Facilities & Infrastructure Report 2009

Vice President for Finance & Operations
February 13, 2009

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Executive Summary

Michigan State University is a public institution located in East Lansing, Michigan. The main campus is 5,200 acres which includes 579 buildings (85 with instructional space) and 18 miles of roads. The University supports over 45,000 students and 10,000 employees.

For this report on facilities and infrastructure, administrative units were asked to be self critical in analyzing problems, performance, and emerging issues. No attempt was made to prioritize issues across the report. As a result, the report illustrates both challenges and triumphs for operational units.

MSU continues to use the Just-in-Time method to address replacement and repair of its infrastructure. JIT has helped MSU reduce its backlog of maintenance projects. However, due to market conditions, the funding source for JIT will decrease. The challenge becomes managing the maintenance needs of the university with limited resources.

Construction and quality of the construction process continues to improve. However, despite substantial completion rates of 100 percent, final completion rates are only 14 percent. The incorporation of contractor and owner scorecards, and implementation of change order recommendations by the School of Planning, Design & Construction keep quality and on-time completion a primary focus in the construction process.

Environmental stewardship and the university's power and water needs has been a top concern of many administrators. High fuels costs have been a factor in tuition increases. Furthermore, world leaders continue to focus on energy management and climate change. Michigan State University has implemented several programs under the Environmental Stewardship Initiative, engaging student, faculty, and operational enterprises along the way. Much progress has been made, but despite slowing the slope of energy demand and an increase in waste diverted from the landfill, MSU continues to increase its overall consumption.

Transportation plays a large role in environmental stewardship through reducing greenhouse gas emissions and providing alternative transportation. MSU Bikes is the only university operation of its kind in the Midwest and has become a leader in showing other institutions how to provide accessible bike transportation in a campus setting. Transportation Services has also made efforts to reduce its carbon footprint by proactively exploring energy efficient technologies, right sizing the fleet to meet university needs, and reducing its environmental impact.

With over 55,000 students and employees, safety and security remains a top priority. In 2008, several colleges and universities saw catastrophic flooding which threatened their infrastructure. MSU is being proactive in planning for floods as well as other emergencies. Units continue to explore new training and technologies to prepare MSU for improving the current system and addressing potential risks.

This report also shows how MSU is making use of its central campus and off-campus space. MSU is taking care to manage its academic spaces, but also using its public spaces to infuse art and culture through its public art program.

This report shows a snapshot of the state of the facilities and infrastructure at this point in time. The data and analysis are based on decisions made by the Board of Trustees to date. Future Board decisions may change projected data or conclusions. For example, if there is a Board decision made to demolish a building, the Just-in-Time projections will decrease. Furthermore, due to the size and complexity of the institution, there are likely several topics that may not have made it into this analysis. MSU continues to invest a significant amount of time, intellect, and resources to support the teaching, research and outreach missions of the university. Those who manage the facilities and infrastructure will continue to self-analyze and reflect on ways to address current and future challenges to support the university community.

Fred L. Poston
Vice President of Finance and Operations, Treasurer

JUST-IN-TIME

Introduction

The Just-In-Time (JIT) facilities evaluation process requires a comprehensive review of all campus infrastructure components in order to determine their condition, estimate their failure date, and schedule necessary repairs. The industry-predicted life-cycle (typically years before the replacement is needed) of infrastructure systems is used as the starting point for potential replacement. This method is commonly referred to as deferred maintenance. This number is adjusted to account for actual university experience with the life-cycles of essential components. Observations are made in the field during preventive maintenance and testing of building system components. This refined JIT information is collected in a database and used to predict annual maintenance and replacement costs for the next 20 years.

With the JIT approach, the intent is to predict when critical infrastructure components are approaching failure. This allowed the university to keep up with the JIT needs. Accurate assessments of future JIT needs make it possible to coordinate JIT projects with other active construction and renovation projects, thus allowing them to be combined when beneficial. However these opportunities will go away with fewer funds available. The advantage of this planning approach is that campus disruptions and multiple repairs at the same location are minimized, and project costs are often reduced. This protocol also provides the opportunity to manage the funding of these projects with greater flexibility.

When the Just-In-Time process was developed in 2000-01, MSU had an estimated deferred maintenance backlog of approximately $360 million for General Fund infrastructure work. As JIT implementation progressed, the $360 million backlog figure was reevaluated in the light of MSU field observations and integrated into the projections for future infrastructure needs. The result was a 20 year projection of JIT needs. The JIT process tracks facility needs in three time scales: 1) Zero to five years, 2) Five to ten years, and 3) Ten to twenty years. The needs for the first five years are determined by an analysis based primarily on field inspections; projections for the five to ten year period are determined by industry life-cycles adjusted for MSU experience; and the remaining ten year forecast is determined by industry life-cycle alone. The JIT system has been effective in addressing the original $360 deferred maintenance figure. As of last fiscal year, there is no remaining backlog for deferred maintenance.

Analysis

In the 2007-08 64 JIT projects, valued at $32 million, were funded. Of these projects, 43 (67%) addressed building needs, 17 (27%) addressed utility and power and water needs, and 4 (6%) addressed road repairs. There was $10 million of unfunded JIT needs due to the redirection of JIT resources to the Farm Lane Underpass Project in FY 2007-08.

The General Fund 20 year JIT forecast identifies $560 million of work that must be performed in order to preserve the safety and reliability of the university infrastructure. This is slightly higher than last year's forecast of $548 million, primarily because of data refinements.

Securing adequate funding for each year's identified needs is critical to the management of the JIT program. The downturn in the economy and resulting loss of investment income is projected to significantly reduce the resources available for infrastructure projects for at least the next three years. Unfunded needs are transferred to the following year's list. Figure 1 shows the cumulative impact of reduced funding on 2012-13. The annual funding need will quickly compound to a point where it

reaches an unattainable level and such deferments increase the risk of infrastructure failure on each delayed project.

Over the past three years, Housing and Food Services (HFS) has also developed a database to track JIT needs. During this time, HFS has made significant progress by reassessing its JIT infrastructure needs using the same guidelines and criteria as those used for the general fund. One notable difference, however, is that HFS is uniquely dependent on marketability as a factor in the assessment of their facilities. As a result, many furnishings, fixtures, and equipment appear as JIT items for HFS facilities that would not appear on the list for facilities supported by the general fund. HFS currently projects its JIT 20 year funding need at $555 million.

General Fund

Five categories comprise the JIT infrastructure needs for the General Fund facilities: buildings, utility distribution systems, power and water systems, sidewalks and roads.

