SYSTEM
1 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1976

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: EAST HALL
REAL ESTATE - BUILDING

Description	11/1/23
BASEMENT:	
FRAME	165,500.00
FLOOR	51,600.00
CEILING	48,000.00
EXTERIOR WALLS	59,000.00
INTERIOR PARTITION	365,000.00
ELECTRICAL	203,400.00
FOUNDATION:	437,000.00
SUPERSTRUCTURE:	
FRAME	1,548,500.00
FLOORS	1,201,200.00
FLOOR COVERINGS	369,600.00
CEILINGS	449,700.00
ROOF STRUCTURE	455,300.00
ROOF COVER	216,200.00
INTERIOR CONSTRUCTION	3,764,000.00
BUILT-IN FIXTURES	300,600.00
ELECTRICAL	1,904,300.00
PLUMBING	1,451,300.00
HEATING	926,300.00
MISCELLANEOUS CONSTRUCTION	462,000.00
EXTERIOR WALLS	1,631,100.00
TOTAL LABOR AND MATERIALS	16,009,600.00
ARCHITECT'S PLANS AND SUPERVISION	7%
Replacement Value New	17,130,300.00
Depreciation %	45%
Sound Valuation	9,421,700.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: EAST HALL

KIND OF BUILDING: CLASS B

NO. OF STORIES: ONE WITH BASEMENT
THREE

OCCUPANCY - DORMITORY

SIZE:

BASEMENT	5,037 SQUARE FEET
FIRST FLOOR	19,951 SQUARE FEET
SECOND FLOOR	13,650 SQUARE FEET
THIRD FLOOR	13,650 SQUARE FEET
TOTAL SQUARE FEET	52,288

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - CONCRETE COLUMNS AND BEAMS
- STEEL

FLOORS - CONCRETE ON GROUND C, CONCRETE JOISTS AND CONCRETE SLAB

FLOOR COVER - CARPET, OFFICES, LOUNGE AREAS, AND CORRIDORS
- VINYL TILE IN RESIDENT ROOMS, CORRIDORS
- CERAMIC TILE IN RESIDENT BATHROOMS

ROOF STRUCTURE - PRECAST CONCRETE TEE SLAB
- STEEL JOISTS, METAL DECK

ROOF COVER - SINGLE PLY MEMBRANE, INSULATION

CEILINGS - SUSPENDED ACOUSTICAL TILE IN OFFICES AND LOUNGE AREA BLDG C, RESIDENT ROOMS AND CORRIDOR IN BLDG. A AND B
- GYPSUM BOARD

INTERIOR CONSTRUCTION - 8" BLOCK PARTITIONS
- DOUBLE SOLID GYPSUM WALL

BUILT-IN FIXTURES -
2 - 5-DRAWER 2-DOOR WARDROBE CABINETS, WOOD, 48 X 27 X 86" HEIGHT PER RESIDENT ROOM
2 - WOOD BASE CABINETS, LAMINATE MAPLE TOP, 60 X 24" AND STAINLESS STEEL SINK
1 - LAVATORY BASE CABINET, LAMINATE, OAK EDGING IN EACH RESIDENT BATHROOM
1 - RECESSED MEDICINE CABINET AND MIRROR IN EACH RESIDENT BATHROOM
1 - CENTRAL ELEVATOR, PASSENGER ELEVATOR, 3-STOP WITH POWER OPERATED REAR DOOR, 750 LB. CAPACITY

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

EAST HALL: continued
BUILT-IN FIXTURES: continued
- MAIL BOXES, 144 DOORS
- RECEPTION DESK, LAMINATE, 15 LINEAR FT.
- INFORMATION DESK, LAMINATE, 13 LINEAR FT.
- 22 LINEAR FT. OF LAMINATE BASE CABINETS
- 22 LINEAR FT. OF LAMINATE WALL CABINETS
- LAMINATE KITCHEN CABINETS IN SUPERVISOR'S APARTMENT

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
64 - WATER CLOSETS
64 - LAVATORIES
1 - URINALS
2 - SANITARY SINKS
2 - ELECTRIC WATER COOLERS
2 - BATH TUBS
60 - PREFABRICATED FIBERGLASS SHOWERS
2 - LAUNDRY TUBS
1 - WATER HEATER, STEAM HEATED, 6' DIAMETER X 9' LONG

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

HEATING AND AIR CONDITIONING -
2 - LOCHIVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER
- EXHAUST FANS AS REQUIRED
- PUMPS AS REQUIRED
3 - LIEBERT AIR CONDITIONING UNIT WITH CONDENSING UNIT
2 - DUCANE MODEL AC10B24A CONDENSING UNIT
1 - DUCANE MODEL AC10B36B CONDENSING UNIT
1 - DUCANE MODEL AC10B42 CONDENSING UNIT
1 - DUCANE MODEL AC10B60 CONDENSING UNIT
1 - DUCANE MODEL AC10B24 CONDENSING UNIT
1 - DUCANE MODEL AC10B18 CONDENSING UNIT
1 - MITSUBISHI CONDENSING UNIT
- UNIT AND CABINET HEATERS

EXTERIOR WALLS - FACE BRICK, BLOCK BACK-UP, 12"
- EIFS CANOPY
- INSULATED GLASS IN ALUMINUM FRAME

MISCELLANEOUS - HONEYWELL NOTIFIER FIRE ALARM SYSTEM WITH SMOKE DETECTORS
- SPRINKLERS THROUGHOUT
- ACCESS CONTROL SYSTEM
4 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD
BUILT: 1967; RENOVATION OF LOBBY AND BASEMENT, ADDITION OF GENERATOR ROOM,
1999; RESIDENT ROOMS RENOVATED IN 2002

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: FINE ARTS
REAL ESTATE - BUILDING

Description	11/1/23
BASEMENT:	
FLOOR	23,200.00
EXTERIOR WALLS	95,900.00
INTERIOR PARTITION	9,300.00
FOUNDATION:	145,400.00
SUPERSTRUCTURE:	
FLOORS	256,900.00
FLOOR COVERINGS	128,500.00
CEILINGS	2,300.00
ROOF STRUCTURE	572,400.00
ROOF COVER	226,800.00
INTERIOR CONSTRUCTION	1,394,400.00
BUILT-IN FIXTURES	79,400.00
ELECTRICAL	805,600.00
PLUMBING	385,600.00
HEATING	1,016,500.00
MISCELLANEOUS CONSTRUCTION	298,400.00
EXTERIOR WALLS	960,300.00
TOTAL LABOR AND MATERIALS	6,400,900.00
ARCHITECT'S PLANS AND SUPERVISION	8%

Replacement Value New	6,913,000.00
Depreciation %	41%
Sound Valuation	4,078,700.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: FINE ARTS

KIND OF BUILDING: CLASS D

NO. OF STORIES: ONE WITH PARTIAL BASEMENT

OCCUPANCY - ART AND MUSIC CLASSROOMS AND OFFICES

SIZE:

BASEMENT	2,076 SQUARE FEET
FIRST FLOOR	18,800 SQUARE FEET
TOTAL SQUARE FEET	18,800

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - WOOD

FLOORS - CONCRETE ON GROUND

FLOOR COVER - CARPET, CORRIDORS, MUSIC, CLASSROOMS, OFFICES,AUDITORIUM
CERAMIC TILE RESTROOMS

ROOF STRUCTURE - WOOD TRUSS EXPOSED T & G WOOD DECK, 1-1/2" ROD AND TURN BUCKLES
- CONCRETE PLANK

ROOF COVER - ASPHALT SHINGLES, INSULATION
- SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - GYPSUM BOARD IN RESTROOMS;
- GLASS IN MUSIC PRACTICE ROOMS

INTERIOR CONSTRUCTION - MASONRY AND FRAME PARTITIONS

BUILT-IN FIXTURES -

- 175 LINEAR FEET OF CURVED OAK SEATING UNIT WITH FABRIC UPHOLSTERED CUSHIONS
- PROJECTION COUNTER CABINET, WOOD BASE, LAMINATE TOP
1 - ROLLING DOOR, METAL, 16 X 7',CERAMICS
4 - WOOD BASE CABINETS WITH STAINLESS STEEL SINK, 12'
1 - WOOD BASE CABINET WITH STAINLESS STEEL SINK, 4'
1 - WOOD BASE CABINET WITH STAINLESS STEEL SINK, 7'

FINE ARTS: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
- 8 - WATER CLOSETS
- 8 - LAVATORIES
- 3 - URINALS
- 2 - SANITARY SINKS
- 1 - DRINKING FOUNTAINS
- 1 - HOT WATER GENERATOR, 150 GALLON CAPACITY
- 1 - WATER HEATER, ELECTRIC
- 1 - WATER COOLER

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- LITETRACK SYSTEM
- LED LIGHT FIXTURES

HEATING AND AIR CONDITIONING -
- RADIANT PANELS
- 7 - CABINET UNIT HEATERS
- PUMPS AS REQUIRED
- 1 - TRANE MODEL CGAFC25EAHA1AOODE 25-TON CHILLER, #C04J07864
- 1 - TRANE MODEL RAUCC30EBX030BD00020 30-TON CONDENSING UNIT #CO4J07865
- 1 - TRANE MODEL MCCB014UAOAOUB AIR HANDLING UNIT, AHU-2
- 1 - TRANE MODEL MCCB010UAOAOUA AIR HANDLING UNIT, AHU-1
- 1 - TRANE MODEL MCCB025UADAOUA AIR HANDLING UNIT, AHU-3
- 1 - COOK RETURN AIR FAN, 2 HORSEPOWER
- 1 - TACO CHILLER, #T19843
- 1 - LOCHINVAR MODEL KBN800 GAS FIRED DIRECT VENT BOILER # G08H10057962
- 1 - LOCHINVAR MODEL KBN800 GAS FIRED DIRECT VENT BOILER # G08H10057984
- 1 - FUJITSU SPLIT SYSTEM HEATING/AIR CONDITIONING SYSTEM, RM 104
- 1 - FUJITSU MODEL A0U9RLS3H, CONDENSING UNIT, #QVN003966

EXTERIOR WALLS - WOOD STUD, RED CEDAR SIDING, PLYWOOD SHEATHING,
- INSULATION

MISCELLANEOUS - NOTIFIER FIRE ALARM SYSTEM
- 36" DIAMETER KILN STACK, 30' HEIGHT
- SPRINKLERS THUR-OUT
- 1 - MECHANICAL BUILDING WOOD CONSTRUCTION, CONCRETE SLAB, CEDAR SIDING, SINGLE PLY MEMBRANE ROOF COVER, WITH STANDING RIDGES,14' X 22' X 9/14'6", 308 SQ. FEET 308 SQ. FT.
- ACCESS CONTROL SYSTEM
- 1 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD
BUILT: 1970; MECHANICAL BUILDING 2004

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING Bldg.: OSTERLIN LIBRARY

Description	11/1/23
BASEMENT:	
FLOOR	94,300.00
CEILING	44,900.00
EXTERIOR WALLS	201,200.00
INTERIOR PARTITION	504,000.00
ELECTRICAL	278,900.00
FOUNDATION:	408,100.00
SUPERSTRUCTURE:	
FRAME	1,718,700.00
FLOORS	753,200.00
FLOOR COVERINGS	772,700.00
CEILINGS	427,500.00
ROOF STRUCTURE	768,400.00
ROOF COVER	447,100.00
INTERIOR CONSTRUCTION	2,901,200.00
BUILT-IN FIXTURES	293,300.00
ELECTRICAL	1,842,500.00
PLUMBING	946,200.00
HEATING	2,207,500.00
MISCELLANEOUS CONSTRUCTION	344,500.00
EXTERIOR WALLS	1,168,600.00
TOTAL LABOR AND MATERIALS	16,123,000.00
ARCHITECT'S PLANS AND SUPERVISION	7%
Replacement Value New	17,251,600.00
Depreciation %	46%
Sound Valuation	9,315,900.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: OSTERLIN LIBRARY

KIND OF BUILDING: CLASS B

NO. OF STORIES: PARTIAL TWO WITH BASEMENT

OCCUPANCY - MEDIA CENTER, OFFICES AND CLASSROOMS

SIZE:

BASEMENT	7,048 SQUARE FEET
FIRST FLOOR	30,760 SQUARE FEET
SECOND FLOOR	8,926 SQUARE FEET
TOTAL SQUARE FEET	46,734 MORE OR LESS

FOUNDATION: POURED REINFORCED CONCRETE FOOTINGS

SUPERSTRUCTURE:

