



## IMPACT100 TRAVERSE CITY

### 2024 EDUCATION: NORTHWESTERN COMMUNITY COLLEGE FOUNDATION

<https://www.nmc.edu/about/foundation/index.html>

### INITIATIVE: BRINGING 3D PRINTING HOMES TO NMC AND OUR COMMUNITY

#### OVERVIEW OF INITIATIVE – IN THE APPLICANT’S WORDS

Northwestern Michigan College (NMC) is seeking funding to purchase a 3D printing arm. This 3D printer will revolutionize the construction industry in our region by leveraging cutting-edge technologies to construct homes more efficiently, with smaller teams, and at an accelerated pace.

NMC’s ultimate goal is to tackle the current labor shortages and affordable housing crisis and create a brighter future where technology is fully harnessed. NMC is committed to helping students acquire specialized technical skills that will set them apart in the job market, with innovative problem-solving techniques, as well as leadership and entrepreneurship skills to equip them for success.

NMC will implement a revised curriculum focused on innovation with emerging technology utilizing the first 3D home wall printer in Northern Michigan. At NMC, they aim to meet this need by introducing students to the latest advancements in construction technology and pushing the boundaries of innovation.

*The following sections contain certain key information from the application, as written by the applicant. While detailed financial information has not been provided here due to its confidential nature, each applicant submitted an initiative budget and supporting financial documents as part of their application. Each proposed initiative and the supporting financial documentation has undergone a thorough financial review by our Financial Review Committee and the initiatives proposed by our finalists have met our standards for moving forward.*

#### ORGANIZATION’S VISION STATEMENT

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

## **ORGANIZATION'S MISSION STATEMENT**

We deliver lifelong learning opportunities to transform lives and enrich our communities.

## **DESCRIPTION OF ORGANIZATION AND ITS HISTORY**

The spirit of giving runs deep at Northwestern Michigan College. Founded In 1951, the people of northwest Michigan established NMC because they wanted the benefits of higher education for their families and for themselves. They committed their time and generously gave to make the dream a reality.

Northwestern Michigan College was the first comprehensive community college chartered in the State of Michigan. Since its founding in 1951, 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 has become a source of “education” in the largest sense, a source of meaningful new knowledge, skills and experiences. This is our mission, after all, to “provide lifelong learning opportunities to our communities.” 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.

To meet our mission, we are fully engaged in each of the following purposes, with the result that our learners meet their goal(s) 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

Also, in order to accomplish NMC's stated Mission, Vision, and Purposes, organizational activities focus on achieving the following strategic goals and demonstrating competence in Institutional Effectiveness Criteria:

- 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.

The NMC Foundation was founded in 1981 as a 501(c)(3) non-profit, and, thanks to you, we continue the work of our founders by supporting the college through fundraising and community advocacy.

## **EXECUTIVE SUMMARY OF INITIATIVE**

There is a housing crisis in Northern Michigan, and 3D printing technology can help. According to the 2023 Traverse City Community Overview and Housing Marketing Summary, of the currently available for-sale homes in Traverse City, a vast majority (70.6%) are priced at \$400,000 or higher. Those priced between \$300,000 and \$399,999 (20.6%) and those between \$200,000 and \$299,999 (5.9%) comprise the next largest shares of available homes by price point. With 91.2% of the currently available product priced at \$300,000 or higher, this represents a distribution of product that is notably concentrated among the higher price points. Most low-income households and first-time homebuyers would likely have difficulty purchasing an affordable home in the market currently with only one home (2.9% of the supply) priced at \$200,000 or less.

According to the US Department of Housing and Urban Development, there were about 580,000 homeless people in the US in 2020, and this number is on the rise due to the COVID-19 pandemic and its economic impacts. 3D-printed homes will provide them with a safe and permanent shelter that can improve their health and well-being.

The National Low Income Housing Coalition stated that the world has grown to a need for more than 7 million homes to address the affordable housing crisis. Concrete 3D printing is being proposed as a solution to this problem.

One of the applications of 3D concrete printing is to create affordable and customizable homes for different segments of the population. According to a report by Markets and Markets, the global market for 3D printing in construction was valued at \$0.3 billion in 2020 and is projected to reach \$1.9 billion by 2026, growing at a compound annual growth rate (CAGR) of 34.5%. Some of the factors driving this growth include the increasing demand for low-cost and sustainable housing, the rising adoption of automation and digitalization in the construction industry, and the environmental benefits of reducing waste and emissions.

