

3 Analysis Findings

Statewide Context

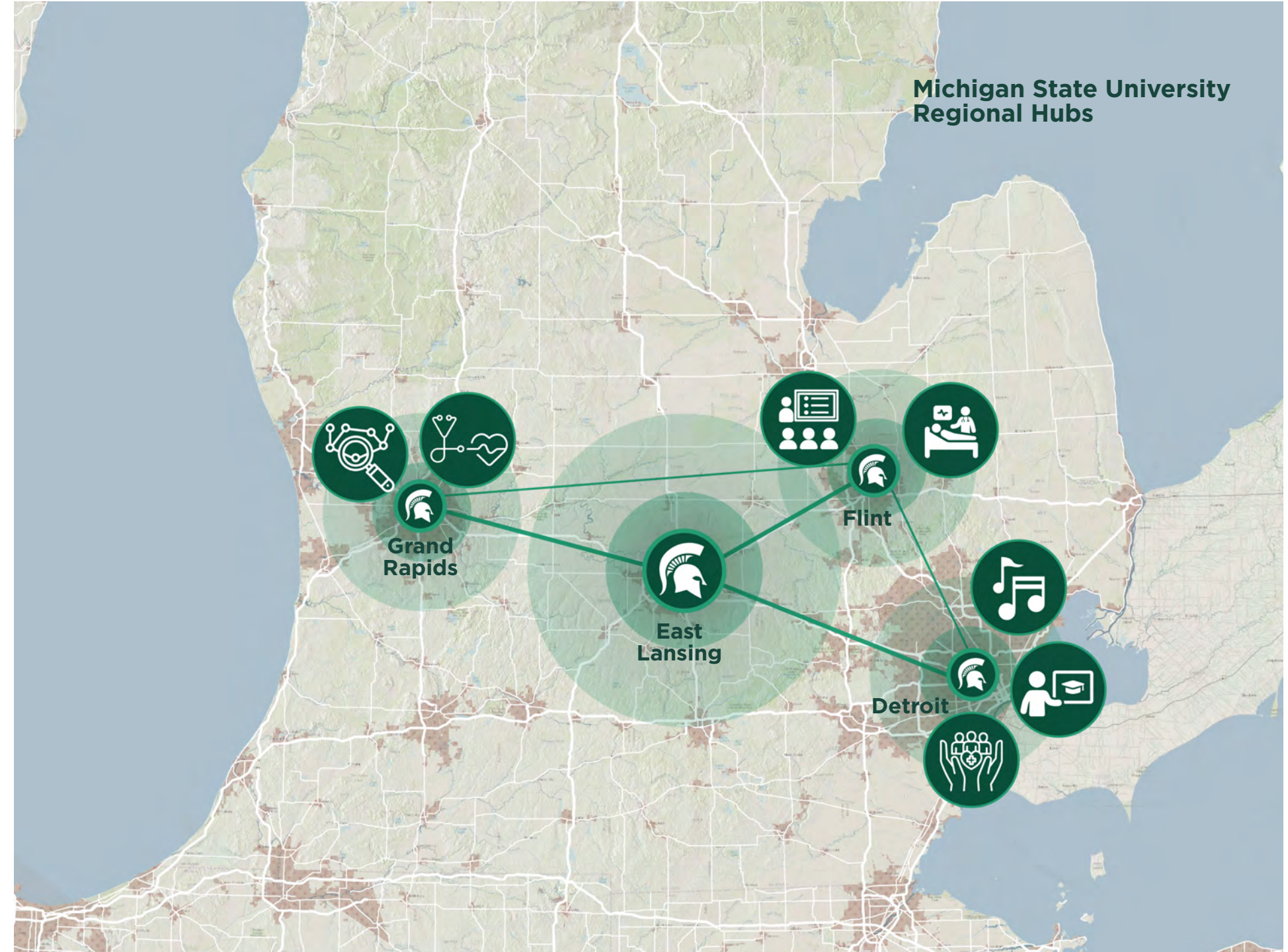
Since its founding in 1855 as the Agricultural College of the State of Michigan, Michigan State University has supported education, research, and outreach that links Michigan's economic strengths with the nation and globe. As the statewide economy has evolved and diversified, so too have the university's facility needs, expanding from an institution focused on agriculture and sciences to one that touches nearly every aspect of the state's economic and social fabric. Additionally it maintains and extension presence in all 83 counties and operates 30 AgBioResearch facilities throughout the state.

Most of these initiatives are supported within the facilities of the university's East Lansing campus, which benefits from its 5,200 contiguous acres. The East Lansing campus also operates as a hub for facilitating and coordinating teaching and learning, research, and outreach at various statewide facilities. In addition to the health sciences facilities in East Lansing, MSU's facilities in Grand Rapids and Flint support medical education and a wide array of clinical, translational,



The variety of university facilities - from outdoor research plots to more traditional facilities for learning and discovery - reflect the spectrum of activities MSU supports.

and basic science research. These activities are increasingly supported in metro Detroit through partnership with Henry Ford Health and the Detroit Pistons. The university's College of Agriculture and Natural Resources and College of Veterinary Medicine use several research facilities to perform field research that ensures the needs of future generations are met by sustainable and resilient means. Finally, MSU Extension improves the lives of individuals, communities, and businesses across the state by delivering the knowledge and resources developed at the university.



East Lansing Campus

Michigan State University's East Lansing campus occupies 5,200 acres of land roughly bound by Grand River Avenue and Michigan Avenue to the north, Harrison Road to the west, Sandhill Road to the south, and Hagadorn Road to the east. The campus sits less than five miles east of downtown Lansing, the state capital and a metropolitan area with over 500,000 residents.