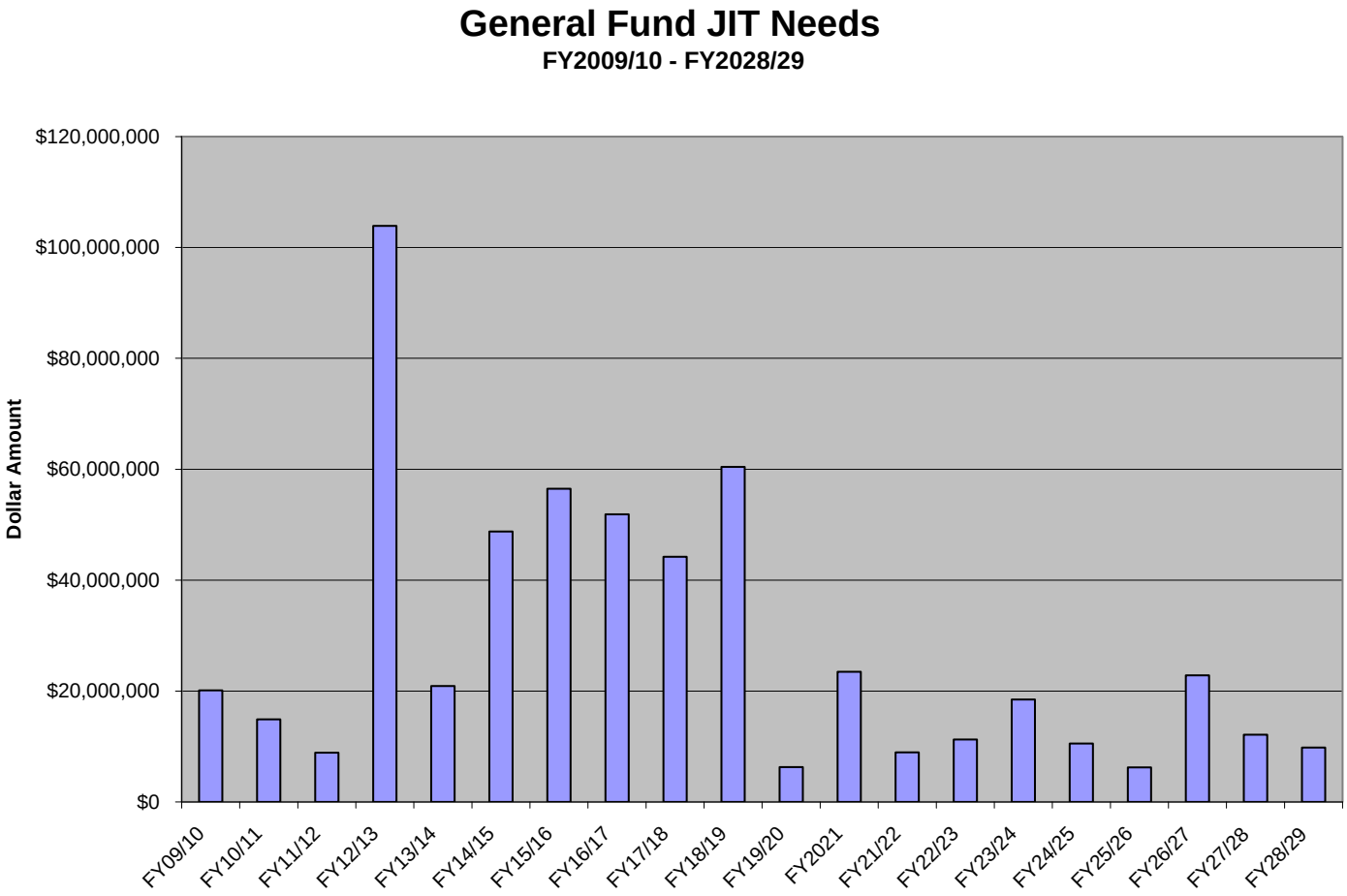


Figure 1. Annual General Fund JIT Needs for the next 20 fiscal years

In recent years, endowment trust earnings have been the primary source of funding for JIT projects. For 2009-10 through 2011-12, it was anticipated that approximately $60 million would be available from that source. The sharp downturn in the economy has reduced the amount of funding likely to be available to $16 million – a $44 million difference. Because of this reduction, many JIT projects from 2009-10 through 2011-1212 have been delayed until 2012-13, and Figure 1 reflects this with a

dramatic spike in JIT needs for that year. Even if the original $60 million allocation had been available, the amount of JIT work needed in 2010-12 would have exceeded the $60 million funding by $28 million. The adjusted allocation numbers boost that shortfall to $72 million for this 3 year period. Specifically, there were delays of $36 million in building projects, $25 million in utility projects, and $11 million in road repairs from 2009-10 through 2011-12.

Years 2014-15 – 2018-19 are also a concern, with the annual funding need ranging between $40 million and $60 million. These substantial targets will be difficult to realize. Maintaining the key components of the campus infrastructure system while operating near failure will be a challenge. JIT funding needs after 2019-20 are considerably less and it may be possible to begin to catch up on work which has been carried forward from prior years. However, the projected costs may increase as the data for the outlying years is refined.