FRAME - CONCRETE, REINFORCED I BEAMS AND COLUMNS

FLOORS - CONCRETE PRECAST TEES, SLAB ON GRADE

FLOOR COVER - CARPET, LIBRARY, OFFICES AND CLASSROOMS
CERAMIC TILE RESTROOMS
VINYL ASBESTOS TILE IN CORRIDORS
TERRAZZO IN CIRCULATION AREA (UNDER CARPET)

ROOF STRUCTURE - PRECAST CONCRETE TEES, SKYLIGHTS IN ALUMINUM FRAME

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - PARTIAL ACOUSTIC AND SUSPENDED ACOUSTICAL

INTERIOR CONSTRUCTION - MASONRY BLOCK PARTITIONS; SOME PAINTED DRYWALL

BUILT-IN FIXTURES -
1 - ELEVATOR, 2,500 LB. CAPACITY WITH 3 STOPS, 2 DOORS
2 - LAMINATE A.V. REPAIR COUNTERS
1 - KREONITE PLASTIC DARKROOM SINK WITH LAMINATE WORK COUNTERS
1 - REVOLVING DARKROOM DOOR
1 - WOODEN SHOWCASE, 19'6" X 4' X 90" HEIGHT, SLIDING GLASS DOORS
- ALUMINUM FRAME MARKING BOARDS IN CLASSROOMS
1 - SERVICE DESK, LAMINATE 'L' SHAPE, 18 L.F.
1 - SERVICE DESK, LAMINATE, 20 L.F.
1 - CIRCULATION DESK, LAMINATE 'D' SHAPE, 50 L.F.
1 - ISLAND CIRCULATION COUNTER, LAMINATE, 10 L.F.
- LOCKERS

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

OSTERLIN LIBRARY: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
13 - WATER CLOSETS
18 - LAVATORIES
5 - URINALS
2 - SANITARY SINKS
4 - DRINKING FOUNTAINS
1 - HOT WATER HEATER, RHEEM, 82-GALLON

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- FLUORESCENT TUBE FIXTURES;
- WIRING FOR T.V. PRODUCTION STUDIO WITH STAGE LIGHTING GRID
1 - 750 KVA TRANSFORMER

HEATING AND AIR CONDITIONING -
1 - TRANE MODEL MCCB025UAOCOUB AIR HANDLING UNIT, AHU-4
1 - TRANE MODEL RAUCD124BNC320D0010 125 TON CONDENSING UNIT, #CO4B01452
- CABINET AND UNIT HEATERS AS REQUIRED
1 - BOHN MODEL HCS144LF AIR HANDLER
1 - BOHN MODEL HCSZ1AMF AIR HANDLER
1 - BOHN MODEL HMZ26ALF AIR HANDLER
1 - TACO CHILLER
- STEAM FROM POWERHOUSE
- ABB VARIABLE FREQUENCY DRIVES

EXTERIOR WALLS - FACE BRICK ON CONCRETE BLOCK
- WINDOWS IN ALUMINUM SASH
- DRYVIT ON BRICK - SOUTH ELEVATION

MISCELLANEOUS - FIRE ALARM SYSTEM WITH NOTIFIER AFP-200 CONTROL BOX
2 - AUTOMATIC DOOR OPENERS
- SPRINKLERS THRU-OUT
- ACCESS CONTROL SYSTEM
5 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1961 - MAIN BUILDING
1983 - ADDITION

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING Bldg.: MUSEUM/AUDITORIUM

Description	11/1/23
FOUNDATION:	539,400.00
SUPERSTRUCTURE	
FRAME	1,211,700.00
FLOORS	807,400.00
FLOOR COVERINGS	795,700.00
CEILINGS	382,200.00
ROOF STRUCTURE	1,295,900.00
ROOF COVER	1,513,700.00
INTERIOR CONSTRUCTION	4,429,200.00
BUILT-IN FIXTURES	1,871,400.00
ELECTRICAL	2,423,300.00
PLUMBING	791,700.00
HEATING	2,976,700.00
MISCELLANEOUS CONSTRUCTION	596,900.00
EXTERIOR WALLS	3,481,700.00
TOTAL LABOR AND MATERIALS	23,116,900.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	24,735,100.00
Depreciation %	24%
Sound Valuation	18,798,700.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: MUSEUM/AUDITORIUM

KIND OF BUILDING: CLASS C

NO. OF STORIES: ONE

OCCUPANCY - MUSEUM/AUDITORIUM

SIZE: TOTAL SQUARE FEET 55,085

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON GROUND

FLOOR COVER - CARPET IN OFFICES, LOBBY, GIFT SHOP, AUDITORIUM
CERAMIC TILE IN RESTROOMS AND CLASSROOMS
HARDWOOD FLOORS IN EXHIBIT A, B, AND C, STAGE
MARBLE TILE IN LOBBY, RECEPTION, COATS, SCULPTURE COURT, CORRIDOR, VESTIBULE, VINYL TILE IN STORAGE SERVING

ROOF STRUCTURE - OPEN WEB STEEL JOISTS, 1-1/2" METAL DECK
- 8' RADIUS QUARTER VAULT SKYLIGHT

ROOF COVER - STONE BALLAST ON SINGLE PLY ROOF MEMBRANE OVER STEPPED INSULATION OVER 3" RIGID INSULATION

CEILINGS - SUSPENDED ACOUSTICAL PANEL IN OFFICES
- SUSPENDED GYPSUM BOARD
- SUSPENDED CEILING PANELS, AUDITORIUM

INTERIOR CONSTRUCTION - MASONARY AND METAL FRAME PARTITIONS

BUILT-IN FIXTURES -
367 - PLASTIC FIXED THEATER SEATS WITH FABRIC UPHOLSTERED SEAT
3 - LOBBY DISPLAY CASES, SLIDING GLASS DOORS, 12 X 5'
32 - THEATER SEATS, PLASTIC FIXED WITH FABRIC UPHOLSTERED
1 - CURVED OAK RECEPTION DESK, 5' RADIUS LAMINATE WORK SURFACE
- LOBBY CURVED BENCH, OAK TOP
- OFFICE CASEWORK, LAMINATE
- KITCHEN CASEWORK, LAMINATE
- STAINLESS STEEL RINSE SINK
- LIGHTING GRID WITH LED LIGHTS
2 - FOLDING PARTITIONS
- PROJECTION SCREEN
- WINDOW TREATMENT

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

MUSEUM/AUDITORIUM: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
15 - WATER CLOSETS
14 - LAVATORIES
4 - URINALS
2 - DRINKING FOUNTAIN
1 - LOCHINVAR 92-GALLON WATER HEATER
1 - JOHNSON COMPUTERIZED
2 - SHOWERS
1 - ELECTRIC WATER HEATER

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
PHONE, DATA AND VIDEO LINES CONDUIT
1 - 1000 KVA TRANSFORMER

HEATING AND AIR CONDITIONING -
1 - TRANE MODEL CCDB35MEOM DRAW THROUGH CLIMATE CHANGER, #AHU-1
2 - NORTEC CONTROLLER HUMIDIFIERS
1 - JOHNSON THERMOSTATIC CONTROL
1 - TRANE MODEL 14-C CLIMATE CHANGER, #AHU-2
1 - TRANE MODEL 17-C CLIMATE CHANGER, #AHU-3
- PUMPS AS REQUIRE
1 - TRANE MODEL RAUJD10EBA132000010, 100 TON CHILLER #C10H04015
1 - LOCHINVAR KNIGHT MODEL KBN801 GAS FIRED BOILER, #F10H10143653
1 - LOCHINVAR KNIGHT MODEL KBN801 GAS FIRED BOILER, #F10H10143667
1 - TRANE MMDEL CSAA021UAL00, CLIMATE CHANHER AIR HANDLING UNIT #K17A04961 #AHU-4
1 - THERMA-STOR MODEL HI-E DRY 100 DEHUMIDIFIER
1 - DRI-STEEM MODEL GTS200, STEAM HUMIDIFIER
1 - LOCHINVAR MODEL WHN285, GAS , WALL-MOUNT BOILER, #1607102616001
1 - TRANE MODEL RAUJC30EB, ROOF TOP CONDENSING UNIT
1 - LOCHINVAR MODEL WHN285, GAS , WALL-MOUNT BOILER, #1603102505085
1 - ENVIRONMENTAL TECHNOLOGY MODEL APS-3C, SNOW/ICE MELTING CONTROLLER
77 - VAV BOXES

EXTERIOR WALLS - 4" STONE VENEER, 2" RIGID INSULATION, BLOCK BACK-UP
- 8" WITH 4" LIMESTONE BELT COURSES AND COPING
- ALUMINUM WINDOW FRAMING WITH 1" INSULATED LOW E GLAZI

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

MUSEUM/AUDITORIUM: continued

MISCELLANEOUS - ART STORAGE RACKS, TRACK MOUNTED
1 - RECESSED TRUCK DOCK WITH LEVELER
1 - SPRINKLERS THROUGHOUT
2 - CATWALKS
- AUDITORIUM AND MINI THEATER SOUND SYSTEM
- HOUSE PAGING SYSTEM
2 - ROLLING STEEL DOORS WITH ELECTRIC OPERATOR
- ALARM SYSTEM
- ACCESS CONTROL SYSTEM
- SECURITY SYSTEM
3 - CAMERA SECURITY SYSTEM
- AUDITORIUM LED LIGHTING

QUALITY OF CONSTRUCTION: EXCELLENT
BUILT: 1991, ADDITION 2017

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: OBSERVATORY
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	13,100.00
SUPERSTRUCTURE:	
FLOORS	22,100.00
FLOOR COVERINGS	16,100.00
CEILINGS	13,600.00
ROOF STRUCTURE	26,600.00
ROOF COVER	18,600.00
INTERIOR CONSTRUCTION	77,900.00
BUILT-IN FIXTURES	91,000.00
ELECTRICAL	59,100.00
PLUMBING	33,800.00
HEATING	25,500.00
MISCELLANEOUS	18,600.00
EXTERIOR WALLS	129,800.00
TOTAL LABOR AND MATERIALS	545,800.00
ARCHITECT'S PLANS AND SUPERVISION	6%

Replacement Value New	578,500.00
Depreciation %	42%
Sound Valuation	335,600.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: OBSERVATORY - BRIMLEY ROAD

KIND OF BUILDING: CLASS C

NO. OF STORIES: ONE WITH 2 STORY TELESCOPE RECESS

OCCUPANCY - OBSERVATORY WITH CLASSROOM

SIZE: TOTAL SQUARE FEET 1,624 MORE OR LESS

FOUNDATION: POURED CONCRETE

SUPERSTRUCTURE:

FRAME - STRUCTURAL STEEL

FLOORS - 4" REINFORCED CONCRETE

FLOOR COVER - CARPET IN CLASSROOMS, VINYL ASBESTOS TILE

ROOF STRUCTURE - STEEL DECK ON JOIST

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL

INTERIOR CONSTRUCTION - FEW MASONRY PARTITION:
- GYPSUM BOARD WALL COVER

BUILT-IN FIXTURES -

1 - ASH-DOME HEMISPHERE ALUMINIZED STEEL TELESCOPE DOME, 14' DIAMETER WITH SHUTTER SYSTEM

1 - CIRCULAR STAIRWAY TO TELESCOPE ACESS

1 - LAMINATE DARKROOM COUNTER WITH STAINLESS STEEL SINK

1 - ALUMINUM FRAME CHALKBOARD, 20 X 4'

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
1 - WATER CLOSET
1 - LAVATORY
1 - SANITARY SINK
1 - DRINKING FOUNTAIN
1 - HOT WATER HEATER, 8 GALLON

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

OBSERVATORY: continued

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- FLUORESCENT TUBE FIXTURES

HEATING AND AIR CONDITIONING -

1 - TRANE MODEL GXX110F GAS FIRED FORCED AIR FURNACE 110,000 BTU/HR

MISCELLANEOUS - ACCESS CONTROL SYSTEM
1 - CAMERA SECURITY SYSTEM

EXTERIOR WALLS - CONCRETE BLOCK WITH EARTH BERM STUCCO FINISH
- FEW WINDOWS IN ALUMINUM SASH

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1981

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING Bldg.: OLESON CENTER

Description	11/1/23
FOUNDATION:	77,800.00
SUPERSTRUCTURE:	
FRAME	169,100.00
FLOORS	141,600.00
FLOOR COVERINGS	58,500.00
CEILINGS	87,200.00
ROOF STRUCTURE	220,400.00
ROOF COVER	149,000.00
INTERIOR CONSTRUCTION	814,900.00
BUILT-IN FIXTURES	229,700.00
ELECTRICAL	414,000.00
PLUMBING	244,600.00
HEATING AND AIR CONDITIONING	335,400.00
MISCELLANEOUS CONSTRUCTION	143,900.00
EXTERIOR WALLS	271,600.00
TOTAL LABOR AND MATERIALS	3,357,700.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	3,592,700.00
Depreciation %	29%
Sound Valuation	2,550,800.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: OLESON CENTER