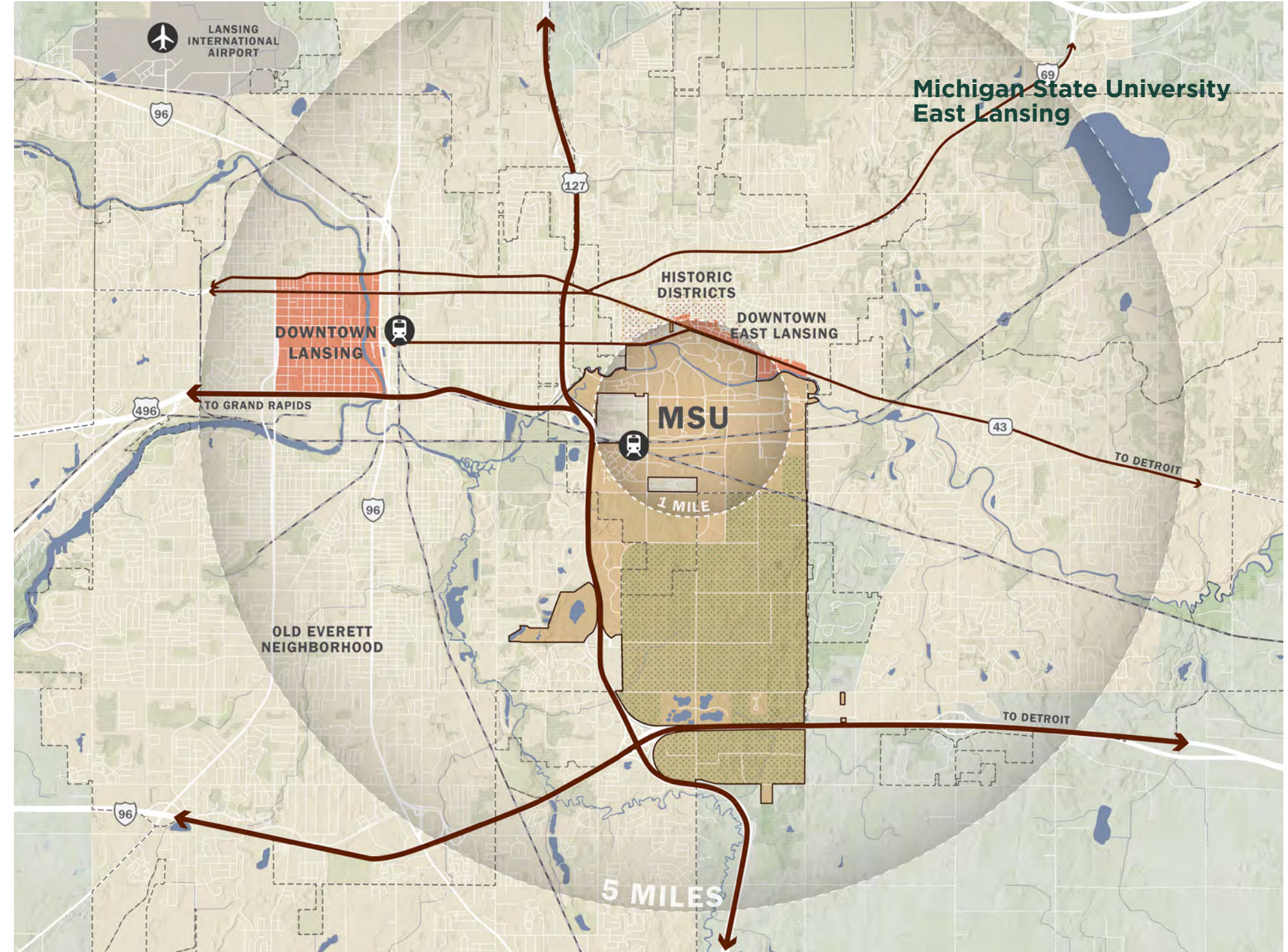
Unique among land grant institutions, the southernmost 60% of the campus form contiguous farmlands which provide a vital resource for learning and discovery. The most historic portions of campus occupy the northernmost portion of campus; the Central Campus, Southeast Campus, and former Spartan Village are more suburban in nature. The Red Cedar River bisects the northern half of campus and joins the Grand River just west of campus to flow into Lake Michigan. This separates the historic North Campus, built predominantly between 1857 and 1945, from Central Campus, much of which was built during the post-war period.

The landscape and mobility systems reflect these two eras of development, with North Campus having a more fine-grained, intimate, and pedestrian-oriented pattern and Central Campus being more suburban with mega-blocks, a less mature tree canopy, and larger building footprints.



The campus is strongly defined by the sensation of being in a park-like environment and the relationship with the Red Cedar River.

Research and learning in agriculture, natural sciences, and veterinary medicine is an integral part of the MSU history and spatial identity as seen not only in the Agricultural Campus south of Mt. Hope, but also in the natural areas, gardens, and greenhouses dispersed throughout the campus.



Regional Facilities

Grand Rapids

With one of the state's leading health care sectors, Grand Rapids supports Michigan State University's College of Human Medicine and affiliated research in health sciences. These facilities are predominantly located within the city's Medical Mile district focused along Michigan Avenue on the northern edge of downtown, allowing the university to leverage adjacent medical and health science facilities for clinical training and research.

Within the district, the university occupies approximately 550,000 sqft of space including the Secchia Center, which primarily houses academic facilities for first- and second-year students, and the Grand Rapids Research Center and Doug Meijer Medical Innovation Building, which primarily house research functions. The age of these facilities and the fact that many were designed with shell space provides the university with adequate flexibility to meet foreseeable research space needs.



Flint

In addition to its Grand Rapids campus, the College of Human Medicine (CHM) has operated a campus in Flint since 1971. The Flint campus is one of CHM's eight community campuses; approximately 100 students complete their third and fourth year medical school through disciplinary clerkships in Flint-area hospitals. These students are heavily involved in the Flint community.

In 2014, the college opened an approximately 40,000 sqft facility for medical education and research in the historic Flint Journal building. The facility provides learning environments for third- and fourth-year students and research space focused on clinical and public health. The campus has plans to develop additional square footage within the facility in the near term. In addition, MSU has a partnership with the Charles Stewart Mott Foundation for the relocation and expansion of the College of Human Medicine's Public Health program. Current plans will nearly double space for this important research.



Detroit

MSU maintains a robust presence throughout Detroit, with over 200 projects, initiatives, and activities at over 1,000 locations. For decades, MSU has been working with partners in Detroit to support economic development, advance the arts, transform schools, improve health, advance urban agriculture, and sustain the environment. Its collective partnerships and collaborations yield approximately \$317 million of economic impact for the region to improve the lives of Detroiters and Michiganders alike.