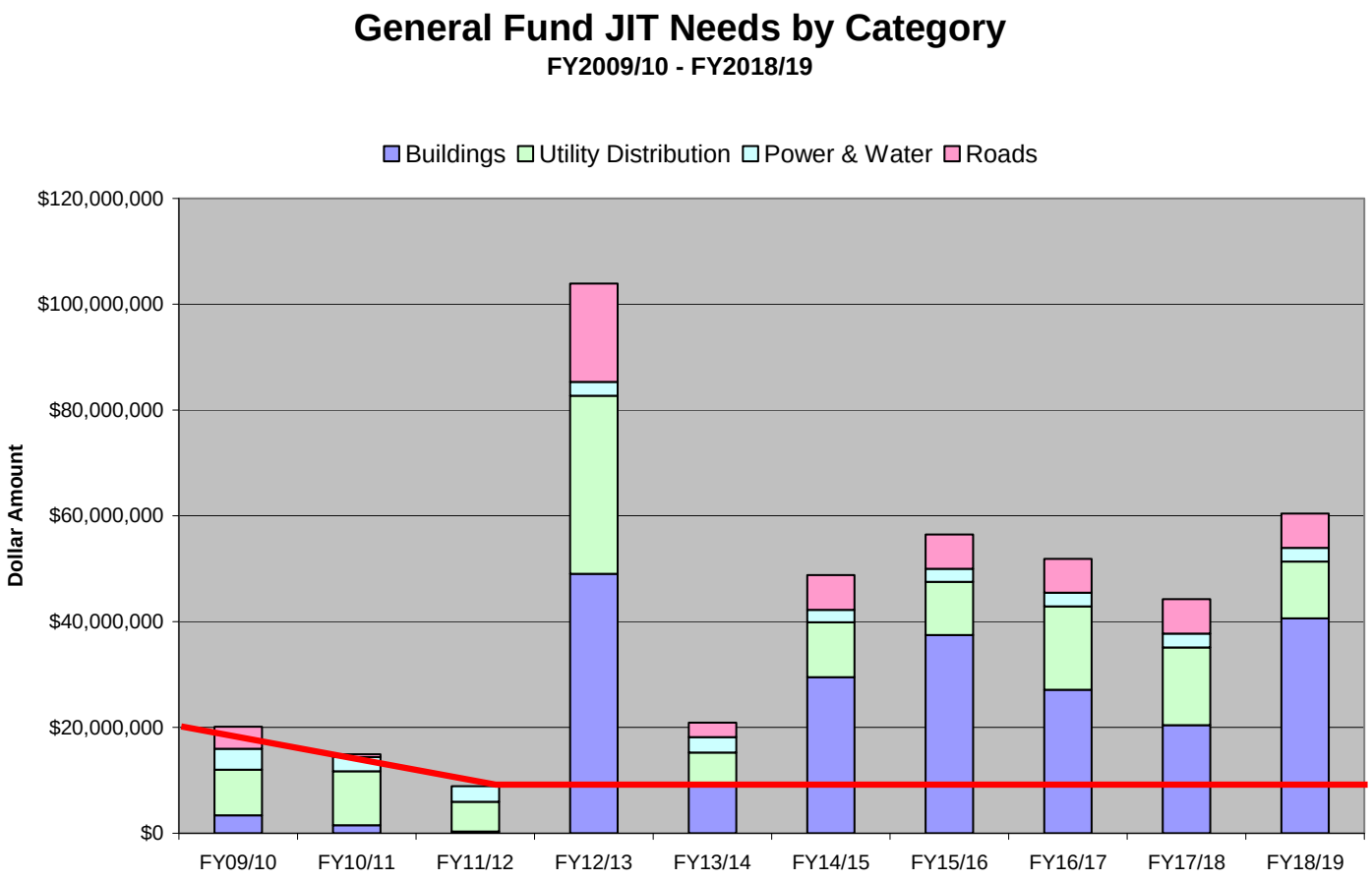


Figure 2. Annual General Fund JIT needs from fiscal year 2010 through fiscal year 2019 for buildings, utility distribution, power and water, and roads. The red line shows the anticipated average of funds available for JIT.

A more accurate analysis of JIT needs is provided by field inspections, which are incorporated into the 10 year outlook. The data can reveal trends that are developing within each General Fund category (Figure 2). Between 2012-13 and 2018-19, funding needs for both Power and Water and Roads become more stable while building and utility distribution needs fluctuate. During that time, many of the building systems and campus utilities constructed in the 1950's and 60's will reach the end of their adjusted life cycles. Based on past experience, it is projected that a significant number will either need major maintenance or replacement within this period.

The largest percentage of JIT needs for the next ten years are in the Buildings category, which has three components: the building envelope, building systems, and interior finishes. Emphasis has been placed on building envelope projects as the highest priority, in order to preserve the protective barriers which shield the elements. Examples of these projects include roofs, exterior masonry, windows and doors. High priority is also being given to building systems projects, which include HVAC systems, building electrical systems, elevators, and plumbing. If left unaddressed, building systems failures will result in significant interruptions to the operation of a particular facility. In fiscal year 2008-09, 47% of JIT funding for buildings were committed to building envelope projects, and 52% went to building systems.

The third component of the JIT buildings category is interior finishes. This component, which includes floors, walls, interior doors, toilet partitions, and ceilings, is given the lowest funding priority. Only interior projects that could result in safety hazards if neglected are considered for JIT funding. In fiscal year 2008-09, 1% of JIT funding for buildings was used for interior finish projects. Continuing this approach into future years raises a concern that, over time, the appearance of older campus buildings will further decline.

Many of the steam tunnels located on the north part of campus are nearing one hundred years old. As a result, structural repairs are needed to these tunnels or even replacement in some cases. This JIT category accounts for increases in the utility distribution costs required over the next ten years.

A significant number of road upkeep projects have been completed in recent years. For the remaining projects, work continues as funding is available. Roads which have previously been reconstructed to current standards can usually be maintained by milling and recapping (patching small sections of the road) the surface. As a result, the JIT need for campus roads is projected to remain more stable in outlying years, contingent on future assessments of pavement condition due to winter weather.

A General Fund category still in development is campus pathways. While the cost to bring the pathways back to a serviceable condition is not of the same order of magnitude as for the other general fund categories, the problem must still be addressed. Funding for the on-going maintenance of campus pathways has typically been scarce. As result, repair work has not kept pace with needed maintenance and the aging pathway system has deteriorated. Approximately 20% of the 3.7 million square feet of pathways on campus (about 17 acres) have been categorized to be in poor or fair condition, characterized by cracked, broken, or settled concrete. Poor conditions inevitably affect the safety and serviceability of the walks. Some pathways are inadequate in width for the present needs of pedestrian or bicycle traffic.

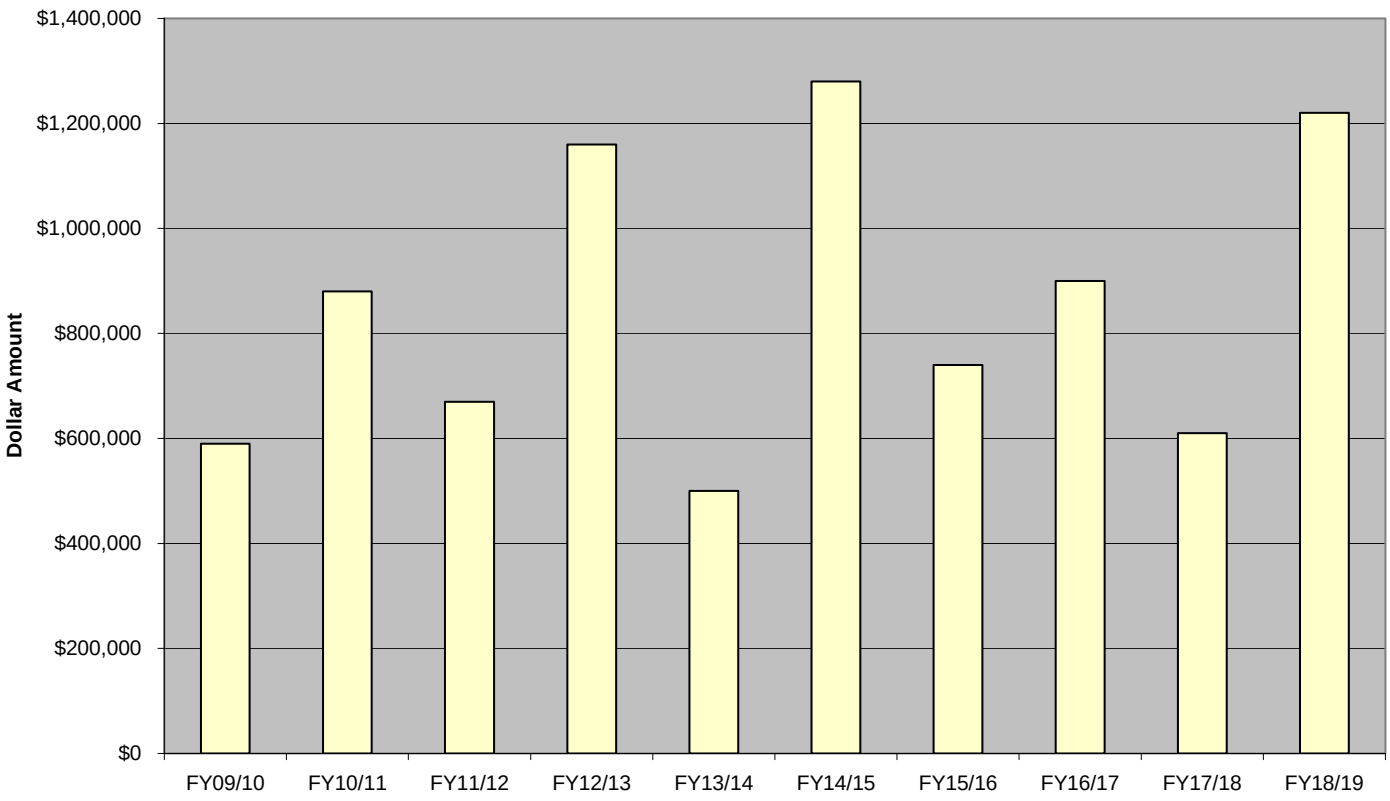


Figure 4. Annual General Fund JIT needs from fiscal year 2010 through fiscal year 2019 for campus pathways.

