Implementation Plan

The 5-year comprehensive master plan should identify the schedule by which the institution proposes to address major capital deficiencies, and:

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

Lake Michigan College will be submitting a $7,920,100 million capital outlay request to help advance the **College agenda to create a 21st century learning environment and support network, enhance student success, and improve energy efficiency.** The proposal will impact students and faculty at the College's Napier Avenue Campus.

This investment will supplement the $7.3 million investment the College has already made in the renovation of its science labs in the last three years to support its STEM initiative. It is also expected that during the next five years the College will invest an additional $14.4 million in critical infrastructure that is more than 40 years old and no longer supports current teaching, learning and student engagement.

Included within the College Capital Outlay request are the following:

21st Century Teaching and Learning and Advancing Student Success

- Improve the classroom environment and incorporate new teaching technologies into College classrooms to enhance student success and better prepare them for the use of "real-world" technologies at work or in advanced studies.
- Create a new service center to assist faculty with:
  - Redesign and revitalization of curricula, and
  - Identifying and learning new technologies and incorporating those technologies into the classroom.
- Create new student engagement spaces on the Napier Avenue Campus to provide group study and classroom project preparation areas supporting interdisciplinary collaborative learning throughout the College.

Energy Savings

- Replace our original heating and cooling plant and air handling units. This equipment is over 40 years old and well past its design lifetime. Annual energy savings is estimated at $277,400.
- Connect the STEM initiative and the physical plant replacements by bringing the energy data into the classroom, thereby using the building itself as part of the instruction.

The proposed grant is grounded in two fundamental needs:

- **21st Century Teaching and Learning and Advancing Student Success**
- **Energy Savings**

21st Century Teaching and Learning and Advancing Student Success

The College proposes renovating 50 classrooms in its 40+ year classroom facility along with several areas for student engagement and learning.

Learning occurs everywhere, in many forms, and is interdisciplinary. Compared to what learning meant, it is now increasingly rigorous in keeping with the demands of "21st century literacies." Most importantly, it is increasingly occurring in "technology-rich environments." As a means to acquire new skills, opportunities for social interaction are a must-have norm. Learning is increasingly flexible, forward-thinking, and challenges existing approaches to student engagement.

In 2011, Lake Michigan College completed a 3-year, $7.3M renovation of our science laboratories in support of our Science, Technology, Engineering and Math (STEM) initiative. Included in our five year capital plan is a $4.1M replacement of our primary HVAC plant which we expect to result in more than $277,400 in energy savings annually. In conjunction with the College's efforts we seek funding support to close the loop on our initiative to use our physical plant as a learning laboratory and improve student outcomes by providing teaching spaces that support the incorporation of the current technologies and teaching methods into the College.

Learning Today: Gone are the days when students would accept muted, inflexible settings where individual work was the core approach to the acquisition of knowledge. Today's students thrive on interdisciplinary, collaborative and engaging approaches to learning; a distinct movement away from lecture-based mediums. The most successful students learn from multiple interactions with their physical environment and social exchanges. With recent activities at the College focused on the advancement of STEM learning opportunities, evidence suggests remarkable advances in student engagement through campus redesign efforts. Today's students demonstrate a strong preference for renovated spaces, and expect to see innovative learning tools at the College. Roughly 70% of Fall 2010 students who utilized resource center advancements "were retained in Winter 2011, compared to only 35% of students who did not use the resource center. Student learning is greatly enhanced by the provision of multiple, flexible tools for skill acquisition, like those provided through the College's STEM-focused efforts. Within a new science resource center students had a 13% higher chance of being successful in a science course after utilizing the redesigned resource center versus those who did not use the resource center (Hanover Research, Fairbanks Science Student Resource Room, Lake Michigan College). Clearly, <u>renovated spaces coupled with student engagement are essential for learning advancements</u>.

Classroom Technology: Use of advanced technologies in College environments is a requirement for today's learning landscape. When employed with a focus on up-and-coming technology trends, student satisfaction and engagement with learning tools increases, as was the case "with use of SmartBoards jumping by more than two thirds" at Ryerson University

of Toronto. Students no longer learn well through the use of "old-school" chalkboards, but instead, thrive when multiple forms of media are incorporated into the learning environment.

Classroom Design: Students' satisfaction levels with learning activities are increased, and learning itself is positively impacted by sustainable implementations of acoustics, sightlines, access to power outlets and internet, white boards, air quality, ventilation and temperature instrumentation accessibility, moveability, and comfort of furniture partnered with tech-based features. Advanced learning and use of space for small group work increased by 80% in one semester at Ryerson University in Toronto. The way students learn today is largely influenced by multidisciplinary and collaborative technology approaches, needs assessments, networking, research and evaluation efforts, resulting in more fully engaged teachers and learners.

Students' perceptions of their current learning environment have been found to "be a stronger predictor of learning outcomes . . . than prior achievement at school!"

Flexible Learning Spaces: "Studies released by Cornell University showed direct connections between educational architecture and high performing students (Cunningham, 2002)." For generations wanting flexible, digital learning versus being "lectured-at," smaller, team-based interactive rooms (University of Alberta), with few furniture barriers and teaching pods with views are increasingly popular as a means to enhance skills acquisition.

"Learning is optimized when physical environments are treated in the same focused way that curricular material and teacher presentations are created (Graetz, Goliber, 2002)."