Historically, its largest presence occurred in the MSU Detroit Center on Woodward Avenue. The center provides a home base for numerous units including College of Education, Detroit Outreach Admissions Office, MSU Community Music School – Detroit, Governmental Relations – Southeast Michigan, University Outreach and Engagement, and the Study of Active Neighborhoods in Detroit. The Health Sciences have teaching and learning facilities at the Detroit Medical Center and Macomb University Center in Clinton Township. More recently, the university expanded its physical presence with programs that include the Apple Developer Academy, a unique partnership with Apple to offer training in the global app ecosystem located downtown on Woodward Avenue; the Partnership for Food, Learning and Innovation, the university’s first urban agriculture center; and in Detroit’s Corktown researchers are exploring ways to use composite materials to make automobiles lighter and more fuel-efficient. The Department of Energy tapped MSU to lead a large-scale manufacturing facility, the MSU Center of Excellence, part of the Institute for Advanced Composites Manufacturing Innovation and majority investor of the historic/iconic Fisher Building, just to name a few.



In 2021, the university signed a strategic partnership with the Henry Ford Health System forming the Henry Ford Health + MSU Partnership to create a world class research facility that will further fuse basic and translational research, serving as an epicenter for innovation and discovery, with a special focus on ending health disparities that plague our most vulnerable communities. The partnership will help reimagine how we think about, innovate, and deliver health and wellness with a goal to set a new standard for how individuals and communities experience care across the state of Michigan and the nation. The partnerships and facilities will also focus on academic medical and health education of the future. Beyond this initial research building, the university reserved another large parcel to accommodate additional growth over time.

Kellogg Biological Station

At approximately 3,873 acres, the Kellogg Biological Station (KBS) is Michigan State University’s largest off-campus educational complex and one of North America’s premier inland field stations. The center is located east of Gull Lake, approximately 65 miles from the East Lansing campus. Originally the summer home of the W.K. Kellogg family, the historic 32-acre estate was turned over to Michigan State University upon his death in 1951 and has since expanded to its current size. The station includes the W.K. Kellogg Bird Sanctuary, W.K. Kellogg Farm, KBS Academic and research facilities, W.K. Kellogg Conference Center and Manor House and Lux Arbor reserve. In addition, the nearby W.K. Kellogg Experimental Forest is closely affiliated with KBS.

KBS is a premier site for field experimental research in aquatic and terrestrial ecology that takes advantage of the diverse managed and unmanaged ecosystems. The varied habitats of KBS includes forests, old fields, streams, wetlands, lakes, and agricultural lands supporting a wealth of teaching and learning, research, and outreach functions. Much of the research focuses on the relationship between agriculture and ecology. World renowned for its contributions to ecological science and evolutionary biology, KBS is home to one of the National Science Foundation’s Long-Term Ecological Research programs, and is committed to science and ecology education, conservation of natural resources and sustainable agriculture research and demonstration. It is also home to the USDA supported Long-Term Agroecosystem Research network, making it one of 18 sites around the United States where agricultural scientists address long-term questions related to the intensification of agricultural activities.



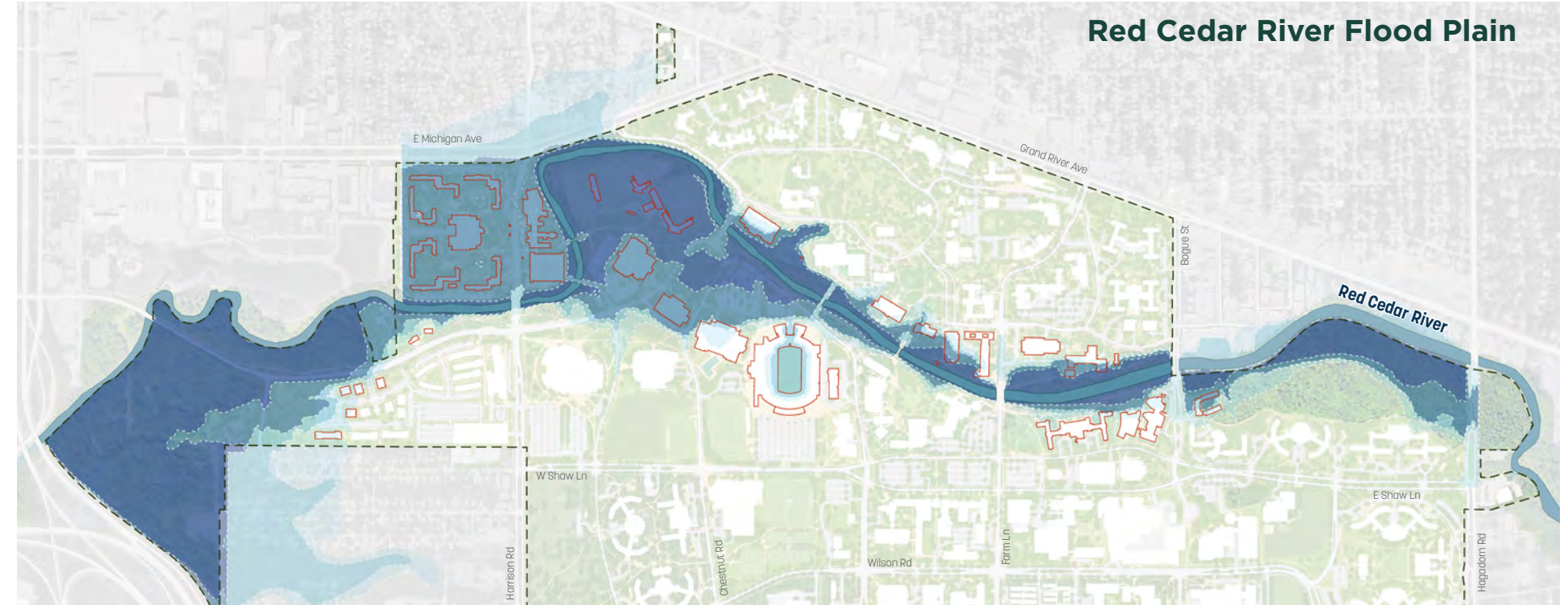
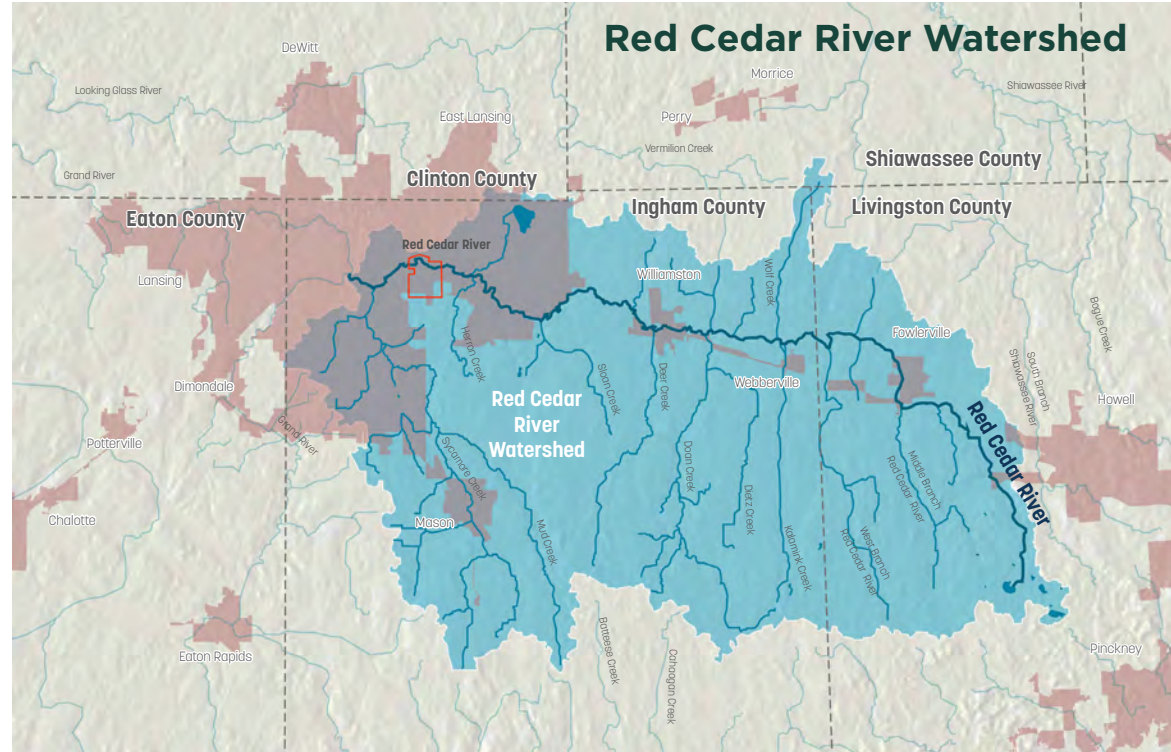
Flood Resilience: Watershed Context