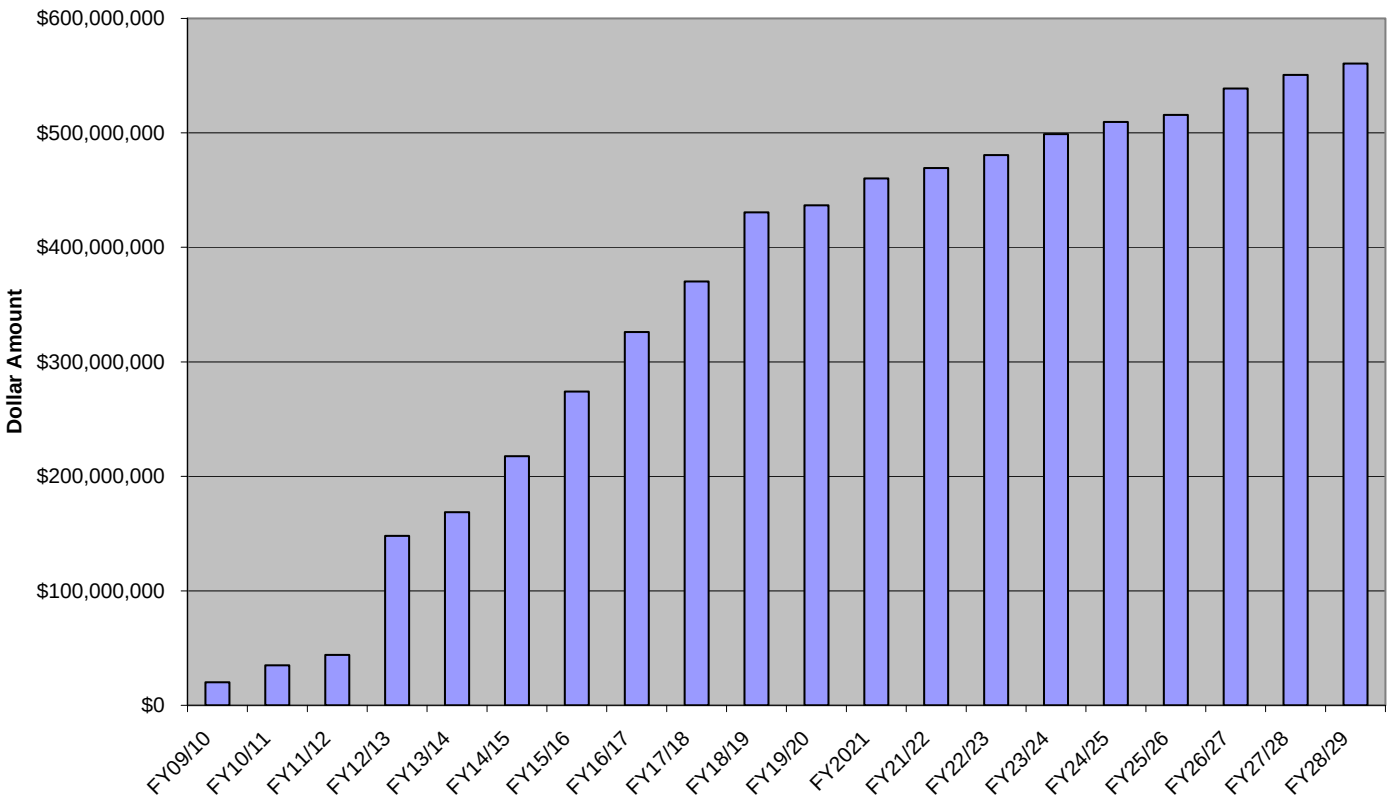


Figure 3. The cumulative growth of General Fund JIT needs for the next 20 fiscal years

If no JIT funding were provided for the next 20 years, the cumulative cost for deferred projects would equal $560 million by 2028-29. A critical period of growth in JIT funding needs occurs between 2012-13 and 2018-19. During these years the components of many buildings and systems which were constructed in the 1950's and 60's will reach the end of their adjusted life cycle. From 2019-20 through 2028-29, there is a much more gradual increase in JIT needs as the backlog of major maintenance challenges is addressed. It is possible, however, that these amounts may increase as more field observations are performed through time.

Housing and Food Services

The Housing and Food Services JIT needs for the next twenty fiscal years are evaluated in the information below.