The NMC's Construction Technology program was established in 2004, and it has graduated over 1,000 students. However, limited access to modern technology has presented challenges for students. Our goal is to equip students of all ages with advanced technologies to help them overcome industry challenges and be prepared for the building techniques of the future—while helping to solve the housing crisis. For example, a 3D printed home can be completed in an outstanding 90 days versus six to nine months for a traditional build. These homes will be stronger, faster, and safer.

Our proposal, seeking funding support to purchase a transformational 3D printing arm for education, is designed to revolutionize the construction industry in our region. We can do so by leveraging cutting-edge technologies to construct homes more efficiently, with smaller teams than the norm, and at an accelerated pace. Our ultimate goal is to not only tackle the current labor shortages and housing crisis but also create a brighter future where technology is fully harnessed. We are committed to helping students acquire specialized technical skills that will set them apart in the job market, leading to enhanced job prospects and higher salaries. Our students will acquire innovative problem-solving techniques, as well as leadership and entrepreneurship skills, to equip them for success. Our objective is to empower them with the knowledge they need to thrive.

We will disrupt a complacent/stagnant marketplace by implementing a revised curriculum focused on innovation with emerging tech (starting with 3D technology). In today's world, technology has become an indispensable tool in nearly every profession and facet of our daily lives. Now, there is a growing recognition of the urgent need for technology across all trades involved in construction, driven by the scarcity of skilled and available labor. At Northwestern Michigan College (NMC), we aim to meet this need by introducing students to the latest advancements in construction technology. We are committed to pushing the boundaries of innovation.

What sets us apart is our ability to foster an innovation ecosystem, collaborate with industry partners, and adopt a fresh approach to curriculum development. Our collective efforts focus on creating groundbreaking solutions and empowering our students to succeed.

## **COMMUNITY TO BE SERVED**

The community to be served will extend beyond NMC's five county reach of Antrim, Benzie, Grand Traverse, Kalkaska and Leelanau counties. Not only will NMC train workforce ready students, who will help fill the urgent need for skilled and available labor in the construction trades, but this impact will reach a housing crisis in northern Michigan. Supplementing our construction workforce will allow us to collaborate with industry partners and revolutionize the construction industry to construct homes more efficiently, and at an accelerated pace. We are committed to helping students acquire specialized technical skills that will set them apart in the job market, leading to enhanced job prospects and higher salaries. Our students will acquire innovative problem-solving techniques, as well as leadership and entrepreneurship skills, to equip them for success and our community will benefit from more affordable housing solutions.

## **NEEDS OF THE COMMUNITY TO BE SERVED AND GAPS IN EXISTING SERVICES**

Affordable and sustainable housing and employment opportunities continue to be at the forefront of community concerns in the greater five county region that NMC serves. NMC is on the ground breaking forefront of bringing 3D printing education, affordable and sustainable housing, and jobs to northern Michigan.

The anticipation and excitement of NMC "paving the way" for 3D printing, has inspired other organizations to partner with Traverse Connect and explore bringing a 7,000 square foot hub to Traverse City, Michigan which has the potential to create 80-150 new jobs. In short, 3D printing is the future of affordable homes, and promises to only continue to grow.

Acquiring a 3D Printer is also a direct response to the 2023 Traverse City Community Overview and Housing Marketing Summary recommendations which recommend local officials, stakeholders and housing advocates consider the following to address local housing issues:

- Support efforts to encourage residential development of both rental and for-sale housing products.
- Emphasize and support projects that consider a variety of affordability levels and target segments (e.g., seniors, individuals, young families, professionals, etc.).
- Identify and reach out to advocates, foundations, developers and investors that could be potential residential development partners.
- Reach out to and work with housing organizations and professionals that can bring expertise and increase the community's capacity to address housing issues.

## **SUSTAINABILITY OF THE PROPOSED INITIATIVE**

NMC leadership understands the commitment required of the college should the Impact 100 grant be awarded. Their approval to apply for this initiative was received prior to application which confirms their commitment to sustaining this initiative. After the initial investment into the specific 3D printing equipment, NMC will move forward with implementation of the curriculum. NMC will continue to support the technology and curriculum development by providing staff time and financial support. A "stage 2" of sustainability will be working with

NMC's business office to create revenue driving agreements with community partners to use the technology on our campus and/or have students print home panels on site at a cost to outside vendors. Additionally, revenue for the educational classes and certifications from students and community members will continue to drive enrollment and program sustainability.