The MSU Campus is situated in the Red Cedar River Watershed approximately 51 miles from where the river originates in Livingston County. Upstream in the 410 square mile watershed, the Red Cedar River meanders through farmland and open spaces, oftentimes with lakes on either side of the riverbanks. This allows for a broad floodplain, giving the river space to ebb and flow with increased water levels that come after large storm events.

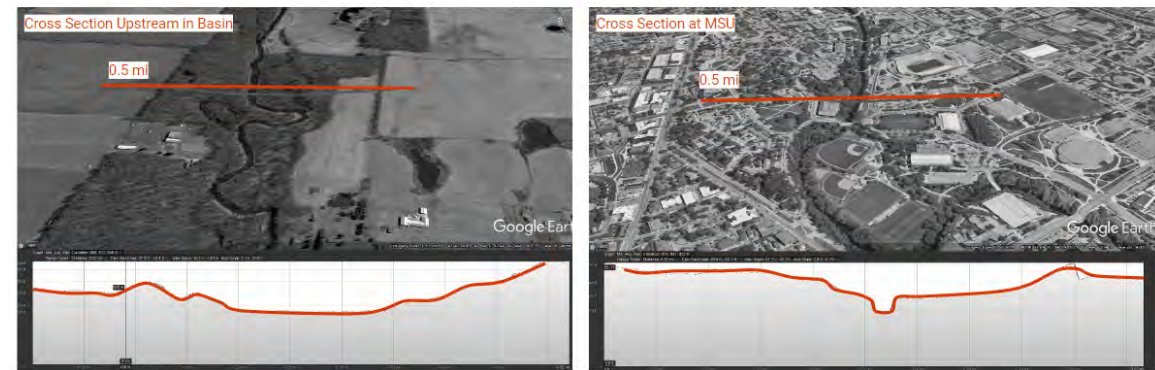
The 2-mile course on the MSU campus is intensely channelized, creating extreme flood conditions. These conditions are intensified by the campus's location relative to the confluence of the Red Cedar River, the Sycamore Creek, and the Grand River in Lansing. The river does not have space to safely expand into its floodplain as it does upstream. As water levels rise during storm events, water overwhelms the banks and puts critical infrastructure at risk. Currently, Spartan Stadium, the athletic fields to its northwest, and the remainder of campus downstream on the north side of the river fall within a flood hazard area. This hazard area also extends into the west side of the University Village Apartments on the south side of the river.

The peak flow along the Red Cedar River on MSU campus typically comes 24 to 36 hours after a storm event. As a result of this delay, successive storm events can pose compounding flood risk.

Currently, the MSU campus is managing flood resilience through monitoring during large storm events. The campus tracks rain gauges to evaluate rainfall events and forecast if the river will flood. If projections point to a 10-11 foot flood level, flood barriers are assembled to protect campus infrastructure.



NATURAL VS. DEVELOPED STREAMBANK



Flood resilience on campus is increasingly important in the face of a changing climate. Infrastructural resilience protects facilities that serve day-to-day safety and wellbeing of the community on campus. Nature-based solutions to flood mitigation can also enhance open spaces near the river through the creation of ecological corridors and riparian areas. Such spaces also makes the river more accessible to faculty, students, and visitors, creating a usable interface and enhancing the overall sense of place.