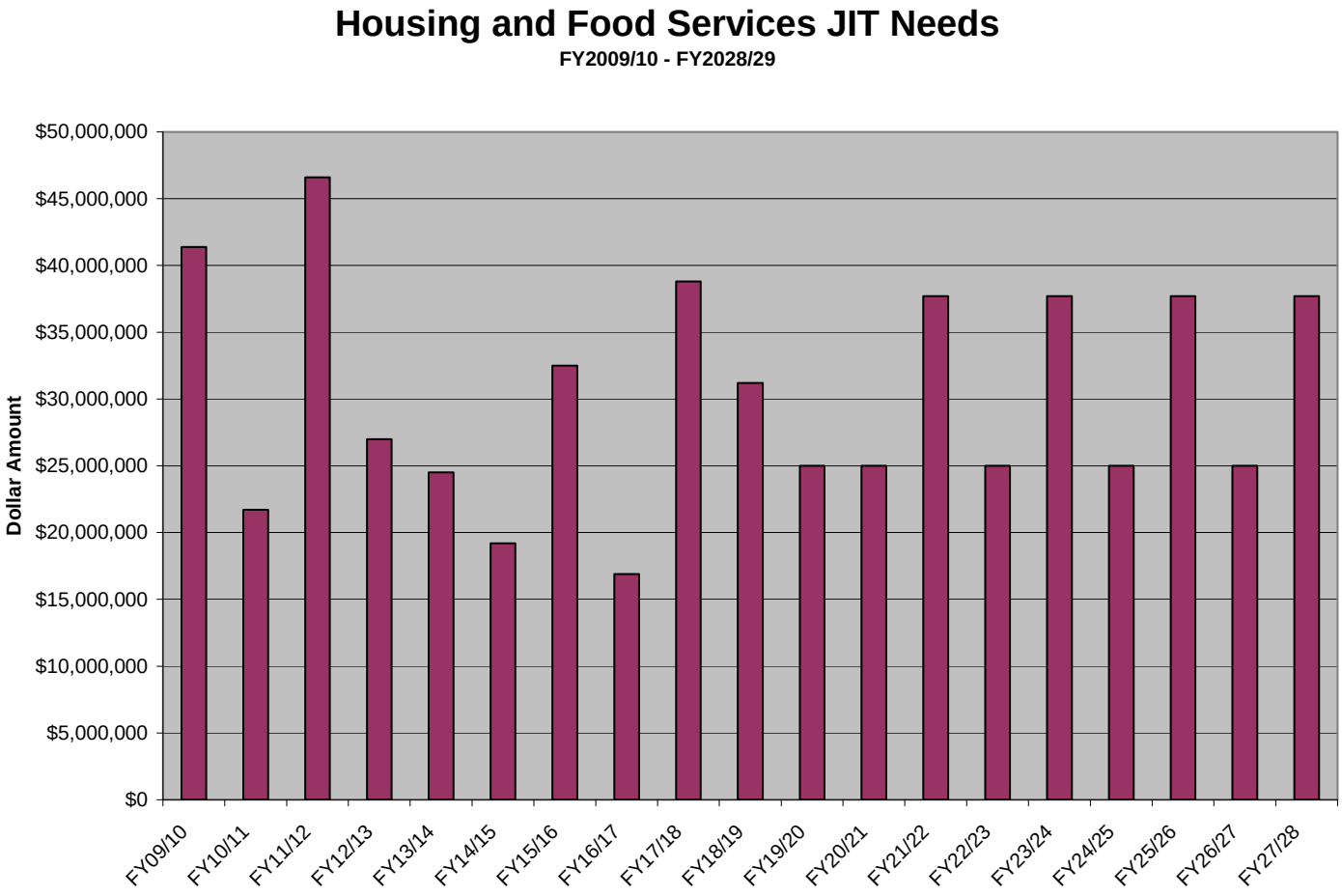


Figure 5. Annual Housing and Food Services JIT needs for the next twenty fiscal years

The 20-year JIT projections for Housing and Food Services (HFS) have increased substantially from $384 million in FY 2007-2008 to $708 million this year for two reasons. First, as HFS has shifted to using the same JIT categories as the General Fund, the twenty year cycle has been updated to reflect new, more comprehensive data. Second, over the past 15 months HFS has undertaken a comprehensive strategic planning process that studied every aspect of the division, from both facilities and operational points of view. This plan has outlined the need for a more aggressive facility improvement schedule which directly impacts the timing of JIT needs. Maintaining of a high quality appearance is required in residence halls and other entertainment facilities to encourage successful occupancy and use levels.

Individual residence hall projects in the Brody complex are forecasted to begin in 2010, with one building being off line continuously until 2016 when residence hall renovations will be complete in that complex.

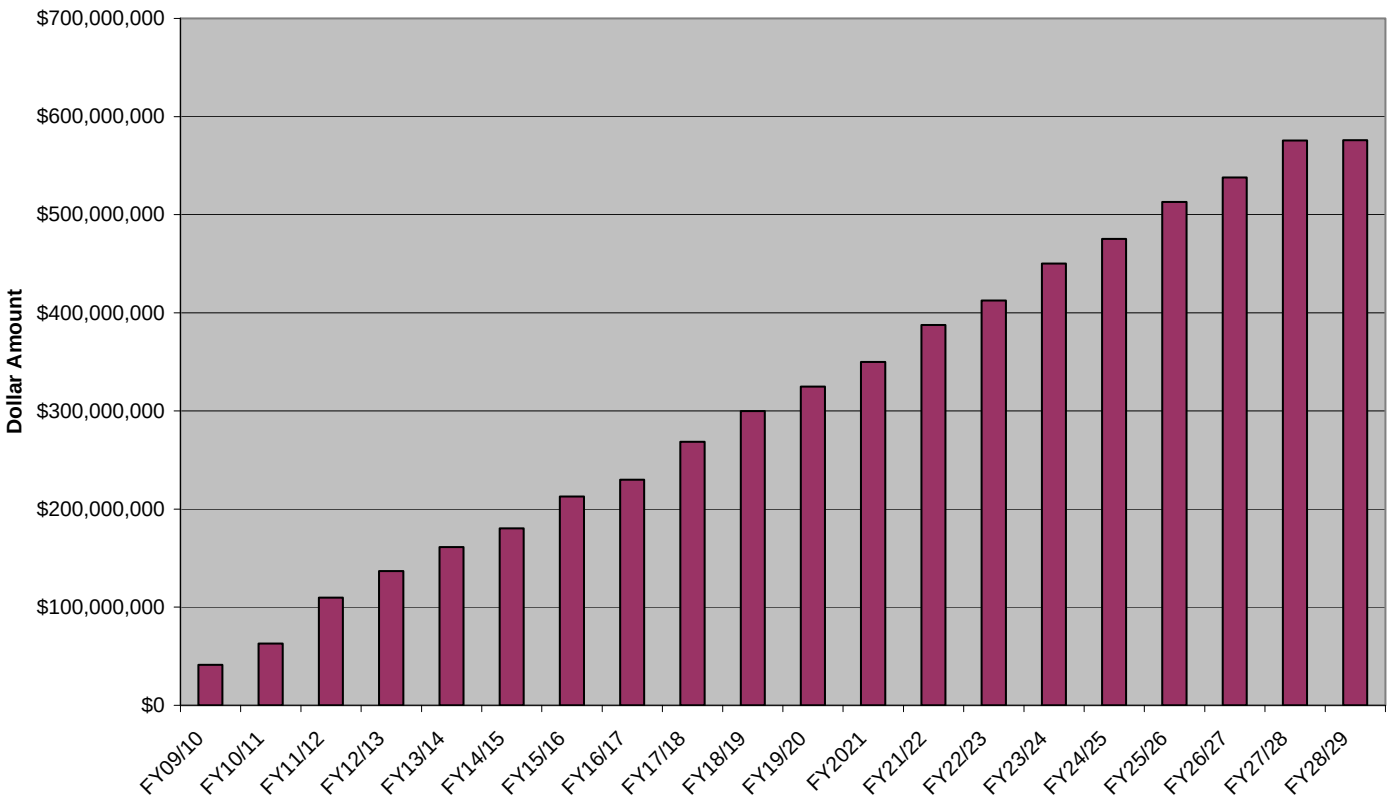


Figure 6. The cumulative growth of HFS JIT needs for the next 20 fiscal years

Over the next 20 fiscal years, the Housing and Food Services JIT needs will total nearly $555 million. JIT needs that are not addressed when scheduled will escalate the backlog. HFS's challenge is balancing the need to provide dynamic, attractive, flexible spaces with meeting the financial challenges to manage basic facility infrastructure needs.

Future Directions

The summary of general fund and JIT requirements shows the financial challenges facing the infrastructure at the university. If an adequate and consistent source of funding cannot be established, the university runs the risk of multiple failures within the various infrastructure systems. Special attention must be given to 2012-13 through 2018-19, which have the greatest funding requirements.