KIND OF BUILDING: CLASS C

NO. OF STORIES: ONE

OCCUPANCY - CLASSROOM

SIZE: TOTAL SQUARE FEET 10,398

FOUNDATION: POURED CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - 4" CONCRETE SLAB ON SAND FILL

FLOOR COVER - CARPET IN OFFICES, CLASSROOMS; CERAMIC TILE IN KITCHEN; VINYL IN BATHROOMS, CLASSROOM 112

ROOF STRUCTURE - STEEL DECK ON STEEL JOIST
- HIP ROOF ON JOISTS AND TRUSSES, 1/2" PLYWOOD WITH INSULATION

ROOF COVER - ASPHALT SHINGLES, SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL; GYPSUM BOARD

INTERIOR CONSTRUCTION - MASONRY BLOCK PARTITIONS

BUILT-IN FIXTURES -
1 - HARFORD WALK-IN COOLER, 6 X 12'
2 - FOLDING PARTITION WALLS, 30 X 9'
- TOILET PARTITIONS
4 - PREP TABLES, 4-DOOR, LAMINATE, STAINLESS STEEL DOUBLE SINK, 84 X 30"
2 - GREENHECK STAINLESS STEEL GHEW900S CANOPY HOODS WITH EXHAUST FAN, LIGHTS, 108 X 42 X 24"
2 - DISH TABLES, STAINLESS STEEL WITH SINK, 96 X 30"
1 - HARFORD DURACOOL 86025-1161OR ROOFTOP WALK-IN COOLER REFRIGERATION UNIT, #H192OAC
2 - HOBART LXIH STAINLESS STEEL WAREWASHER
2 - INSINKERATOR SS-150 DISPOSER AND PRERINSE
2 - ANSUL FIRE PROTECTION SYSTEMS
2 - WALL SHELVES, STAINLESS STEEL, 24 X 18"
- VISUAL DISPLAY BOARDS
- WINDOW TREATMENT
1 - WORKSURFACE LAMINATE WALL MOUNTED 'L' SHAPE 19 LINEAR FT.
- BASE CABINET LAMINATE 2-STAINLESS STEEL SINK 22.5 LINEAR FT.
- WALL CABINETS LAMINATE 25.5 LINEAR FT.

OLESON CENTER: continued

BUILT-IN FIXTURES - continued
3 - COAT RACKS, OAK WALL MOUNTED, 39X16"
3 - COAT RACKS, OAK WALL MOUNTED, 48X16"

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
7 - WATER CLOSETS
6 - LAVATORIES
2 - URINALS
2 - SANITARY SINKS
2 - DRINKING FOUNTAINS
1 - RHEEM RUUD 91 GALLON GAS WATER HEATER
1 - RHEEM WATER HEATER, ELECTRIC

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- FLUORESCENT TUBE FIXTURES
- INCANDESCENT SPOTLIGHTS IN LOBBY AND MEETING ROOMS

HEATING AND AIR CONDITIONING -
1 - TRANE YSC092A3RLA2FDOAO10/0300 PACKAGED GAS/ELECTRIC ROOFTOP UNIT, 7-1/2 TON CAPACITY, #635102686L
1 - TRANE YSC092A3RHA2FDOAOF11B10300 PACKAGED GAS/ELECTRIC ROOFTOP UNIT, 7-1/2 TON CAPACITY, #635102986L
1 - TRANE YSC048A3RHA2MD2A101300 PACKAGED GAS/ELECTRIC ROOFTOP UNIT, 4-TON CAPACITY, #635102880L
1 - TRANE YSC060A3RHA2TD2AOA/B10300 PACKAGED GAS/ELECTRIC ROOFTOP UNIT, 5 TON CAPACITY, #635102790L
1 - TRANE YSCO60A3RHA2TD2AOA/B10300 PACKAGED GAS/ELECTRIC ROOFTOP UNIT, 5-TON CAPACITY, #6351026654L
1 - AAON INC. RM-013-8-0-AA02-367 PACKAGED GAS/ELECTRIC ROOFTOP UNIT, 13-TON CAPACITY, #200609-AMGK28824

EXTERIOR WALLS - 8" CONCRETE BLOCK WITH FLUSH WOOD SIDING
- WINDOWS IN ALUMINUM SASH
8" SPLIT FACED CONCRETE BLOCK

MISCELLANEOUS -
1 - SPRINKLER SYSTEM THRU-OUT
1 - NOTIFIER MODEL APF - 200 FIRE ALARM CONTROL SYSTEM
1 - CANOPY, CONCRETE/STEEL, 6 X 12'
- ACCESS CONTROL SYSTEM
2 - CAMERA SECURITY SYSTEM
- SPRINKLER SYSTEM, MODIFIED FOR PUBLIC SCHOOL

QUALITY OF CONSTRUCTION: VERY GOOD
BUILT: 1978; ADDITION AND RENOVATED IN 2006

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING Bldg.: PHYSICAL EDUCATION

Description	11/1/23
FOUNDATION:	235,200.00
SUPERSTRUCTURE:	
FRAME	602,300.00
FLOORS	416,400.00
FLOOR COVERINGS	492,700.00
CEILINGS	184,100.00
ROOF STRUCTURE	413,400.00
ROOF COVER	192,800.00
INTERIOR CONSTRUCTION	1,659,900.00
BUILT-IN FIXTURES	192,700.00
ELECTRICAL	797,000.00
PLUMBING	583,200.00
HEATING AND AIR CONDITIONING	600,900.00
MISCELLANEOUS CONSTRUCTION	184,900.00
EXTERIOR WALLS	956,000.00
TOTAL LABOR AND MATERIALS	7,511,500.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	8,037,300.00
Depreciation %	55%
Sound Valuation	3,616,800.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: PHYSICAL EDUCATION

KIND OF BUILDING: CLASS C

NO. OF STORIES: ONE - PARTIAL TWO

OCCUPANCY - PHYSICAL EDUCATION

SIZE: LOWER LEVEL - 19,074 SQUARE FEET
UPPER LEVEL - 6,600 SQUARE FEET

TOTAL SQUARE FEET 25,674 MORE OR LESS

FOUNDATION: POURED REINFORCED CONCRETE

SUPERSTRUCTURE:

FRAME - STRUCTURAL STEEL WITH COLUMNS, BEAMS AND JOISTS

FLOORS - POURED CONCRETE ON GRADE, PRECAST CONCRETE

FLOOR COVER - CARPETING IN OFFICES, FITNESS CENTER; CERAMIC TILE IN SHOWER ROOMS, VINYL ASBESTOS IN CORRIDORS, HARDWOOD IN GYMNASIUM, DANCE ROOM

ROOF STRUCTURE - 2" FIBER ROOF TILE ON STEEL JOISTS

ROOF COVER - BUILT-UP COMPOSITION WITH INSULATION

CEILINGS - ACOUSTICAL TILE IN OFFICES, CLASSROOMS, LOCKER ROOMS CORRIDORS

INTERIOR CONSTRUCTION - BRICK ON BLOCK PARTITIONS INCLUDING BASKETBALL COURT, LOCKER ROOMS, CLASSROOMS OFFICE AND STORAGE ROOMS

BUILT-IN FIXTURES -

1 - ELEVATOR, 2,000 LB. CAPACITY, 2-STOPS

6 - RETRACTABLE BASKETBALL BACKSTOPS

1 - NEVCO ELECTRONIC SCOREBOARD

1 - POWER GYMNASIUM DIVIDER CURTAIN

1 - KITCHENETTE COUNTER

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

PHYSICAL EDUCATION: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
14 - WATER CLOSETS
12 - LAVATORIES
5 - URINALS
2 - SANITARY SINKS
4 - DRINKING FOUNTAINS
8 - SHOWER HEADS
1 - SUPER STORE 120 GALLON WATER STORAGE TANK

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- FLUORESCENT AND INCANDESCENT FIXTURES
- HIGH PRESSURE SODIUM FIXTURES IN GYMNASIUM

HEATING AND AIR CONDITIONING -

1 - AMERICAN STANDARD 10AB 21,000 CFM HORIZONTAL AIR HANDLER UNIT
1 - AMERICAN STANDARD 104 5,400 CFM MULTIZONE VENTILATING UNIT
1 - AMERICAN STANDARD 5,600 CFM VERTICAL VENTILATING UNIT
1 - AMERICAN STANDARD 2,000 CFM VERTICAL VENTILATING UNIT
- PUMPS AS REQUIRED
- M-FLEX ADJUSTABLE SPEED CONTROLLER
1 - LOCHINVAR MODEL KBN800 GAS FIRED DIRECT VENT BOILER # G08H10057992
1 - LOCHINVAR MODEL KBN800 GAS FIRED DIRECT VENT BOILER # G08H10057954

EXTERIOR WALLS - CONCRETE BLOCK
- FACE BRICK AT VESTIBULE ENTRANCE
- DRYVITON BLOCK WALL COVER

MISCELLANEOUS -

1 - FIRE ALARM SYSTEM WITH CONTROL BOX
1 - AUTOMATIC DOOR OPENER
- SPRINKLER SYSTEM THRU-OUT
- ACCESS CONTROL SYSTEM
2 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1969

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: POWERHOUSE
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	30,500.00
SUPERSTRUCTURE:	
FRAME	72,800.00
FLOORS	48,900.00
ROOF STRUCTURE	73,800.00
ROOF COVER	53,000.00
INTERIOR CONSTRUCTION	14,900.00
ELECTRICAL	447,100.00
PLUMBING	46,700.00
HEATING	1,718,400.00
MISCELLANEOUS	8,300.00
EXTERIOR WALLS	319,700.00
TOTAL LABOR AND MATERIALS	2,834,100.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	3,032,500.00
Depreciation %	59%
Sound Valuation	1,243,300.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: POWERHOUSE

KIND OF BUILDING: CLASS C

NO. OF STORIES: ONE

OCCUPANCY - BOILER HOUSE

SIZE: TOTAL SQUARE FEET = 3,580

FOUNDATION: POURED REINFORCED CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL I BEAMS WITH JOISTS AND COLUMNS

FLOORS - CONCRETE ON GRADE

ROOF STRUCTURE - TECTUM DECK ON 18 GALLON BOX

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

INTERIOR CONSTRUCTION - CONCRETE BLOCK RESTROOM PARTITION, 18 X 10'

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
1 - WATER CLOSET
1 - LAVATORY
1 - URINAL
1 - 80-GALLON WATER HEATER
1 - WATER COOLER
1 - SANITARY SINK

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

- POWER WIRING DISTRIBUTION SYSTEM WITH SQUARE D SWITCHBOARD
1 - 500 KVA TRANSFORMER ON PAD

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

POWERHOUSE: continued

HEATING AND AIR CONDITIONING -

1 - CLEAVER BROOKS MODEL CB428-500 PACKAGED BOILER, # 1-80366 2,092,000 BTU INPUT
1 - CLEAVER BROOKS MODEL CB428-700 PACKAGED BOILER, #L42353, 2,929,100 BTU INPUT
1 - CLEAVER BROOKS CR-266-200 PACKAGED BOILER, #L-48323
2 - TRANE UNIT HEATERS
1 - CLEAVER BROOKS MODEL CB-700-50-150 GAS FIRED PACKAGED BOILER # OL106948

MISCELLANEOUS - ACCESS CONTROL SYSTEM

EXTERIOR WALLS - FACE BRICK ON 12" CONCRETE BLOCK
- NORTH ELEVATION WINDOWS IN STEEL SASH
1 - OVERHEAD DOOR METAL/GLASS 12 X 10' HEIGHT

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1963

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: SCHOLARS HALL
REAL ESTATE - BUILDING

Description	11/1/23
BASEMENT:	
FRAME	779,400.00
FLOOR	268,400.00
CEILING	238,700.00
EXTERIOR WALLS	434,700.00
INTERIOR PARTITION	1,569,300.00
ELECTRICAL	783,300.00
FOUNDATION:	519,900.00
SUPERSTRUCTURE:	
FRAME	1,561,900.00
FLOORS	1,075,000.00
FLOOR COVERINGS	750,500.00
CEILINGS	472,300.00
ROOF STRUCTURE	533,000.00
ROOF COVER	298,600.00
INTERIOR CONSTRUCTION	3,146,700.00
BUILT-IN FIXTURES	313,800.00
ELECTRICAL	1,568,400.00
PLUMBING	1,465,000.00
HEATING	2,986,400.00
MISCELLANEOUS	55,500.00
EXTERIOR WALLS	1,472,000.00
FIRE PROTECTION	371,700.00
TOTAL LABOR AND MATERIALS	20,664,500.00
ARCHITECT'S PLANS AND SUPERVISION	7%
Replacement Value New	22,111,000.00
Depreciation %	44%
Sound Valuation	12,382,200.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: SCHOLARS HALL