- Red Cedar River
- 10-Year Flood Plain
- 50-Year Flood Plain
- 100-Year Flood Plain
- 500-Year Flood Plain
- MSU Buildings in Flood Plains

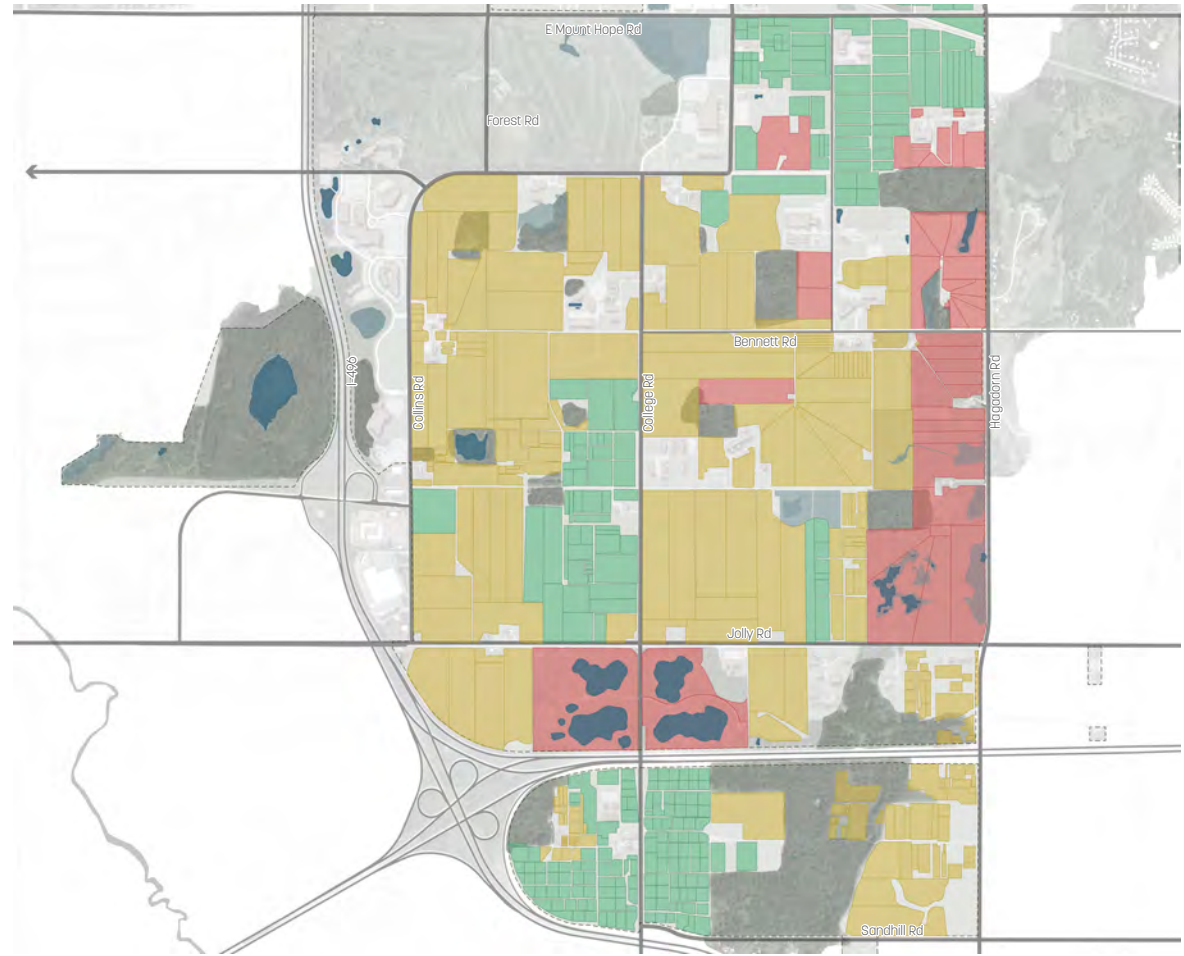
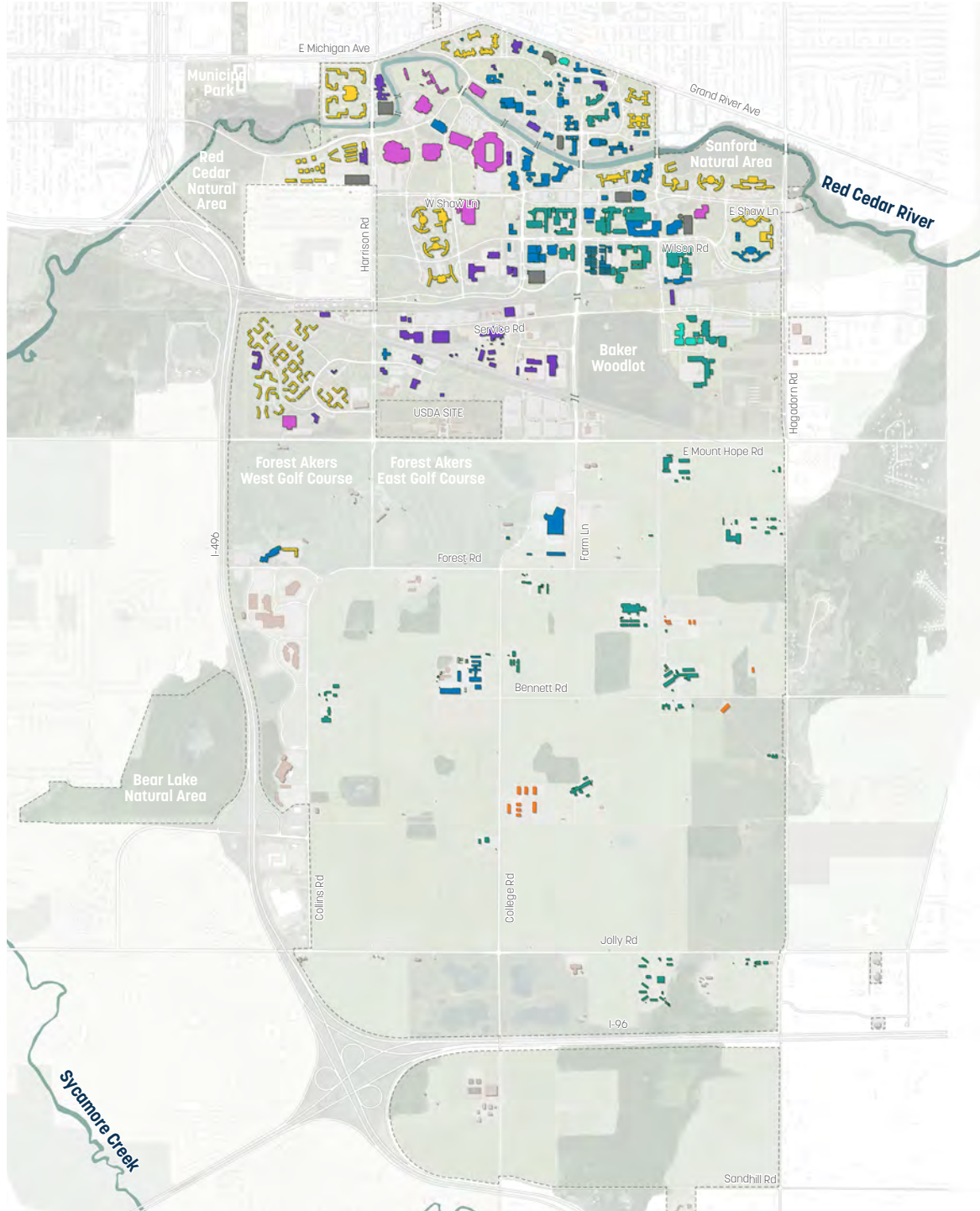
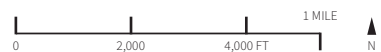