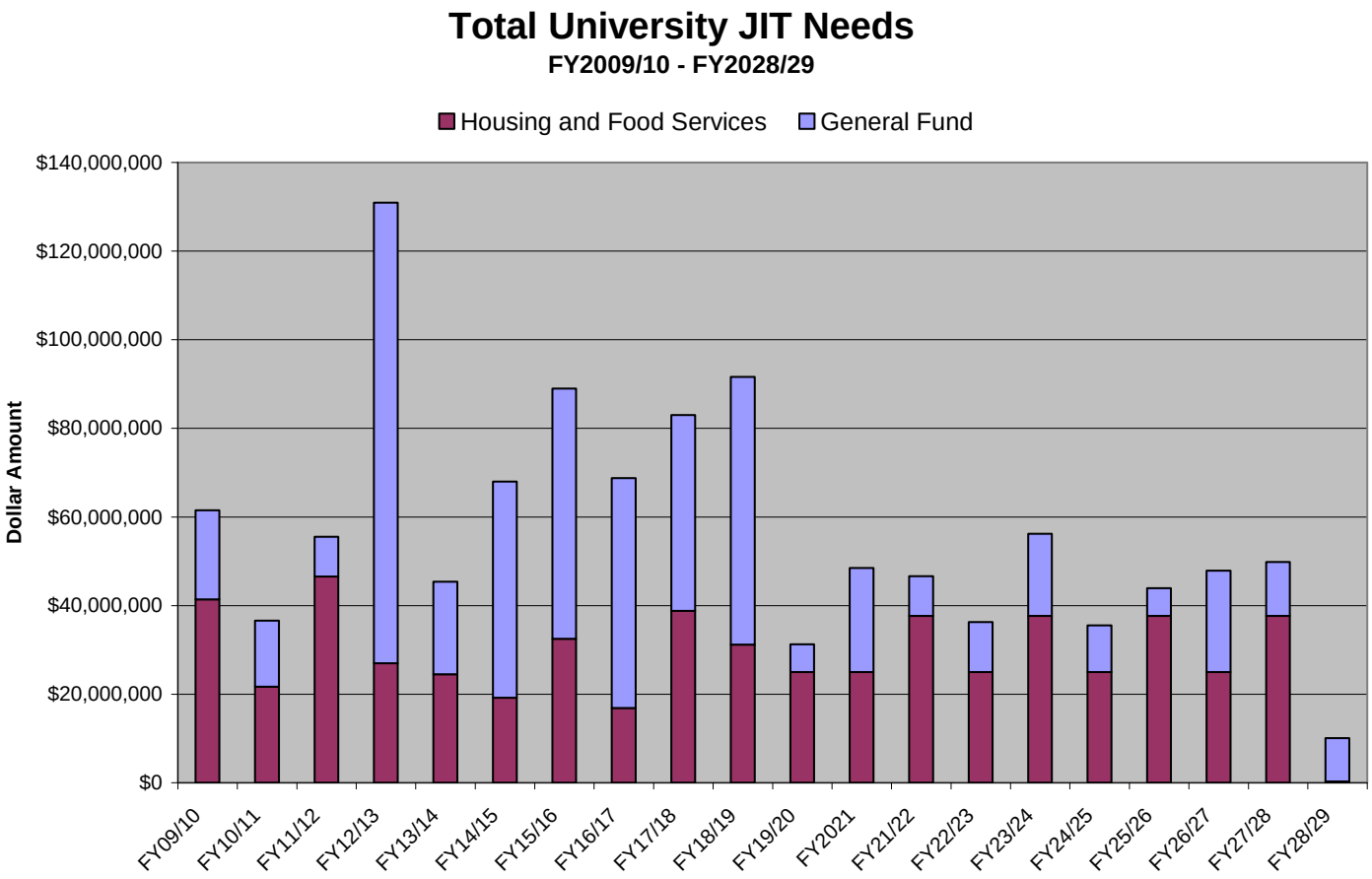


Figure 7. Annual JIT needs for the next twenty fiscal years includes General Fund categories and Housing and Food Services

Many of the “Just-in-Time” projects include the added benefit of energy savings when completed. Projects such as window replacements, roof replacements, exterior door replacements, chiller replacements and air handler replacements will in generally improve energy conservation by maintaining an air-tight building envelope, increasing insulation or installing up to date equipment that will operate more efficiently.

Using the most recent data, the combined value of General Fund and Housing and Food Services JIT needs for the next twenty fiscal years will exceed $1.1 billion, with half of that amount attributed to the General Fund and the other half attributed to Housing and Food Services.

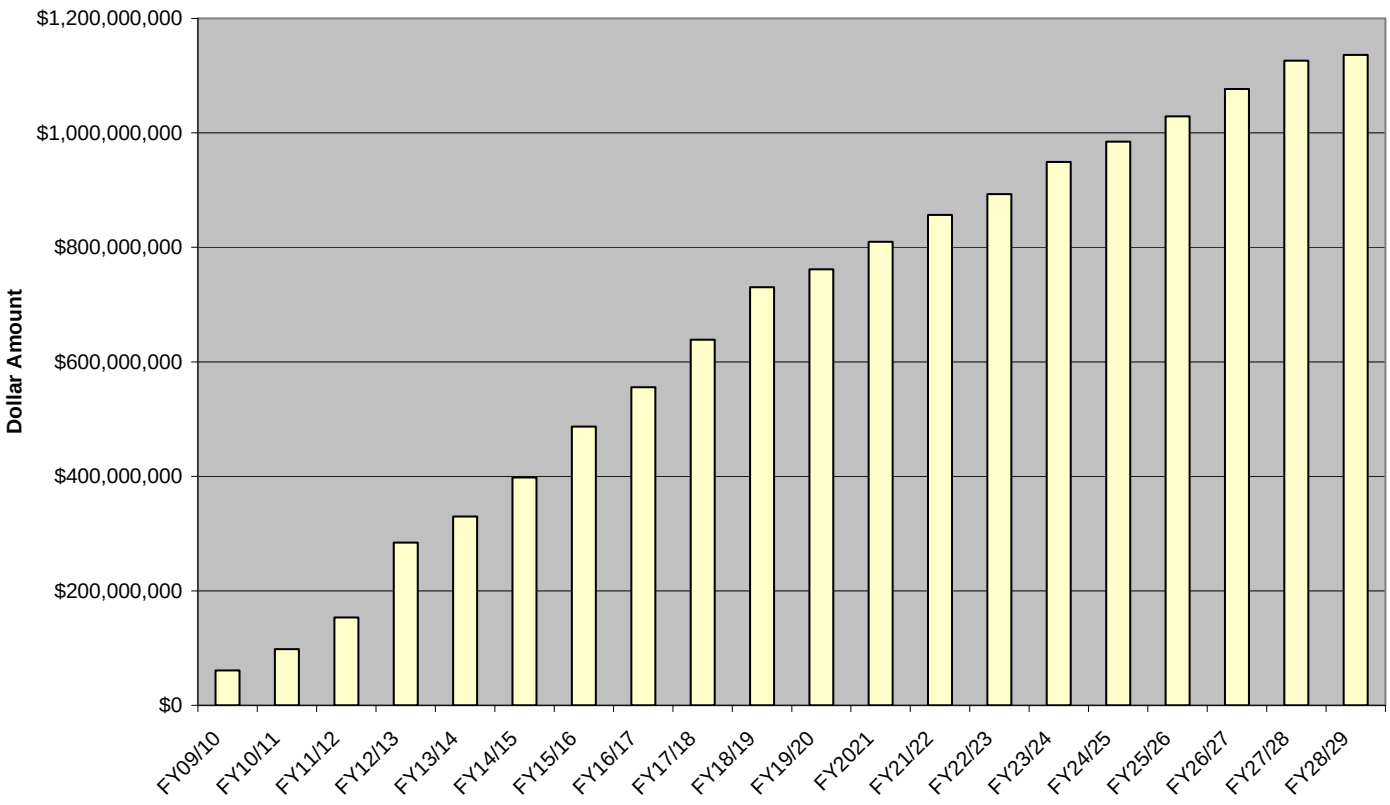


Figure 8. The cumulative growth of General Fund and Housing and Food Services JIT needs for the next 20 fiscal years

There are some major challenges facing the University when addressing JIT in the years ahead.

- Declining investment portfolio performance threatens to reduce resources for JIT, delaying a significant number of projects to future years. This will have a negative impact on the effectiveness and safety of an already aging campus infrastructure system.