Physical Space, the Physical Plant and Learning: Clearly, student learning is greatly influenced by the physical environment. The College took intentional and distinct actionable steps in designing the 11 new science classrooms/labs to incorporate the physical plant as a learning tool; but further implementation is needed in the remaining 50 classrooms to provide an internal environment that parallels that understanding. Integrated redesign would allow for much-needed new technologies across the remaining College classrooms.

Energy Savings

The Lake Michigan College (LMC) Academic Building is a three-story structure, with the largest floor being the first floor, which is partially underground. The underground portion of the structure connects the second and third floor wings. Open for fall classes in 1969, the building serves as the primary instructional facility for the College, with 303,147 square feet.

- ***Lake Michigan College proposes to replace our aging mechanical infrastructure and support systems with new sustainable, energy efficient mechanical and support systems, including heating, cooling, air distribution, building control systems, supporting electrical and ceiling systems, fire alarm system, and security systems.***

The HVAC and Support Systems currently being utilized at Lake Michigan College are now beyond their recommended service life with antiquated controls and obsolete technologies. While the College was originally constructed with sustainable energy features such as a

green roof and a cooling system utilizing the College's lake, the majority of the equipment was installed with the original building construction, thus most of the equipment is in excess of forty years old. In the past forty years, technology has changed and advanced in Mechanical and Support Systems. The proposed renovation will build on the College's legacy of providing an educational environment with the latest in sustainable, energy efficient technologies. We expect implementing this renovation will save the College approximately **$277,400 in energy costs on an annual basis**.

Conclusion

This grant intentionally helps the College complete the process of sustainable campus redesign by providing interdisciplinary learning not just in our science curriculum, but across the College. Most importantly, it adds necessary value to the College's investment of general funds in replacing the heating and cooling plant, in-turn enabling data used in that project to be incorporated into the classroom. Energy simulation modeling through campus redesign will allow for buildings to serve as teaching tools, technology, operations and maintenance tools, educational and policy outcomes learning tools.

This grant will allow the College to link the investment of general funds on the plant upgrades, in a full-circle systems approach, to interdisciplinary, co-curricular student outcomes environments. The campus infrastructure, through this grant, will be allowed to enhance the campus architecture, classroom surroundings, teaching methods and highly-focused available technologies for unique, advanced skills.

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.*

Lake Michigan College has identified a five-year backlog of $54,936,291 deferred maintenance and capital projects. Of this backlog we have identified $13,128,166 of currently critical deferred maintenance items that have safety, regulatory or collateral damage implications within one year. While our facilities are currently in good condition and have been well maintained, the mechanical and electrical infrastructure is beyond useful life and must be replaced. Not doing so will result in our facilities condition continuing to degrade to the extent that our ability to support an effective learning environment will be seriously compromised. Without funding, by 2017 the value of identified deferred maintenance items with safety, regulatory and collateral damage implications will grow to $97,491,660. Clearly we continue to operate at a critical juncture in the life of our physical plant.

Projects that have associated annualized cost savings include the following projects.

Project	Estimated Cost	Annual Savings
HVAC System Upgrade at Napier Academic Building	$4,128,645.	$277,400.
Miscellaneous Electrical Upgrades	171,562.	9,785.
M-TEC Electrical Upgrade	12,287.	5,157.

In addition, other projects, notably the plaza upgrade, brick tuck-pointing and replacing an exterior stairway, while not resulting in an annual cost savings, do represent an eventual cost savings in reduced collateral damage to adjacent building infrastructure.

Finally, projects are in some cases designed to mitigate risk to our students and staff by providing a safe educational environment. Projects falling into this category include: adding a safety railing to the plaza, providing upgraded site lighting, and providing additional emergency phones in the student/staff parking lots.

C. *Include the status of on-going projects financed with State Building Authority resources and explain how completion coincides with the overall five-year plan.*

Facility	Project Status
South Haven Campus	Complete and operational

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 facility assessment includes several projects with energy savings including HVAC, electrical and boiler replacements. Preliminary estimates indicate that the College could save up to 50% of its maintenance and utility costs for the next 20 years by replacing the existing replacement of the HVAC system with an energy efficient, sustainable system such as geothermal. In addition, the facility assessment takes advantage of renovation as opposed to more costly new construction.

See the **Facility Assessment** tab for further details.

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

All existing Lake Michigan College facilities are currently provided with distance learning classrooms. In addition, Internet courses, including Internet registration, and Web-enhanced courses are also readily available to our student population.

F. Identify a maintenance schedule for major maintenance items in excess of $1,000,000 for fiscal year 2013 through fiscal year 2017.

Project Description	Estimated Cost	Implementation Year
Partial roofing replacement at Napier Academic Building and replaced campus access roads.	$1,615,034	FY'13
Replace original heating boilers and chiller with new energy efficient equipment (phase 1), complete roofing replacement at Napier Academic Building and complete phase 1 of a College Library renewal and renovation.	$3,698,498.	FY'14
Complete replacement of original heating boilers and chiller with new energy efficient equipment, complete the College library renewal and renovation.	$2,515,823.	FY'15
Replace Mendel Center north parking lot.	$1,160,000.	FY'16
Replace Mendel Center roof.	$1,073,913	FY'17

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

For the current fiscal year, Lake Michigan College has budgeted $4,192,145 for non-routine maintenance projects and renovations. The funding source is the College General Fund.

See **Facility Assessment** tab, for additional information on these, and other maintenance projects.