Land Use

The scale and context of MSU's East Lansing campus relates to various adjacent land uses along the campus perimeter. To its north, the historic North Campus fronts a vibrant commercial corridor along Grand River Avenue. To the east and west, the outskirts of Lansing and Meridian Township provide a more suburban context with larger scaled land uses such as shopping centers, residential developments, office parks, and medical facilities. The campus is primarily flanked to its south by agricultural land uses.

The variety of land uses surrounding the MSU campus support the diversity and breadth of land uses within campus. A spine of academic and research functions stretch north to south along the historic Farm Lane corridor from Grand River Avenue to Wilson Road, as well as an emerging Biomedical Discovery Neighborhood along Service Road just west of Hagadorn Road. At the periphery of this academic and research core sits significant residence halls, and facilities for athletics and recreation. Further south, most lands beyond Mount Hope Road support AgBioResearch; these account for approximately 60% of the campus lands and support research and learning in agricultural and natural sciences and veterinary medicine.

- Existing Academic
- Existing Research
- Existing Clinical
- Existing Athletics
- Existing Housing
- Existing Admin/ Support
- Existing Structured Parking



Agricultural Land

Land Suitability

Of the three levels of land suitability, crop production and grazing has the largest area with 1,091.9 acres. The area suitable for agronomics and horticultural research is the second largest with 574.4 acres, and the area only suitable for grazing occupies 414.3 acres. A significant area has been subject to improvements, especially along the western side of College Rd and south of I-96.

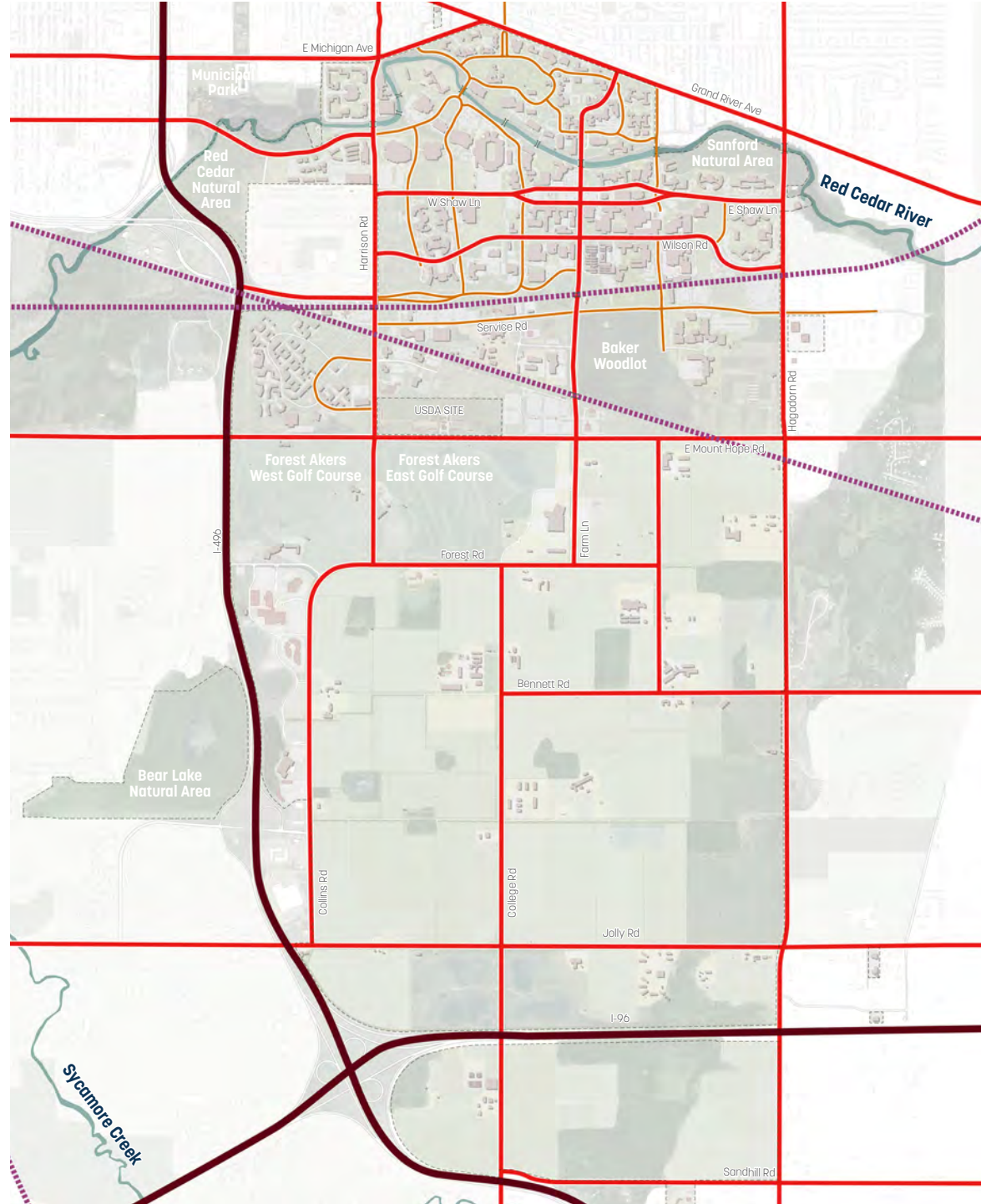
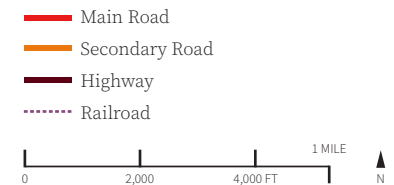
- Suitable for Grazing Only
- Suitable for Crop Production and Grazing
- Suitable for Agronomic & Horticultural Research with Adequate Drainage
- Unique Improvements (ie Fruit Tree Plantings, Irrigation System)