- Replacement criteria for JIT for windows, chillers and other energy saving projects may be revised due to the impact on reducing energy demand.

- Campus pathways, parking ramps, and parking lots are also being evaluated for JIT needs so funding will be required for these areas as well. The concern is that more work will have to be done with fewer resources.

CONSTRUCTION

Summary

Given that adequate facilities are vital for MSU to perform its missions of education, research, and outreach, the University continues to invest heavily in design and construction. For the past 4 years, payments to contractors have comprised at least 5% of the total university budget. This volume will continue, as the Board of Trustees authorized an unprecedented amount of construction during FY 2007-08. Much of the work is outside East Lansing, including projects in Grand Rapids, Detroit, and Dubai.

MSU has improved performance in several areas. The majority of projects have been completed by the required substantial completion date and within budget. Progress has been made in meeting final completion and reducing change orders caused by design issues. More feedback is being given to contractors to facilitate process improvements and better overall performance. Projects are tracked through the Facilities Asset Management Information System (FAMIS) and Skire Unifier software to provide timely and accurate project information, and to report on project performance as a whole. The data provides the opportunity to analyze our strengths and weaknesses to improve processes. As the projects continue to increase in volume and complexity, MSU examines processes and implementing improvements in project management that engage designers, contractors, and the campus community.

Analysis

Annual Construction Report

The annual construction report that reviews completed projects for the Board of Trustees is included in the report appendix. Appendix A lists 37 major and minor capital projects with a value of $35 million that were closed in FY 2007-08. These projects were completed on average at 7.2% under budget. Quarterly reports for active projects have also been sent to the Board of Trustees.

Project Approvals

The Board took 46 actions construction projects during FY 2007-08, including authorizing 15 for authorization to plan, 20 for authorization to proceed, and 11 for bid and contract award. Figure 1. Since Design Build and Construction Management projects do not require bid and contract award,, the Board authorized construction on 19 projects for a total of $186 million, Figure 2. This unprecedented amount includes projects such as the Secchia Center, the MSU Surplus & Recycling Center, the Wharton Center for Performing Arts - Additions, Cyclotron - Office and Low Energy Research Additions, and Mary Mayo Hall Renovations. This does not include the Farm Lane Underpass project, which is managed by the Michigan Department of Transportation, or pending projects such as the Broad Art Museum, Brody Renovations, Power Plant Fuel Handling Modifications, Life Science College of Nursing Addition, or the Parking Ramp 2 replacement.