KIND OF BUILDING: CLASS B

NO. OF STORIES: TWO WITH FULL BASEMENT

OCCUPANCY - CLASSROOMS, LECTURE ROOMS AND OFFICES

SIZE:

BASEMENT	19,996 SQUARE FEET
FIRST FLOOR	20,951 SQUARE FEET
SECOND FLOOR	19,092 SQUARE FEET
TOTAL SQUARE FEET	62,812 MORE OR LESS

FOUNDATION: POURED REINFORCED CONCRETE FOOTINGS

SUPERSTRUCTURE:

FRAME - CONCRETE COLUMNS AND BEAMS WITH REINFORCED CONCRETE

FLOORS - SLAB ON GRADE, PRECAST CONCRETE TEES

FLOOR COVER - CARPET IN OFFICES CORRIDORS AND CLASSROOMS;
VINYL TILE IN LABS

ROOF STRUCTURE - PRECAST CONCRETE TEES

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL THROUGHOUT

INTERIOR CONSTRUCTION - MASONRY AND DRYWALL PARTITIONS

BUILT-IN FIXTURES -

1 - OTIS ELEVATOR, 2,000 LB. CAPACITY WITH 3 STOPS, #40562
120 - WOOD TILT-UP CHAIRS WITH TABLET ARMS
77 - WOOD TILT-UP CHAIRS WITH TABLET ARMS
4 - CORRIDOR BENCHES, VINYL UPHOLSTERY
- RECEPTION WORK STATION
- WORK ROOM CABINETS
- CLASSROOM CABINETS

SCHOLARS HALL: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
14 - WATER CLOSETS
16 - LAVATORIES
6 - URINALS
1 - 80-GALLON WATER HEATER
4 - WATER COOLERS
2 - SANITARY SINKS

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- FLUORESCENT AND INCANDESCENT FIXTURES
2 - 500 KVA TRANSFORMER

HEATING AND AIR CONDITIONING -

1 - TRANE MODEL M-10 AIR HANDLING UNIT
1 - TRANE MODEL M-25 AIR HANDLING UNIT
3 - TRANE MODEL M-17 AIR HANDLING UNITS
1 - TRANE MODEL M-12 AIR HANDLING UNIT
1 - TRANE RTAC ROOFTOP AIR COOLED CHILLER, 160 TON CAPACITY
- STEAM FROM POWERHOUSE
- DIGITAL CONTROLLERS

EXTERIOR WALLS - FACE BRICK ON CONCRETE BLOCK
- WINDOWS IN ALUMINUM SASH
- 6" ALUMINUM CURTAIN WALL SYSTEM

MISCELLANEOUS -

1 - NOTIFIER FIRE ALARM SYSTEM WITH CONTROL BOX
1 - AUTOMATIC DOOR OPENER
- FIRE PROTECTION SPRINKLERS
- ACCESS CONTROL SYSTEM
3 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1963

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE
REAL ESTATE - BUILDING

Bldg.: WEST HALL
INNOVATION CENTER

Description	11/1/23
LOWER LEVEL:	
FRAME	314,700.00
FLOOR	232,200.00
CEILING	180,400.00
EXTERIOR WALLS	350,600.00
INTERIOR PARTITION	1,671,700.00
ELECTRICAL	772,700.00
FOUNDATION:	476,400.00
SUPERSTRUCTURE:	
FRAME	780,000.00
FLOORS	1,330,500.00
FLOOR COVERINGS	604,200.00
CEILINGS	447,700.00
ROOF STRUCTURE	691,300.00
ROOF COVER	270,400.00
INTERIOR CONSTRUCTION	4,103,500.00
BUILT-IN FIXTURES	870,600.00
ELECTRICAL	1,915,200.00
PLUMBING	1,670,300.00
HEATING	4,684,600.00
MISCELLANEOUS CONSTRUCTION	268,400.00
EXTERIOR WALLS	1,677,900.00
TOTAL LABOR AND MATERIALS	23,313,300.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	24,945,200.00
Depreciation %	12%
Sound Valuation	21,951,800.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: WEST HALL INNOVATION CENTER

KIND OF BUILDING: CLASS B/C

NO. OF STORIES: TWO WITH LOWER LEVEL, PENT HOUSE

OCCUPANCY - STUDENT CENTER, CAFETERIA, OFFICES AND LIBRARY

SIZE:

LOWER LEVEL	19,063 SQUARE FEET
FIRST FLOOR	32,065 SQUARE FEET
SECOND FLOOR	12,126 SQUARE FEET
PENT HOUSE	3,050 SQUARE FEET
TOTAL SQUARE FEET	66,304

FOUNDATION: CONCRETE FOOTINGS

SUPERSTRUCTURE:

FRAME - CONCRETE COLUMNS AND BEAMS
- STEEL

FLOORS - 4" CONCRETE SLAB ON GRADE, 2" CONCRETE TOPPING ON DOX PLANK; STEEL JOIST, METAL DECK, CONCRETE TOPPING

FLOOR COVER - CARPET TILE, QUARRY TILE IN KITCHEN, PLANK TILE

ROOF STRUCTURE - 6" DOX PLANK-PRECAST CONCRETE
- SKYLIGHTS AT COMMONS AREA

ROOF COVER - SINGLE PLY MEMBRANE WITH RIGID INSULATION

CEILINGS - SUSPENDED ACOUSTICAL TILE; GYPSUM BOARD

INTERIOR CONSTRUCTION - MASONRY PARTITIONS, AND FRAME PARTITIONS

BUILT-IN FIXTURES -
1 - HOBART CLPS66LN AUTOMATIC DISHWASHER WITH STAINLESS STEEL DRAINBOARD AND DISPOSAL
1 - RANGE VENTILATION HOOD, 13' X 60" WITH EXTINGUISHING SYSTEM
1 - RANGE VENTILATION HOOD, 13' X 54" WITH EXTINGUISHING SYSTEM
1 - COFFEE STATION STAINLESS STEEL WITH SINK, 120" X 30"
1 - TRAULSEN 2-DOOR PASS THRU FOOD WARMER
1 - STAINLESS STEEL 3 BASIN POT SINK
3 - STAINLESS STEEL PREP TABLE, 96" X 30"
- STAINLESS STEEL TABLE WITH SINK, 120" X 30"

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

WEST HALL INNOVATION CENTER: continued

BUILT-IN FIXTURES - continued
1 - 3 COMPARTMENT STAINLESS STEEL SINK, 48" X 19"
1 - WALK-IN FREEZER, 16' X 9'
1 - MONTGOMERY 4,000 LB. ELEVATOR WITH 2-STOPS
1 - STAINLESS STEEL TABLE, 120" X 30"
- LAMINATE SALES COUNTERS IN BOOKSTORE
1 - COFFEE COUNTER, LAMINATE WITH CORIAN TOP, REFRIDGERATED DISPLAY CASE
1 - DELI WELCOME COUNTER, IRREGULAR SHAPED WITH HOT FOOD WELL (4) COLD FOOD WELL (4), BREATH PROTECTOR
8 - HAND SINKS, STAINLESS STEEL
- SALAD BAR COUNTER, LAMINATE WITH 3 COLD FOOD WELLS, BREATH PROTECTOR, CORIAN TOP
7 - LOCKERS
- SOILED DISH TABLE, STAINLESS STEEL
9 - SHELVES, STAINLESS STEEL
1 - KOLPAK WALK-IN REFRIGERATOR, 10 X 16'
- CIRCULATION DESK CASE WORK, LAMINATE, CORIAN TOP
1 - STAINLESS STEEL RANGE HOOD WITH EXTINGUISHER SYSTEM, 54" X 60"
1 - STAINLESS STEEL RANGE HOOD WITH EXTINGUISHER SYSTEM, 10' X 5'
1 - BEVERAGE WALK-IN COOLER, 23' X 7'9" X 8'6", 7 GLASS DOORS
1 - OPEN SHELF COUNTER, LAMINATE, CORIAN TOP, 64" X 25"
1 - MOBILFLEX GATE
1 - STAINLESS STEEL COUNTER, LAMINATE BASE, 2 SINKS, 14.5' X 30"
1 - COUNTER, STAINLESS STEEL LEGS, CORIAN TOP, 78" X 30"
1 - COUNTER, STAINLESS STEEL LEGS, CORIAN TOP, 28" X 30"
8 - BOOTHES, VINYL UPHOLSTERED, 78" X 36"
2 - WELCOME DESK, L SHAPE, LAMINATE, CORIAN TOP, 14 LINEAR FEET
6 - BOOTHES, VINYL UPHOLSTERED, 82" X 36"
1 - BASE CABINET, 3 DOOR, LAMINATE, CORIAN TOP, 82" X 24"
1 - FIREPLACE, GAS FIRED, 72" WIDE
1 - BOOKCASE, LAMINATE, 60" X 14" X 96"
1 - BOOKCASE, LAMINATE, 120" X 14" X 96"
1 - BOOKCASE, LAMINATE, 30" X 14" X 96"
1 - BASE COUNTER WITH STAINLESS STEEL SINK, CORIAN TOP, 111" X 25"
1 - WALL CABINET, LAMINATE, 111" X 12" X 30"
1 - BOOKCASE, LAMINATE, GLASS DOORS, 48" X 14" X 96"
1 - KONE ELEVATOR 3 STOP. 3500 LB. CAPACITY

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
19 - WATER CLOSETS
15 - LAVATORIES
7 - URINALS
3 - SANITARY SINKS
1 - WATER HEATER
3 - DRINKING FOUNTAIN/BOTTLE FILLER

REAL ESTATE - BUILTING NORTHWESTERN MICHIGAN COLLEGE

WEST HALL INNOVATION CENTER: continued

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- IT CABLE
- FIRE ALARM SYSTEM

HEATING AND AIR CONDITIONING - STEAM HEAT FROM POWERHOUSE
3 - LOCHINVAR MODEL FTXL850, GAS FIRED BOILER
1 - RENEWAIRE MODEL HE3X1NV, ENERGY RECOVERY VENTILATOR INDOOR UNIT
1 - TRANE MODEL CSAA-80, AIR HANDLING UNIT, #AHU-1
1 - TRANE MODEL CSAA-25 AIR HANDLER UNIT, #AHU-2
1 - TRANE MODEL CSAA-10 AIR HANDLER UNIT, #AHU-3
1 - MITSUBISHI MODEL MSY-GL18NA, MINI-SPLIT SYSTEM
- SNOW MELT SYSTEM
- PUMPS AS REQUIRED
- GEOTHERMAL SYSTEM

EXTERIOR WALLS - FACE BRICK ON CONCRETE BLOCK
- ALUMINUM CURTAIN WALL
- SOLID CORE ACM RAINSCREEN SYSTEM WITH DRY-LOC JOINTS
- KAWNEER SUN SHADE SYSTEM
- 4" HORIZONTAL INSULATED METAL PANEL SYSTEM
- ALUMINUM STOREFRONT
- BRICK VENEER, METAL STUDS

MISCELLANEOUS -
- FIRE SPRINKLERS THROUGHOUT
1 - PUBLIC ADDRESS SYSTEM, PUBLIC AREAS
1 - RADIO BROADCAST ANTENNA, 100'
1 - METAL OVERHEAD DOOR WITH DOCK LEVELER
- ACCESS CONTROL SYSTEM

QUALITY OF CONSTRUCTION: VERY GOOD

BUILT: 1963
KITCHEN AND BOOKSTORE ADDITION 2003
ADDITION AND RENOVATION 2019 AND 2020

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING
Bldg.: UNIVERSITY CENTER CAMPUS BOARDMAN LAKE

Description	11/1/23
FOUNDATION:	461,400.00
SUPERSTRUCTURE:	
FRAME	1,021,800.00
FLOORS	1,545,000.00
FLOOR COVERINGS	777,200.00
CEILINGS	625,600.00
ROOF STRUCTURE	468,700.00
ROOF COVER	307,900.00
INTERIOR CONSTRUCTION	4,418,200.00
BUILT-IN FIXTURES	228,200.00
ELECTRICAL	2,346,700.00
PLUMBING	1,452,600.00
HEATING	1,894,800.00
MISCELLANEOUS CONSTRUCTION	557,300.00
EXTERIOR WALLS	2,053,500.00
TOTAL LABOR AND MATERIALS	18,158,900.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	19,430,000.00
Depreciation %	34%
Sound Valuation	12,823,800.00