Mobility

Mobility Overview

The East Lansing campus is dominated by road patterns that reflect the region's agricultural history, with a regular grid of roads and lanes connecting the campus to its context. Interstate highways 96 and 496 traverse its southern and western edges and provide regional and state-wide connections to the campus. The organization of the historic North Campus is park-like in nature, with East and West Circles navigating the campus in an organic fashion, creating a pedestrian-oriented precinct. South of the Red Cedar River, the campus organization reflects the period of post-War growth; it is highly auto-oriented and defined by a series of super-blocks, surface parking, and sprawling land uses. While pedestrian and bicycle mobility is possible, the circulation systems largely prioritize vehicular mobility.

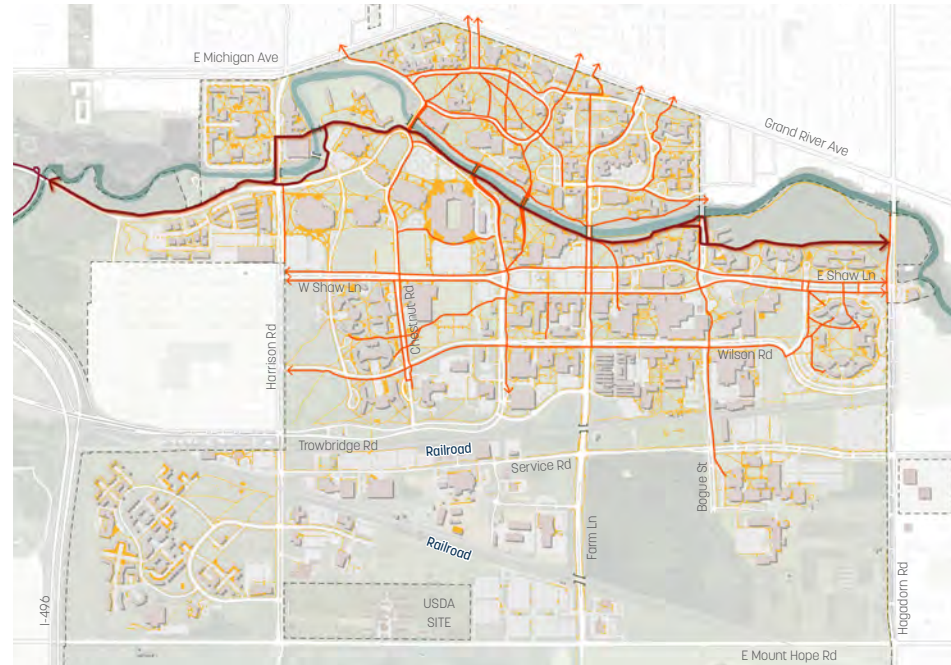
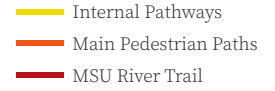
The Capital Area Transit Authority (CATA) operates regular bus services that traverse the campus and extend into the surrounding community. Because these routes are administered independently from the university, the routes and timing are not always well-aligned to the patterns of circulation that would best serve the campus population. This misalignment and the large amount of parking immediately adjacent to many of the university's facilities reinforces the highly automobile-centric mobility patterns.



Pedestrian Network

The MSU campus is pedestrian-friendly, especially the historic North Campus. Like many campuses, it is more challenging to cross the perimeter roads to and from campus. Improved and additional crossings for Grand River Avenue, Harrison Road, and Hagadorn Road will make it easier for students and staff to travel off campus without a vehicle or to access the MSU campus by walking and bicycling for those who live nearby.

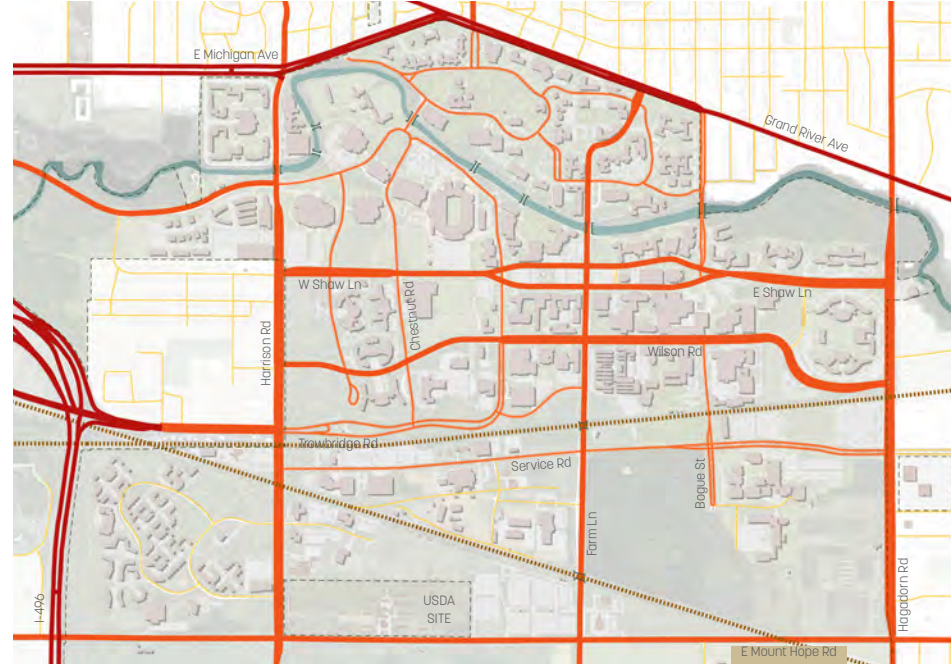
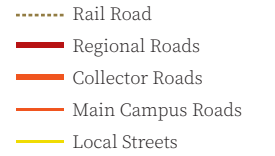
The size of the MSU campus is very suitable for travel by bicycle and scooter. Existing bike racks and facilities, such as the bike lanes along the Red Cedar River, are well-used. Additional secure bike parking and bicycle lanes will encourage greater use of bikes and help to reduce parking demand. The MSU Bikes Center currently offers bikes for rent, but a robust shared bike network for the MSU campus and nearby neighborhoods would facilitate greater use of bikes.