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: UNIVERSITY CENTER CAMPUS/BOARDMAN LAKE

KIND OF BUILDING: CLASS C

NO. OF STORIES: THREE

OCCUPANCY - OFFICE RENTAL, CLASSROOMS, OFFICES

SIZE:

TOTAL SQUARE FEET 59,460 MORE OR LESS

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON GROUND; STEEL PAN CONCRETE SLAB

FLOOR COVER - CARPET IN CLASSROOMS, OFFICES, CORRIDORS;
- CERAMIC TILE RESTROOMS
- VINYL TILE

ROOF STRUCTURE - STEEL JOIST, STEEL DECK

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL TILE; GYPSYM BOARD

INTERIOR CONSTRUCTION - METAL FRAME PARTITIONS
- MASONRY PARTITIONS

BUILT-IN FIXTURES -

- KITCHEN CABINETS, LAMINATE WITH STAINLESS STEEL SINK

- OAK CREDENZAS, WALL MOUNTED

- LAMINATE BASE CABINETS

- MONTGOMERY HYDRAULICALLY OPERATED ELEVATOR, 3-STOP, 2,000 LB. CAPACITY #23504

- ADDITIONAL STOP FOR EXISTING OTIS ELEVATOR, 2100 LB. CAPACITY, #30485

- FOLDING PARTITION, 32 X 9', ROOMS 202 / 203

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

UNIVERSITY CENTER CAMPUS/BOARDMAN LAKE: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
33 - WATER CLOSETS
28 - LAVATORIES
9 - URINALS
6 - SANITARY SINKS
6 - WATER COOLERS
1 - HOT WATER HEATER, 85-GALLON

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- TRANSFORMER

HEATING AND AIR CONDITIONING -
- MC QUAY AIR HANDLING UNIT
- MC QUAY AIR COOLED CONDENSING UNIT
- RITE MODEL 150 WATER HEATING BOILER, GAS FIRED
- PUMPS AS REQUIRED
- TRANE GAS FIRED ROOFTOP HEATING AND AIR CONDITIONING UNIT
2 - RAYPACK MODEL H3-0514A GAS FIRED BOILER
1 - LIEBERT AIR CONDITIONER
1 - LIEBERT CONDENSING UNIT
- MC QUAY MODEL LSL-108 MAKE-UP AIR UNIT
- SNYDER - GENERAL MODEL ALP037C AIR CONDITIONING UNIT #5VM0507000
- VAV'S AND CONTROLS
1 - NIMBUS VIRGA III COOLING TOWER
26 - TRANE WATER FURANCE HEAT PUMP

EXTERIOR WALLS - FACE BRICK, BLOCK BACK-UP 12"
- STEEL STUD WALLS, T & G CEDAR SIDING
- 1" INSULATED GLASS, ALUMINUM FRAME

MISCELLANEOUS - FIRE SPRINKLERS THRU OUT
- FIRELITE FIRE ALARM AND SECURITY SYSTEM
1 - AUTOMATIC DOOR OPENER
1 - BERGEY WINDPOWER WIND TURBINE WITH 70'18" TRIANGULAR GUYED TOWER, CABLE TO BUILDING, FOUNDATION,POWER INVERTER
- ACCESS CONTROL SYSTEM
5 - CAMERA SECURITY SYSTEM
- SPRINKLER SYSTEM MODIFIED FOR PUBLIC SCHOOL

QUALITY OF CONSTRUCTION: VERY GOOD

BUILT: 1986; THIRD FLOOR OVER 1995 ADDITION, 2000.

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: UTILITY TUNNELS
REAL ESTATE - BUILDING

Description	11/1/23

APPROXIMATELY 6,925 SQUARE FEET OR 54,100 CUBIC FEET

STEAM TUNNELS CONNECTING BUILDINGS SERVICED BY CENTERAL HEATING SYSTEM

- INCLUDING LIGHTING AND DRAINAGE

- REINFORCED CONCRETE CONSTRUCTION

Replacement Value New	2,741,500.00
Depreciation %	56%
Sound Valuation	1,206,300.00

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: MAINTENANCE
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	155,100.00
SUPERSTRUCTURE:	
FRAME	131,700.00
FLOORS	153,100.00
FLOOR COVERINGS	20,700.00
CEILINGS	20,700.00
ROOF COVER	91,700.00
INTERIOR CONSTRUCTION	153,800.00
BUILT-IN FIXTURES	56,200.00
ELECTRICAL	154,200.00
PLUMBING	106,600.00
HEATING	47,000.00
MISCELLANEOUS CONSTRUCTION	125,700.00
EXTERIOR WALLS	172,000.00
TOTAL LABOR AND MATERIALS	1,388,500.00
ARCHITECT'S PLANS AND SUPERVISION	5%

Replacement Value New	1,457,900.00
Depreciation %	22%
Sound Valuation	1,137,200.00

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: MAINTENANCE

KIND OF BUILDING: CLASS S

NO. OF STORIES: ONE

OCCUPANCY - MAINTENANCE/STORAGE

TOTAL SQUARE FEET = 11,900

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - 6" REINFORCED CONCRETE OVER VAPOR BARRIER ON COMPACTED SAND

FLOOR COVER - VINYL COMPOSITION TILE;
- CARPET

ROOF STRUCTURE - STEEL

ROOF COVER - STANDING SEAM METAL ROOF WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL TILE; DRYWALL

INTERIOR CONSTRUCTION - FRAME PARTITIONS

BUILT-IN FIXTURES -

11 LINEAR FEET OF PLASTIC LAMINATE BASE CABINETS WITH LAMINATE TOP, CONFERENCE ROOM

11 LINEAR FEET OF PLASTIC LAMINATE WALL CABINETS, - CONFERENCE ROOM

7 LINEAR FEET OF PLASTIC LAMINATE BASE CABINET WITH SINK, LAMINATE TOP, - LUNCH ROOM

7 LINEAR FEET OF PLASTIC LAMINATE WALL CABINETS, - LUNCH ROOM

19 - LOCKERS

- TOILET PARTITIONS

6 - MINI BLINDS

175 - LINEAR FEET OF CYCLONE FENCE, 10' HEIGHT WITH 3 SWING GATES

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

MAINTENANCE: continued

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
4 - WATER CLOSETS
2 - LAVATORIES
1 - URINALS
1 - SANITARY SINKS
1 - ELECTRIC WATER COOLER
1 - HOT WATER HEATER
2 - SHOWER STALLS

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- FLUORESCENT FIXTURES
- 400 WATT HIGH BAY FIXTURES

HEATING AND AIR CONDITIONING -
2 - REZNOR MODEL FE250 GAS FIRED SUSPENDED UNIT HEATERS
1 - PHILCO MODEL 5-TON CONDENSING UNIT
1 - PHILCO GAS FIRED FORCED AIR FURNACE WITH AIR CONDITIONING

EXTERIOR WALLS - DECORATIVE BLOCK
- METAL SIDING WITH INSULATION
2 - 12 X 10' METAL OVERHEAD DOORS

MISCELLANEOUS - FIRE SUPPRESSION SYSTEM
- ACCESS CONTROL SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 2001

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: LANDSCAPE BIN
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	8,400.00
SUPERSTRUCTURE:	
FRAME	4,100.00
FLOORS	8,300.00
ROOF STRUCTURE	6,200.00
ROOF COVER	6,400.00
EXTERIOR WALLS	10,500.00

Replacement Value New	43,900.00
Depreciation %	22%
Sound Valuation	34,200.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: LANDSCAPE BINS

KIND OF BUILDING: CLASS D

NO. OF STORIES: ONE

OCCUPANCY: STORAGE

DIMENSIONS - 45' X 15' X 8'/11' HEIGHT
- 60' X 20' X 11'/18' HEIGHT

TOTAL SQUARE FEET = 675

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - WOOD

FLOORS - CONCRETE ON SAND FILL

ROOF STRUCTURE - OPEN WOOD

ROOF COVER - METAL PANELS

INTERIOR CONSTRUCTION - FRAME PARTITIONS

EXTERIOR WALLS - WOOD

QUALITY OF CONSTRUCTION: GOOD

BUILT - 2001

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING
Bldg.: AUTOMOTIVE SERVICE TECHNOLOGY

Description	11/1/23
FOUNDATION:	143,900.00
SUPERSTRUCTURE:	
FRAME	327,200.00
FLOORS	250,000.00
FLOOR COVERINGS	43,100.00
CEILINGS	32,600.00
ROOF STRUCTURE	256,500.00
ROOF COVER	268,400.00
INTERIOR CONSTRUCTION	910,100.00
BUILT-IN FIXTURES	9,000.00
ELECTRICAL	661,500.00
PLUMBING	380,200.00
HEATING	176,300.00
MISCELLANEOUS CONSTRUCTION	256,100.00
EXTERIOR WALLS	658,500.00
TOTAL LABOR AND MATERIALS	4,373,400.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	4,679,500.00
Depreciation %	39%
Sound Valuation	2,854,500.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: AUTOMOTIVE SERVICE TECHNOLOGY

KIND OF BUILDING: CLASS C/S

NO. OF STORIES: ONE

OCCUPANCY - CLASSROOMS/TECHNOLOGY

TOTAL SQUARE FEET 18,328

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON SAND FILL

FLOOR COVER - CONCRETE SEALER
VINYL COMPOSITION TILE
CARPET

ROOF STRUCTURE - STEEL - STEEL JOISTS, METAL DECK

ROOF COVER - METAL STANDING SEAM WITH INSULATION
- BUILT UP COMPOSITION WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL TILE

INTERIOR CONSTRUCTION - MASONRY AND FRAME PARTITIONS;

BUILT-IN FIXTURES -
95 LINEAR FEET OF CYCLONE FENCE, 8' HEIGHT WITH 3 SWING GATES

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
4 - WATER CLOSETS
4 - LAVATORIES
1 - URINALS
1 - ELECTRIC WATER COOLER
1 - WASH FOUNTAIN
1 - WATER HEATER

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

AUTOMOTIVE SERVICE TECHNOLOGY: continued

MECHANICAL EQUIPMENT:

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES; FIRE ALARM SYSTEM

HEATING AND AIR CONDITIONING -
- VANTAGE II GAS FIRED SUSPENDED RADIANT HEAT
2 - EXHAUST WALL FANS
- ROOFTOP GAS HEATING UNIT WITH AIR CONDITIONING

EXTERIOR WALLS - FACE BRICK, BLOCK BACKUP
- 8" BLOCK
- METAL SIDING WITH INSULATION
3 - 14 X 12' OVERHEAD DOORS, METAL, ELECTRIC OPENER
1 - 16 X 12' OVERHEAD DOOR, METAL, ELECTRIC OPENER
1 - 14 X 14' OVERHEAD DOOR, METAL, ELECTRIC OPENER

MISCELLANEOUS: - AUTOMATIC FIRE SUPPRESSION SYSTEM
- COMPRESSED AIR SYSTEM
- VEHICLE EXHAUST FUME SYSTEM WITH 12 HOSE DROPS 3000 CFM CAPACITY
- ACCESS CONTROL SYSTEM
2 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 1982

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE REAL ESTATE - BUILDING Bldg.: GREAT LAKES CAMPUS

Description	11/1/23
FOUNDATION:	632,000.00
SUPERSTRUCTURE:	
FRAME	1,468,000.00
FLOORS	1,858,900.00
FLOOR COVERINGS	1,099,900.00
CEILINGS	296,100.00
ROOF STRUCTURE	811,500.00
ROOF COVER	1,761,700.00
INTERIOR CONSTRUCTION	5,106,500.00
BUILT-IN FIXTURES	3,516,000.00
ELECTRICAL	3,328,600.00
PLUMBING	1,364,000.00
HEATING	3,570,000.00
MISCELLANEOUS	92,800.00
EXTERIOR WALLS	4,074,600.00
FIRE PROTECTION	354,100.00
TOTAL LABOR AND MATERIALS	29,330,700.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	31,383,800.00
Depreciation %	20%
Sound Valuation	25,107,000.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: GREAT LAKES CAMPUS

KIND OF BUILDING: CLASS C

NO. OF STORIES: TWO WITH PENTHOUSE

OCCUPANCY: MARITIME ACADEMY, CULINARY ARTS, CONFERENCE CENTER

SIZE: FIRST FLOOR 35,670 SQUARE FEET
SECOND FLOOR 33,050 SQUARE FEET
PENTHOUSE 6,644 SQUARE FEET

TOTAL SQUARE FEET = 75,364

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON GROUND, VAPOR BARRIER
- STEEL, CONCRETE FLOOR ON STEEL DECK

FLOOR COVERINGS - VINYL TILE
- CARPET
- CERAMIC TILE
- CARPET TILE
- LINOLEUM TILE
- THINSET TERRAZZO FLOORING

ROOF STRUCTURE - LOWER ROOF, STEEL LONG SPAN BAR JOIST, STEEL DECK
- UPPER OOR, LIGHT GAUGE MONO-TRUSSES, METAL DECK

ROOF COVER - STANDING SEAM METAL DECK, INSULATION, VAPOR BARRIER
ICE AND WATER SHIELD AT EAVE
EPDM MEMBRANE WITH INSULATION
PREFINISHED ENGINEERED SNOW RETENTION SYSTEM

CEILINGS - GYPSUM BOARD
- ACOUSTICAL CEILING TILE
- GLASS

INTERIOR CONSTRUCTION - MASONARY AND FRAME PARTITIONS

BUILT-IN FIXTURES -
INTRO LAB:
4 - PREP TABLES, STAINLESS STEEL WITH SINK
1 - EXHAUST HOOD WITH FIRE PROTECTION SYSTEM
2 - POT SINKS, 3 COMPARTMENT, STAINLESS STEEL
1 - PREP TABLE, STAINLESS STEEL, 2 COMPARTMENT SINK

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

GREAT LAKES CAMPUS - continued

BUILT-IN FIXTURES - continued
INTRO LAB: continued
4 - HAND SINKS, STAINLESS STEEL
1 - COOKS TABLE, WITH SINK, STAINLESS STEEL

GARDE MGR LAB:
1 - EXHAUST HOOD WITH FIRE PROTECTION SYSTEM
2 - COOKS TABLE, STAINLESS STEEL WITH SINK, UTENSIL RACK, DOUBLE FACE
2 - WORK TABLES, STAINLESS STEEL WITH REFRIGERATED BASE, SINK
1 - POT SINK, 3 COMPARTMENT, STAINLESS STEEL
2 - HAND SINKS, STAINLESS STEEL

BAKERY LAB:
1 - WALK-IN COOLER
1 - WALK-IN FREEZER
2 - FIRE PROTECTION SYSTEMS
1 - PREP TABLE, STAINLESS STEEL, SINK, WATER METER/FILLER
1 - PREP TABLE, 2 COMPARTMENT SINK, STAINLESS STEEL, DISPOSAL
3 - HAND SINKS, STAINLESS STEEL
1 - POT SINK, 3 COMPARTMENT STAINLESS STEEL SINK, DISPOSAL, POT WASHER
1 - EXHAUST HOOD, STAINLESS STEEL WITH FIRE PROTECTION SYSTEM

FIRST FLOOR CONFERENCE DEMO KITCHEN:
1 - WALK-IN COOLER
1 - PREP TABLE, STAINLESS STEEL WITH SINK
1 - EXHAUST HOOD WITH FIRE PROTECTION SYSTEM
1 - DEMO TABLE, STAINLESS STEEL, SINK, MIRROR
1 - PLATING TABLE, STAINLESS STEEL
1 - UTILITY COUNTER, STAINLESS STEEL
2 - ICE BIN AND WATER FILLER, STAINLESS STEEL
4 - HAND SINKS, STAINLESS STEEL
1 - POT SINK, 3 COMPARTMENT, STAINLESS STEEL
1 - HOBART DISHWASHER WITH BOOSTER HEATER, DISPOSAL
1 - DISHWASHER HOOD WITH EXHAUST FAN, STAINLESS STEEL

ADVANCED COOLING LAB/SECOND FLOOR:
1 - WALK-THRU COOLER
2 - PREP TABLES, STAINLESS STEEL WITH SINK, 8'
2 - PREP TABLES, STAINLESS STEEL WITH SINK, 7 X 5'
1 - EXHAUST HOOD WITH FIRE PROTECTION SYSTEM
1 - FRONT SERVICE COUNTER
1 - BAKERY DISPLAY CASE
1 - HOT FOOD TABLE
3 - REFRIGERATED BASE
1 - UTILITY COUNTER
1 - UTILITY COUNTER WITH SINK
1 - BEVERAGE COUNTER 'L' SHAPE, 16'

GREAT LAKES CAMPUS: continued

BUILT-IN FIXTURES - CONTINUED

ADVANCED COOKING LAB/ SECOND FLOOR: continued
2 - DISH TABLES, STAINLESS STEEL FOR DISHWASHER WITH SINK
1 - POT SINK, 3 COMPARTMENT, STAINLESS STEEL
1 - HOBART DISHWASHER WITH DISPOSAL
1 - DISHWASHER HOOD WITH EXHAUST FAN
1 - HOSE SPRAY UNIT
1 - SERVICE STATION, "L" SHAPE, STAINLESS STEEL TOP, 35 L.F.
1 - FRONT BAR
1 - BAR SERVICE STATION AND ICE BIN
2 - PERLICK BLENDER STATIONS
1 - PERLICK REFRIGERATED BACK BAR
5 - PERLICK DRAINBOARDS
2 - PERLICK ICE BIN AND SPEED RAILS
1 - BAR SINK
5 - CORNER FILLERS, STAINLESS STEEL
1 - "U" SHAPE CARIAN TOP FRONT BAR, 60 L.F.

MARITIME ACADEMY:
1 - EXHAUST FUME HOOD
15 - LOCKERS, 2 TIER
1 - OTIS ELEVATOR, 2 STOP
2 - ROLLING DOORS, METAL, 24 X 10'
3 - ROLLING DOORS, METAL, 78 X 120"
1 - ROLLING DOOR, METAL, 10 X 10'
1 - ROLLING DOOR, METAL, 15 X 10'
3 - MOVABLE PARTITIONS, 48'

CULINARY ARTS:
1 - OTIS ELEVATOR, 2-STOP
1 - WALK-IN FREEZER
2 - WALK-IN COOLERS

PLUMBING - AN MODERN SYSTEM OF SANITARY FIXTURES CONSISTING OF:
36 - WATER CLOSETS
30 - LAVATORIES
13 - URINAL
5 - JANITOR SINKS
12 - DRINKING FOUNTAINS
3 - SHOWERS
2 - STORAGE TANKS, 752 GALLON CAPACITY
3 - HELLEN BRAND MODEL H200M, WATER CONDITIONING SYSTEM

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
- EMERGENCY LIGHTING

GREAT LAKES CAMPUS: continued

HEATING AND AIR CONDITIONING -

1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476412
12 - TRANE FNB04 CABINET UNIT HEATERS
3 - TRANE 90S UNIT HEATERS
4 - B & G HEATING EXCHANGERS
1 - TRANE MCC-40 AIR HANDLING UNIT, AHU-1
1 - TRANE MCC-40 AIR HANDLING UNIT, AHU-2
1 - TRANE MCC-25 AIR HANDLING UNIT, AHU-3
1 - TRANE MCC-35 AIR HANDLING UNIT, AHU-4
1 - TRANE MCC-40 AIR HANDLING UNIT, AHU-5
1 - TRANE RAUCC304 ROOFTOP CONDENSING UNIT, CU-3
1 - TRANE RAUCC504 ROOFTOP CONDENSING UNIT, CU-2
1 - TRANE RAUCC504 ROOFTOP CONDENSING UNIT, CU-1
1 - TRANE ROOFTOP CONDENSING UNIT, CU-4
1 - TRANE ROOFTOP CONDENSING UNIT, CU-5
2 - HEATWAY 1574 SNOW MELTING RADIANT FLOOR SYSTEM
87 - TRANE VAV BOXES (VARIABLE AIR VOLUME)
1 - DUO-AIRE MODEL CAA-2D ROOFTOP DIRECT GAS INDUSTRIAL MAKE-UP AIR UNIT, #565605B
1 - DUO-AIRE MODEL CAA-3D ROOFTOP DIRECT GAS INDUSTRIAL MAKE-UP AIR UNIT, #565605
1 - DUO-AIRE MODEL CAA-1D ROOFTOP DIRECT GAS INDUSTRIAL MAKE-UP AIR UNIT, #565605
1 - DUO-AIRE MODEL CAA-2D ROOFTOP DIRECT GAS INDUSTRIAL MAKE-UP AIR UNIT, #565605
1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476415
1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476426
1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476414
1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476425
1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476431
1 - LOCHINVAR MODEL FTX850N-M13, GAS FIRED TUBE BOILER, #1639103476428
- DIGITAL CONTROLLERS

EXTERIOR WALLS - FACE BEICK, BLOCK BACK-UP
7-1/2" STRUCTURAL CURTAIN WALL SYSTEM
WITH 1" INSULATED GLAZING UNITS
OVERHEAD DOOR, GLASS/METAL
WITH ELECTRIC OPERATOR, 20 X 16'

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

GREAT LAKES CAMPUS: continued

MISCELLANEOUS:
- MARITIME ACADEMY DECK, STEEL FRAME, CONCRETE ON METAL DECK 1,262 SQUARE FEET
- CULINARY ARTS DECK, STEEL FRAME, CONCRETE ON METAL DECK, 460 SQUARE FEET
- ACCESS CONTROL SYSTEM
- CAMERA SECURITY SYSTEM

FIRE PROTECTION - FIRE PROTECTION SPRINKLERS

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: AERO PARK LAB
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	224,200.00
SUPERSTRUCTURE:	
FRAME	698,100.00
FLOORS	273,500.00
FLOOR COVERINGS	31,000.00
CEILINGS	15,700.00
ROOF STRUCTURE	466,300.00
ROOF COVER	421,700.00
INTERIOR CONSTRUCTION	656,600.00
BUILDING FIXTURES	65,100.00
ELECTRICAL	930,600.00
PLUMBING	378,100.00
HEATING	262,300.00
MISCELLANEOUS CONSTRUCTION	590,100.00
EXTERIOR WALLS	557,800.00
TOTAL LABOR AND MATERIALS	5,571,100.00
ARCHITECT'S PLANS AND SUPERVISION	6%

Replacement Value New	5,905,400.00
Depreciation %	41%
Sound Valuation	3,484,200.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: AERO PARK LAB

TYPE OF BUILDING: CLASS C

NO. OF STORIES: ONE

OCCUPANCY: LABORATORY WITH CLASSROOM

TOTAL SQUARE FEET = 29,600, MORE OR LESS

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL
- CRANEWAY

FLOORS - CONCRETE ON GROUND

FLOOR COVERINGS - CARPET AND CERAMIC TILE

CEILINGS - SUSPENDED ACDUSTICAL CEILING SYSTEM WITH EDGE TRIM, OFFICES

ROOF STRUCTURE - STEEL JOIST, METAL DECK

ROOF COVER - SINGLE PLY MEMBRANE WITH INSULATION

INTERIOR CONSTRUCTION - MASONRYAND FRAME PARTITIONS; STORE FRONT

BUILT-IN FIXTURES -
1 - COFFEE BAR, L SHAPE, LAMINATE, 15'6" X 8'4"
1 - BASE CABINET, LAMINATE, 3-DOOR/4-DRAWER WITH STAINLESS STEEL SINK
1 - WALL CABINET, LAMINATE, 2-DOOR WITH SHELF 66" X 16" X 24"
1 - PALLET RACKING SYSTEM
- TOILET PARTITIONS
3 - ROLLING DOORS, METEL, 8' X 8'

PLUMBING - AN APPROVED SYSTEM OF SANITARY FIXTURES CONSISTING OF:
7 - WATER CLOSET
8 - LAVATORY
3 - URINAL
1 - SANITARY SINK
1 - SHOWER
4 - ELECTRIC WATER COOLER
1 - WATER HEATER

AERO PARK LAB: continued

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
2000 AMP SWITCHBOARD
- SOLAR PANEL ARRAY, 3.6 KW

HEATING AND AIR CONDITIONING

1 - ABSOLUTAIRE MODEL AA6UMXDX, GAS DIRECT FIRED MAKE-UP AIR UNIT #25581
2 - AMANA HEAT PUMP SPLIT SYSTEM WITH CONDENSING AMBIENT PACKAGE
1 - RENEWAIRE MODEL HE2XRT ENERGY RECOVERY VENTILATOR
1 - FUJITSU MODEL PKA-A12GA DUCTLESS AIR CONDITIONER
1 - FUJITSU MODEL PVY-A12NHA CONDENSING UNIT
1 - BERKO MODEL SRA-2020DSAG ELECTRIC HEATER
5 - EXHAUST FANS
2 - AMERICAN STANDARD FREEDOM 95 DIRECT VENT GAS FURANCE
1 - ENERGY KNIGHT DUCTLESS AIR CONDITIONER
1 - SUSPENDEDGAS FIRED UNIT HEATER
1 - TRANE MODEL 4TTA3048D4000CA, CONDENSING UNIT, #152452UE3F