Vehicular Mobility and Parking

Aside from the areas adjacent to East and West Circles, most of the campus is highly auto-oriented and defined by a series of super-blocks.

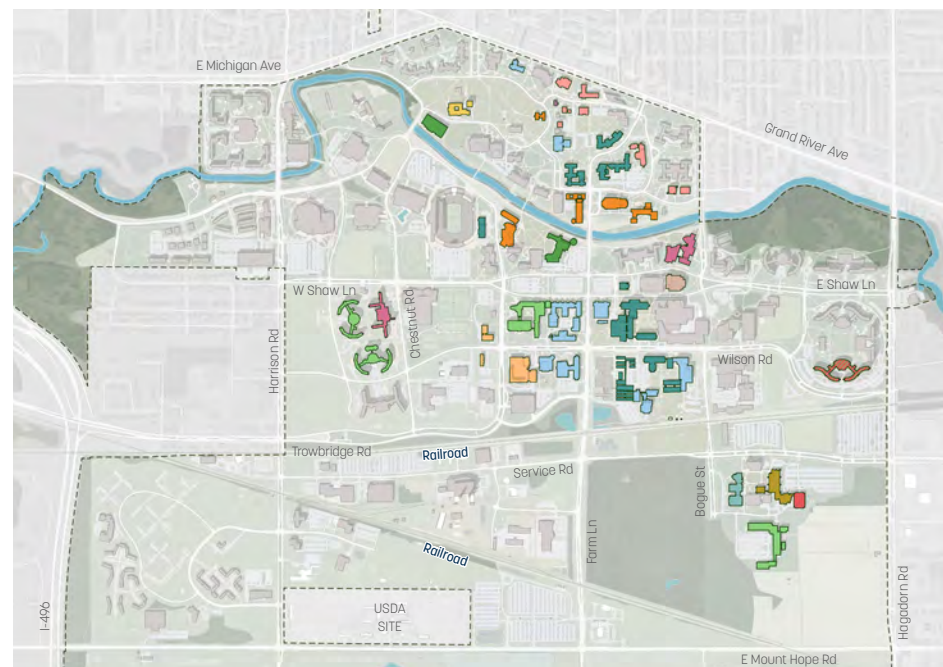
Due to the geographically dispersed campus, parking is widely distributed across campus. In the historic parts of campus, it tends to be more discretely located whereas in those parts of campus developed post-World War II, it often occupies the space between "object" buildings and the street edge, which may challenge the ability to promote pedestrian connectivity.



Teaching and Learning

Of the East Lansing campus's approximately 11,000 NASF of non-residential and athletic space, almost 15% of space is devoted to teaching and learning. This includes approximately 625,000 NASF of formal classroom space (lecture halls, classrooms, seminar rooms), 490,000 NASF of instructional lab space, 55,000 NASF of open lab space, and 510,000 NASF of library and study space.

Academic functions are predominantly clustered in the north-south corridor along Farm Lane between Grand River Avenue and Service Road. A second cluster of biomedical and health-sciences-related academic facilities are within a precinct to the southeast along Service Road between Hagadorn Road and Bogue Street. Additionally, peripheral academic functions are located within Fee Hall, IM West, and the Kellogg Hotel and Conference Center.

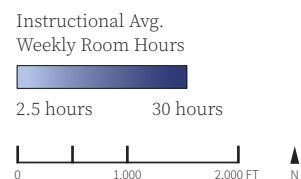


College Distribution

The degree of unit-level concentration varies. Some units, such as Education, Social Sciences, and Engineering, are distributed across different parts of the campus. Other units, however, are relatively compact and contained to a few adjacent facilities; these include Nursing, Communication Arts and Sciences, Music, Business, and Osteopathic Medicine.

The level of distribution or concentration impacts the ability to develop cross-disciplinary relationships and the ability to develop distinct, external identities.

- | | |
|--|---|
| ■ Agriculture and Nat Resources | ■ Natural Science |
| ■ Arts and Letters | ■ Nursing |
| ■ Communication Arts Sciences | ■ Osteopathic Medicine |
| ■ Education | ■ Social Science |
| ■ Engineering | ■ Business |
| ■ Human Medicine | ■ Law |
| ■ Music | |



Research and Innovation

Research laboratory space accounts for approximately 1,500,000 NASF of space on MSU's East Lansing campus. The number far exceeds that figure when considering office and support space for faculty and staff engaged in research activities on campus. The College of Agriculture and Natural Resources, College of Engineering, College of Natural Science, and Facility for Rare Isotope Beams are the most significant occupants of the University's research space portfolio.

Research facilities are predominantly focused in three clusters; the most significant of these straddles Wilson Road from Red Cedar Road to just east of Bogue Street and includes Engineering, Agriculture and Natural Resources, Natural Sciences, and Biology and Physical Sciences.



A second, smaller cluster is centered along Farm Lane in North Campus and supports a mix of Natural Sciences and Agriculture and Natural Resources. Finally, a third cluster of Biomedical Science has experienced significant growth in the past decade and is located in the Southeast Campus along Service Road between Bogue Street and Hagadorn Road. The majority of research lab space is consolidated south of the river.