EXTERIOR WALLS - FACE BRICK, BLOCK BACK-UP
- HORIZONTAL RIBBED METAL, METAL FRAME
- METAL SIDING WITH INSULATION
- OVERHEAD DOORS

MISCELLANEOUS - AUTOMATIC FIRE SUPPRESSION SYSTEM
1 - AURORA 5 TON BRIDGE CRANE, 60' SPAN WITH YALE HOIST
1 - MEZZANINE WITH STAIRCASE
- ACOUSTICAL BAFFLES
- SKYSTREAM 3-7 WIND TURBINE, 45' TOWER
- GE EST FIRE ALARM SYSTEM
13 - WELDING BOOTHS MASONRY WITH FUME, HOODS, EXHAUST DUCT
1 - CRIB FENCE, 31 LINEAR FEET X 8' HEIGHT
1 - ATLAS COPCO MODEL GX7P, ROTARY SCREW AIR COMPRESSOR
- ACCESS CONTROL SYSTEM
12 - DOUBLE FACE WELDING BOOTHS WITH LIGHTS EXHAUST
3 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD, LEED CERTIFIED

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE
REAL ESTATE - BUILDING

Bldg.: PARSEN-STULLEN
M-TEC

Description	11/1/23
FOUNDATION:	475,000.00
SUPERSTRUCTURE:	
FRAME	1,781,500.00
FLOORS	1,105,500.00
FLOOR COVERINGS	996,600.00
CEILINGS	495,400.00
ROOF STRUCTURE	619,600.00
ROOF COVER	771,400.00
INTERIOR CONSTRUCTION	2,704,200.00
BUILT-IN FIXTURES	809,100.00
ELECTRICAL	2,337,600.00
PLUMBING	1,266,700.00
HEATING	2,965,600.00
MISCELLANEOUS CONSTRUCTION	2,082,900.00
EXTERIOR WALLS	2,050,900.00
TOTAL LABOR AND MATERIALS	20,461,000.00
ARCHITECT'S PLANS AND SUPERVISION	7%

Replacement Value New	21,893,300.00
Depreciation %	23%
Sound Valuation	16,857,800.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: PARSEN-STULLEN M-TEC

KIND OF BUILDING: CLASS C

NO. OF STORIES: TWO

OCCUPANCY - CLASSROOM

SIZE: FIRST FLOOR 42,800 SQUARE FEET
SECOND FLOOR 22,200 SQUARE FEET

TOTAL SQUARE FEET - 65,000

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - CONCRETE ON GROUND, 5 1/2" SLAB ON METAL DECK, STEEL JOISTS

FLOOR COVER - RESILIANT TILE
- CERAMIC TILE
- TERRAZZO
- CARPET

ROOF STRUCTURE - PRE-ENGINEERED BOW SPRING STEEL ROOF TRUSSES STEEL JOIST, METAL DECK
ROOF COVER - SNAP-ON STANDING SEAM CURVED METAL ROOFING, PLYWOOD DECK WITH INSULATION
- SINGLE PLY MEMBRANE WITH INSULATION

CEILINGS - SUSPENDED ACOUSTICAL PANELS
- SUSPENDED GYPSUM BOARD
- SUSPENDED PREFORMED FLUSH ALUMINUM PANELS
- SUSPENDED ALUMINUM PANELS
- SUSPENDED VINYL FACED GYPSUM PANELS

INTERIOR CONSTRUCTION - MASONRY AND FRAME PARTITION

BUILT-IN FIXTURES -

- 350 LINEAR FT. OF LAMINATE BASE CABINETS
- 225 LINEAR FT. OF LAMINATE WALL CABINETS
1 - INFORMATION DESK, LAMINATE, 20 LINEAR FT.
1 - INFORMATION DESK, LAMINATE, 13 LINEAR FT.
5 - FOLDING PARTITIONS, 28 X 9'
- LOT OF VISUAL DISPLAY BOARDS

REAL ESTATE - BUILDING - NORTHWESTERN MICHIGAN COLLEGE

M-TEC: continued

BUILT-IN FIXTURES - continued
1 - STAINLESS STEEL SINK WITH DRAINBOARD, DISPOSAL, DISHWASHER
1 - DOUBLE COMPARTMENT SINK, STAINLESS STEEL
1 - TV CABINET, LAMINATE, 48 X 24 X 84"
10 - WARDROBE CABINETS, LAMINATE, 42 X 24 X 84"
1 - ISLAND CABINET, LAMINATE, 68 X 48 X 35"
1 - ISLAND CABINET, LAMINATE, 120 X 30 X 35"
- 40 LINEAR FT. LAMINATE WITH 3-DRAWER PEDESTAL BASE, 2-DOOR BASE
- 38 LINEAR FT. LAMINATE WITH 3-DRAWER PEDESTAL BASE
20 - LOCKERS, METAL, 2-TIER, 15 X 18 X 60"
28 - LOCKERS, METAL, 2-TIER, 12 X 12 X 60"
1 - OTIS PASSENGER ELEVATOR, 2-STOP
1 - LAB FUME HOOD, 47" WITH LAMINATE BASE CABINET
3 - PENINSULA LAB BASE CABINETS, LAMINATE WITH SINK, GAS, AIR, ACID PROOF TOP, 72 X 42"
- 12 LINEAR FT. LAB BASE CABINETS, LAMINATE, ACID PROOF TOP
- TOILET PARTITIONS
- MINI BLIND WINDOW TREATMENTS
- SIGNAGE
1 - DISPLAY CASE / DIRECTORY
12 - WELDING BOOTHS MASONARY

PLUMBING - A MODERN SYSTEM OF SANITARY FIXTURES CONSISTING OF:
22 - WATER CLOSETS
25 - LAVATORIES
8 - URINALS
2 - SANITARY SINKS
6 - ELECTRIC WATER COOLERS
1 - WASH FOUNTAIN
1 - SHOWER
1 - RAYPACK GAS FIRED DOMESTIC WATER BOILER WITH 115 GALLON STORAGE TANK

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES
1 - 1500 KVA TRANSFORMER ON PAD

HEATING AND AIR CONDITIONING -
1 - RAYPACK MODEL H-ADB-500 GAS FIRED BOILER
2 - RAYPACK MODEL H-ADB-750 GAS FIRED BOILERS
2 - RAYPACK MODEL H-6-962 GAS FIRED BOILERS
2 - RAYPACK MODEL H-4-1000 GAS FIRED BOILERS
1 - ITT BELL & GOSSETT HEAT EXCHANGER
2 - YORK MODEL H2CA300A46D CONDENSING UNITS, 25 TON CAPACITY
7 - YORK AIR HANDLING UNITS
1 - BALTIMORE AIR COIL MODEL F1443-0 FLUID COOLER

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

M-TEC: continued

HEATING AND AIR CONDITIONING - continued
1 - BALTIMORE AIR COIL MODEL F1463-P FLUID COOLER
- PUMPS AS REQUIRED
- BASEBOARD RADIATION
- RADIANT FLOOR IN STUDENT ACTIVITIES ROOM
1 - LIEBERT AIR CONDITIONING UNIT
1 - LIEBERT CONDENSING UNIT
1 - TRANE 2TRW4024A100011 CONDENSING UNIT, #6135KWL4F
- SOLAR THERMAL SYSTEM INCLUDING:
7 - MAZDON 30-TUBE SOLAR PANELS, 6 X 6' ON WALL MOUNTED STEEL FRAME
2 - STORAGE TANKS, 150 GALLON CAPACITY
- PUMPS
1 - MITSUBISIH SPLIT SYSTEM AIR CONDITIONER, 3 TON, ROOM 204

EXTERIOR WALLS - SPLIT FACE MASONRY WITH BLOCK BACK UP, 12"
- BLOCK, 8"
- HORIZONTAL METAL SIDING
- INSULATED GLASS IN ALUMINUM FRAME
3 - OVERHEAD DOORS, ROLL UP WITH ELECTRIC OPERATOR, 16 X 15', 28 X 22', 13 X 10'

MISCELLANEOUS - FIRE PROTECTION SPRINKLERS
- DATA/TELEPHONE/IT INFRASTRUCTURE
- DIGITAL FLOORING SYSTEM
2 - CANOPIES, STEEL FRAME, SPLIT FACE MASONRY, STEEL JOISTS, METAL DECK, STANDING SEAM METAL ROOF COVER, 13.5' X 14.5' X 10' HEIGHT
1 - SOLAR PV SYSTEM INCLUDING: 12 - BP SOLAR PANELS, 5 X 10'
- STEEL FRAME FOR PANELS, 42' WIDE 10' HEIGHT
2 - FRONIUS IG INVERTER
- WIRING
- SIMPLEX FIRE ALARM SYSTEM
1 - USA TANK MODEL 2520, WATER TANK STEEL, 25' DIAMETER X 20' HEIGHT, 66800 GALLON CAPACITY, #150115100A WITH CRANE STAIRCASE, SAND FILTERS
- FM200 FIRE SUPPRESSION SYSTEM FOR ROOMS 100 AND 204A
- ACCESS CONTROL SYSTEM
5 - CAMERA SECURITY SYSTEM

QUALITY OF CONSTRUCTION: GOOD

BUILT: 2000

R. A. SCHETTLER, INC.
Appraisal Engineers

Asset Acct.: NORTHWESTERN MICHIGAN COLLEGE Bldg.: NORTH HALL
REAL ESTATE - BUILDING

Description	11/1/23
FOUNDATION:	247,500.00
SUPERSTRUCTURE:	
FRAME	220,900.00
FLOORS	666,400.00
FLOOR COVERINGS	291,400.00
CEILINGS	182,800.00
ROOF STRUCTURE	217,700.00
ROOF COVER	229,300.00
INTERIOR CONSTRUCTION	2,055,900.00
BUILT-IN FIXTURES	1,183,000.00
ELECTRICAL	704,400.00
PLUMBING	871,000.00
HEATING AND AIR CONDITIONING	1,082,800.00
MISCELLANEOUS	103,000.00
EXTERIOR WALLS	824,800.00
FIRE PROTECTION	133,900.00
ELEVATORS	211,800.00
TOTAL LABOR AND MATERIALS	9,226,600.00
ARCHITECT'S PLANS AND SUPERVISION	6%

Replacement Value New	9,780,200.00
Depreciation %	5%
Sound Valuation	9,291,200.00

R. A. SCHETTLER, INC.
Appraisal Engineers

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

NAME OF BUILDING: NORTH HALL

KIND OF BUILDING: CLASS D

NO. OF STORIES: THREE

OCCUPANCY: STUDENT HOUSING

TOTAL SQUARE FEET = 46,730

FOUNDATION: CONCRETE

SUPERSTRUCTURE:

FRAME - STEEL

FLOORS - 4" CONCRETE SLAB, VAPOR BARRIER, INSULATION
- WOOD TRUSSES, WOOD DECK
- CONCRETE METAL PAN STAIRWAY

FLOOR COVERINGS - WOOD COMPOSITE, CERAMIS TILE, RUBBER BASE, CARPET, RESILIENT SHEET FLOORING

ROOF STRUCTURE - WOOD TRUSSES, WOOD DECK
- STEEL JOIST, METAL DECK

ROOF COVER - SINGLE PLY MEMBRANE OVER RIDGID INSULATION

CEILINGS - SUSPENDED ACOUSTICAL PANEL
- GYPSUM BOARD WITH KNOCKDOWN FINISH, PAINTED
- SUSPENDED WOOD SLAT PLANK CEILING SYSTEM

INTERIOR CONSTRUCTION - WOOD PARTITIONS, FEW MASONRY PARTITIONS

BUILT-IN FIXTURES - LAMIMATE KITCHEN CABINETS
- WOOD VANITY CABINETS
- LAMINATE LAUNDRY CABINETS

PLUMBING - AN MODERN SYSTEM OF SANITARY FIXTURES CONSISTING OF:
47 - WATER CLOSETS
49 - LAVATORIES
1 - URINAL
3 - SANITARY SINK
3 - LOCHINVAR MODEL SIT1199, INDIRECT WATER HEATER, 119 GALLON CAPACITY
2 - ELECTRIC WATER COOLERS
48 - SHOWERS

REAL ESTATE - BUILDING NORTHWESTERN MICHIGAN COLLEGE

NORTH HALL: continued

ELECTRICAL - AN APPROVED SYSTEM OF WIRING ALL IN CONDUIT WITH NECESSARY WALL PLUGS AND SWITCH BOXES

HEATING AND AIR CONDITIONING -
1 - LOCHINVAR MODEL FTX850, GAS FIRED TUBE BOILER, #239797
40 - CLIMATE MASTER HEAT PUMPS
6 - RENEWAIRE MODEL HEIXRT, ROOF TOP ENERGY RECOVERY UNITS
1 - LOCHINVAR MODEL FTX850, GAS FIRED TUBE BOILER, #216336
1 - LOCHINVAR MODEL FTX850, GAS FIRED TUBE BOILER, #216523
1 - GUNTNER MODEL GFH080, ROOFTOP DRY COOLER

MISCELLANEOUS - ACCESS CONTROL SYSTEM
6 - CAMERA SECURITY SYSTEM

EXTERIOR WALLS - HORIZONTAL CEMETITIOUS SIDING PANELS
- CEMENTITIOUS LAP SIDING
- ALUMINUM CURTAIN WALL
- ALUMINUM STOREFRONT
- BUILT-UP EYEBROW TRIM

ELEVATOR - KONE 3 STOP PASSENGER ELEVATOR, 4000 LB. CAPACITY, #9960649

YEAR BUILT - 2017

QUALITY OF CONSTRUCTION - GOOD

R.A. Schettler, Inc.
Certified
Appraisal Service
24634 W. FIVE MILE RD.
SUITE/UNIT 30
REDFORD, MI. 48239
(248) 705-5801
Industrial - Commercial
RAS
Residential - Institutional

NOVEMBER 1, 2023

ASSOCIATED GROUP UNDERWRITERS, INC.
39111 W. SIX MILE ROAD
LIVONIA, MICHIGAN 48152

TO WHOM IT MAY CONCERN,

AS REQUESTED BY THE MICHIGAN COMMUNITY COLLEGE RISK MANAGEMENT AUTHORITY, WE SUBMIT HEREWITH OUR CERTIFIED APPRAISAL OF LIBRARY HOLDINGS BELONGING TO NORTHWESTERN MICHIGAN COLLEGE, 1701 E, FRONT STREET, TRAVERSE CITY, MICHIGAN. THIS APPRAISAL INCLUDES MEDIA CENTER COLLECTIONS ONLY.

THIS APPRAISAL IS REPORTED IN A NUMBER OF CATEGORIES AND FURNISHES AN UNBIASED STATEMENT OF VALUES. VALUES STATED ARE REPLACEMENT VALUE NEW, WHICH ARE DEFINED AS THE COST THAT WOULD BE INCURRED IN ACQUIRING AN EQUALLY DESIRABLE SUBSTITUTE FOR PROPERTY, WHICH IS DETERMINED IN ACCORDANCE WITH MARKET PRICES PREVAILING AT THE DATE OF THIS APPRAISAL AND REPRESENTS THE COST TO REPLACE NEW, THE PROPERTY IN LIKE KIND.

IN THIS ANALYSIS, WE HAVE RELIED ON THE BOWKERS ANNUAL GUIDE TO PROVIDE AVERAGE UNIT PRICES FOR COMMUNITY COLLEGE LIBRARY COLLECTIONS. WE HAVE MET WITH YOUR MEDIA DIRECTOR OR OTHER STAFF TO DISCUSS THESE VALUES AND TO MAKE ADJUSTMENTS FOR ANY SPECIAL CIRCUMSTANCES OR COLLECTIONS.

WE HAVE NOT EXAMINED THE LEGAL TITLES OF PROPERTY, THEREFORE WE DO NOT ASSUME RESPONSIBILITY REGARDING THE OWNERSHIP OF PROPERTY IN THIS APPRAISAL.

VERY TRULY YOURS,

R.A. SCHETTLER, INC.

R.A. Schettler, Inc.
Certified
Appraisal Service
24634 W. FIVE MILE RD.
SUITE/UNIT 30
REDFORD, MI. 48239
(248) 705-5801
Industrial - Commercial
RAS
Residential - Institutional

NOVEMBER 1, 2023

NORTHWESTERN MICHIGAN COLLEGE
1701 E. FRONT STREET
TRAVERSE CITY, MICHIGAN 49684

TO WHOM IT MAY CONCERN,

AS REQUESTED BY THE MICHIGAN COMMUNITY COLLEGE RISK MANAGEMENT AUTHORITY, WE SUBMIT HEREWITH OUR CERTIFIED APPRAISAL OF LIBRARY HOLDINGS BELONGING TO NORTHWESTERN MICHIGAN COLLEGE, 1701 E, FRONT STREET, TRAVERSE CITY, MICHIGAN. THIS APPRAISAL INCLUDES MEDIA CENTER COLLECTIONS ONLY.

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VERY TRULY YOURS,

R.A. SCHETTLER, INC.

R. A. Schettler, Inc.
Appraisal Engineers

Northwestern Michigan College

DATE: NOVEMBER 2023

Library Holdings by Building

Building Name	Circulating Books	Reference Books	Periodicals	Videotape	CD Rom	Sound Recordings	Other Holdings	Building Total
Innovation Center	1,602,600	190,320	69,200	28,690	0	0	4,751	$1,895,561
TOTAL	$1,602,600	$190,320	$69,200	$28,690	$0	$0	$4,751	$1,895,561

Appendix I

Campus Maps

NMC Main Campus

1701 E Front Street
Traverse City, MI

Northwestern Michigan College

1 Dennos Museum (DMC)
2 Scholars Hall (SH)
- Writing & Reading Center
3 Osterlin Building (O)
- Academic & Career Advising Ctr.
- Disability Services
- Intl. Services & Svc. Learning
- Student Life
  - Personal Counseling
- Student Success Center
- Tutoring Center
- Placement & Testing Center
- Veterans Lounge
4 Power House
5 Tanis Building (T)
- Enrollment Services
  - Admissions
  - Financial Aid
  - Records & Registration
- Math & Science Center
6 Les Biederman Building (LB)
- Health Services
7 Health & Science Building (HS)
- NMC Bookstore
  - Apartment Management
8 Founders Hall (FH)
9 Timothy J. Nelson Innovation Center & Library (IC)
- Campus Safety
  - Student IDs, Parking passes
- Hawk Owl Café
- Technology Help Desk
10 East Hall (EH)
11 Clock Tower
12 Fine Arts Building (F)
13 James Beckett Building (JB)
14 Campus Apartments
15 Oleson Center (OC)
- Child Care Center
16 Phys Ed Building (P)
17 Maintenance Building/ Shipping & Receiving
18 North Hall (NH)

Map Legend
- Campus Entrances
- Parking Lot
- Accessible Parking
- Accessible Entrance
- Bus Stop

N W E S

Eastern Avenue
North College Drive
Elm Lot
Cherry Lot
Dogwood Lot
Juniper Lot
Chestnut Lot
Maple Lot
Cedar Lot
Birch Lot
Aspen Lot
Pine Lot
Tamarack Lot
Poplar Lot
College Drive
E Front St
Munson Avenue
Fair Street
Indian Woods W
Indian Woods E
Apache
Huron
Wenonah
31
72

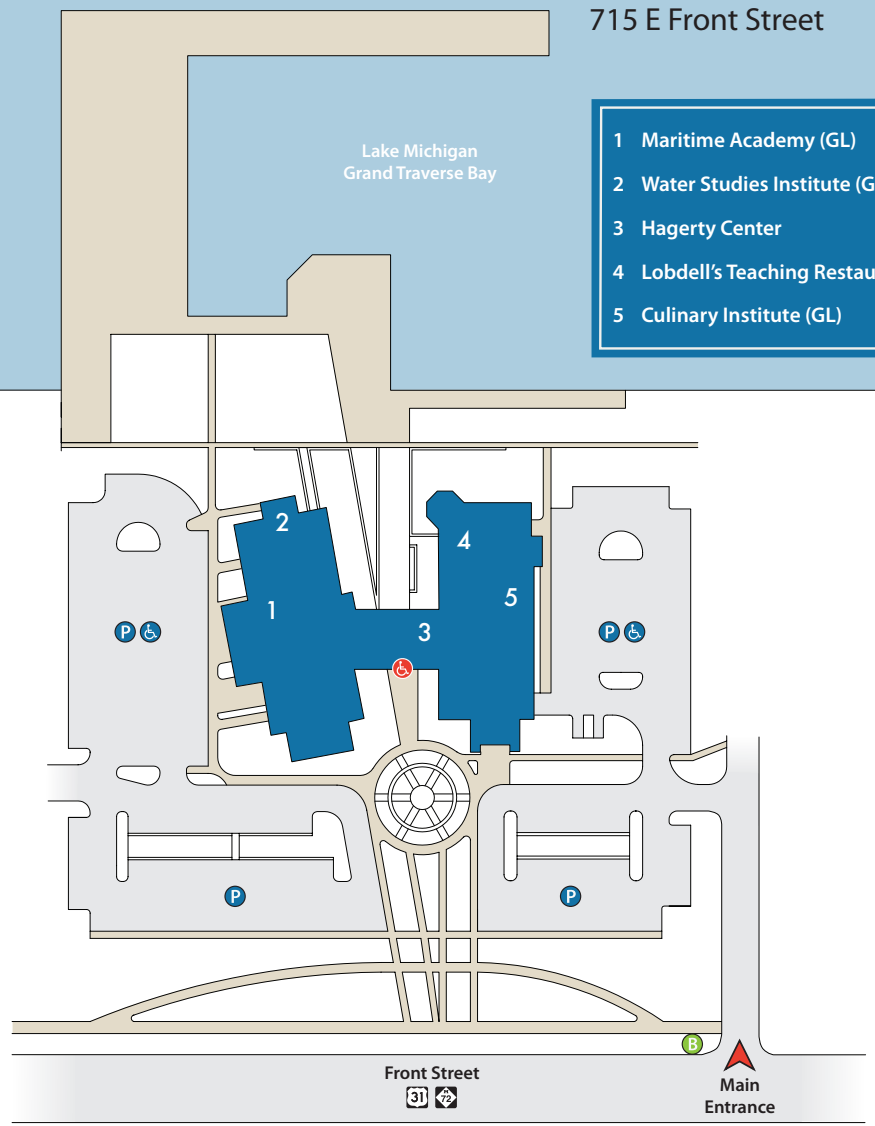
Map Legend

- Campus Entrances
- Parking Lot
- Accessible Parking
- Accessible Entrance
- Bus Stop

Northwestern Michigan College

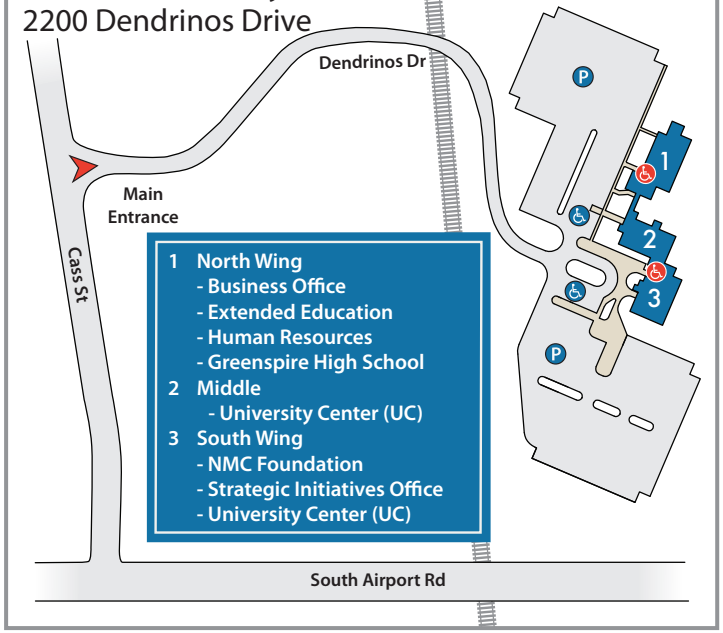
N
W E
S

Great Lakes Campus
715 E Front Street



1 Maritime Academy (GL)
2 Water Studies Institute (GL)
3 Hagerty Center
4 Lobdell's Teaching Restaurant
5 Culinary Institute (GL)

NMC University Center
2200 Dendrinos Drive



1 North Wing
- Business Office
- Extended Education
- Human Resources
- Greenspire High School

2 Middle
- University Center (UC)

3 South Wing
- NMC Foundation
- Strategic Initiatives Office
- University Center (UC)

Aero Park Campus
2600 Aero Park Drive