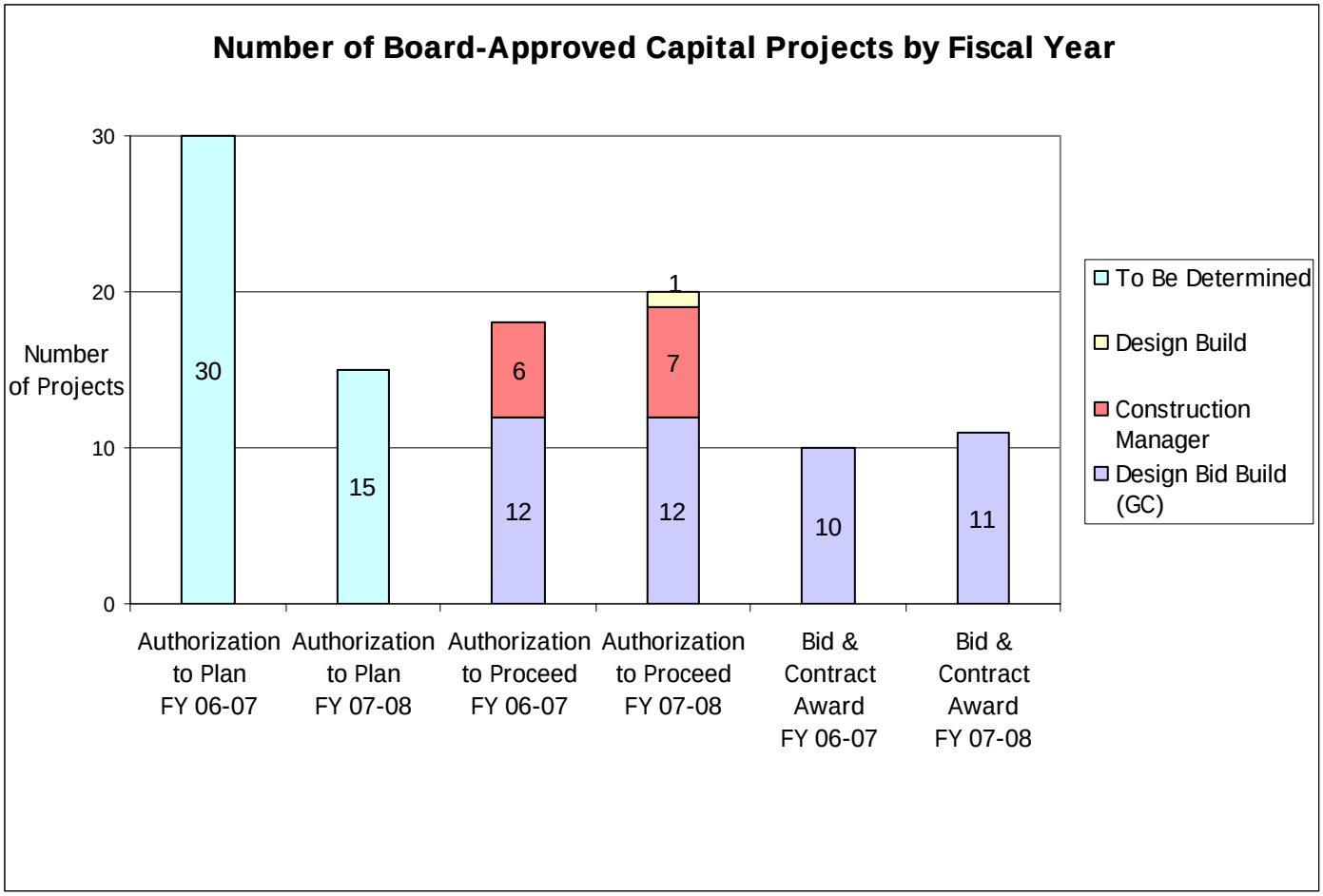


Figure 1. *Capital Projects Submitted for Board of Trustee action.*

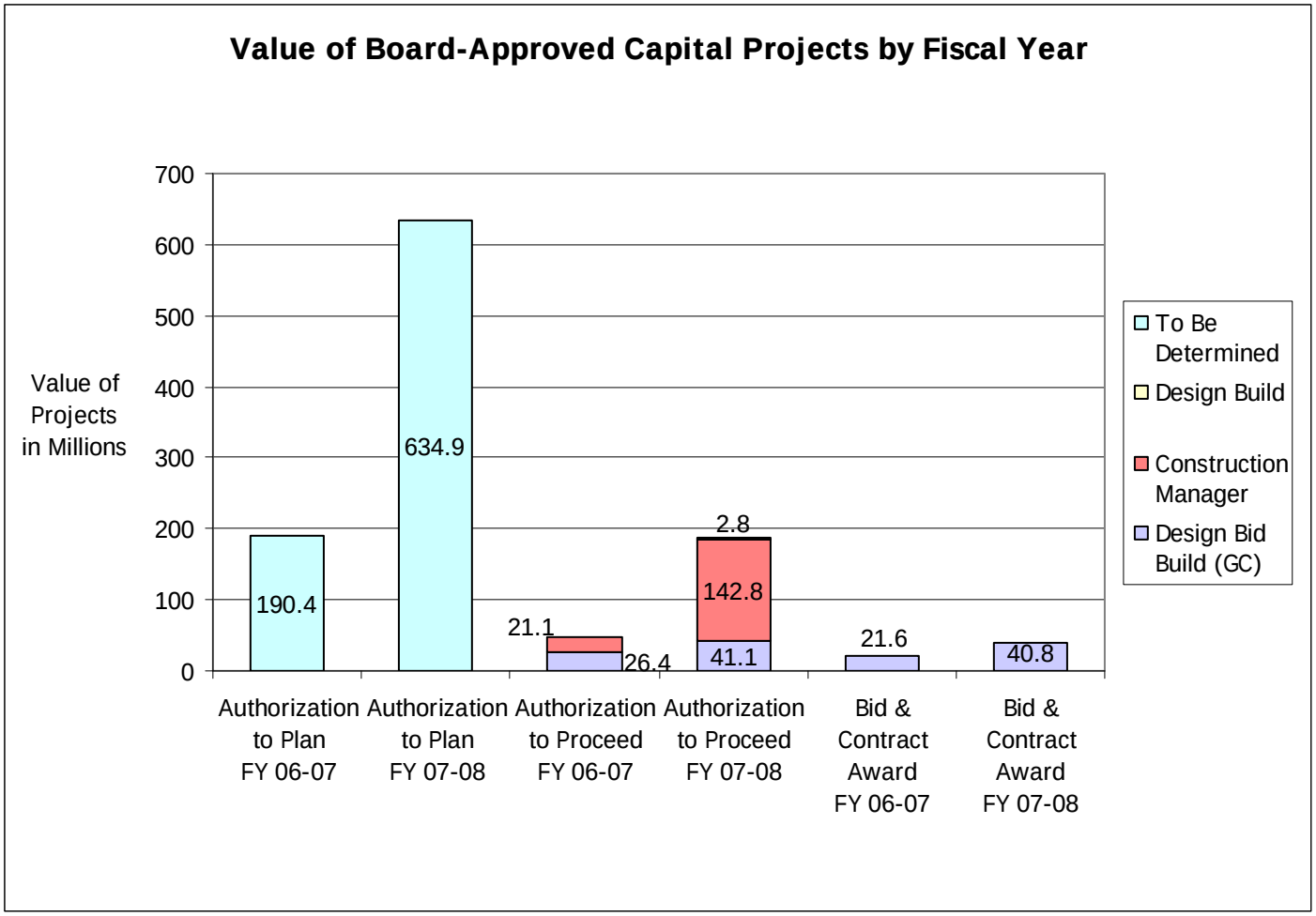


Figure 2A. *Value of Capital Projects Submitted for Board of Trustee action. This figure includes the Facility for Rare Isotope Beams (FRIB) project. It is not yet determined at Authorization to Plan if a project will be delivered as Design Build, Construction Management, or Design Bid Build.*

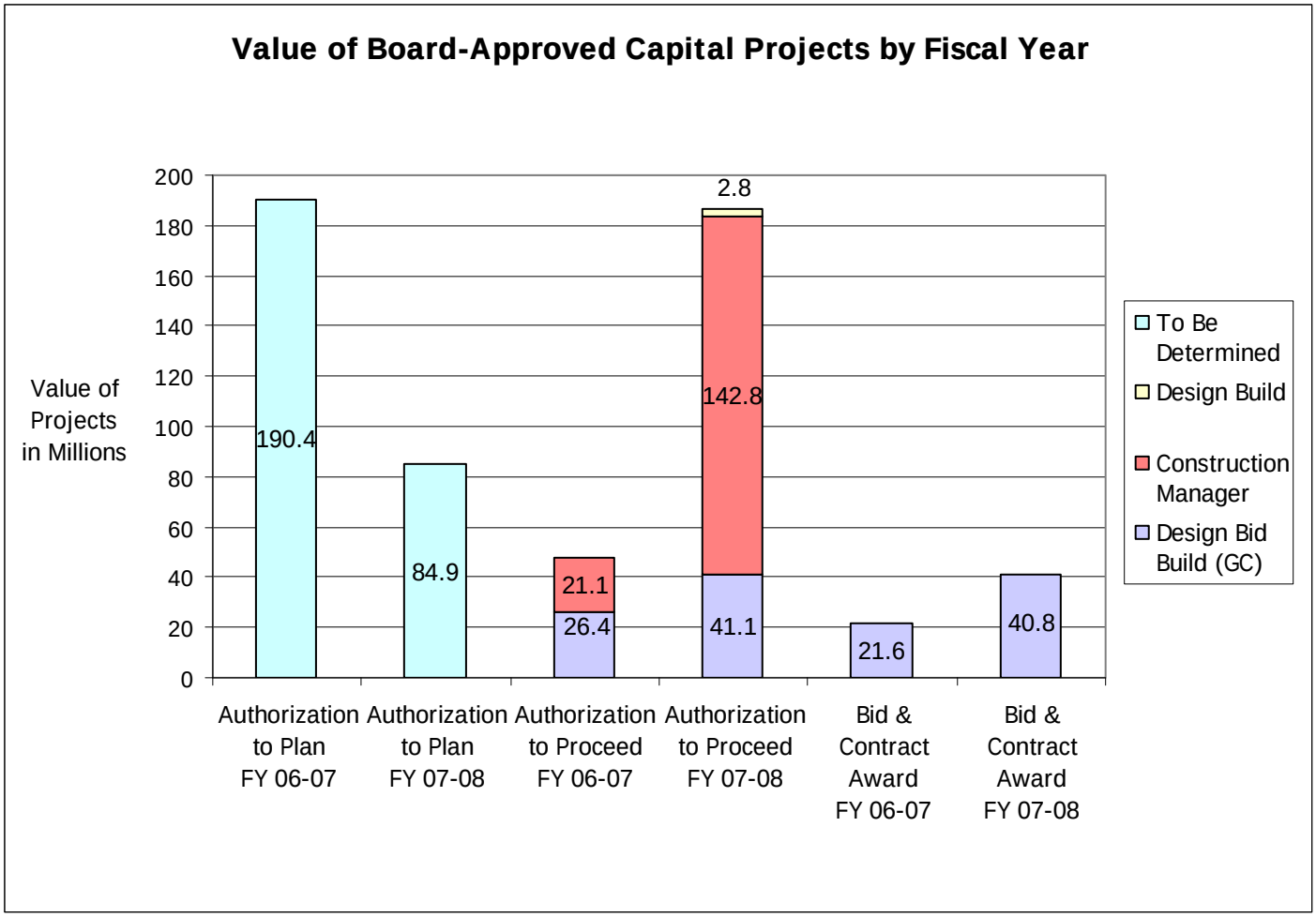


Figure 2B. *Value of Capital Projects Submitted for Board of Trustee action. This figure excludes the Facility for Rare Isotope Beams (FRIB) project. It is not yet determined at Authorization to Plan if a project will be delivered as Design Build, Construction Management, or Design Bid Build.*

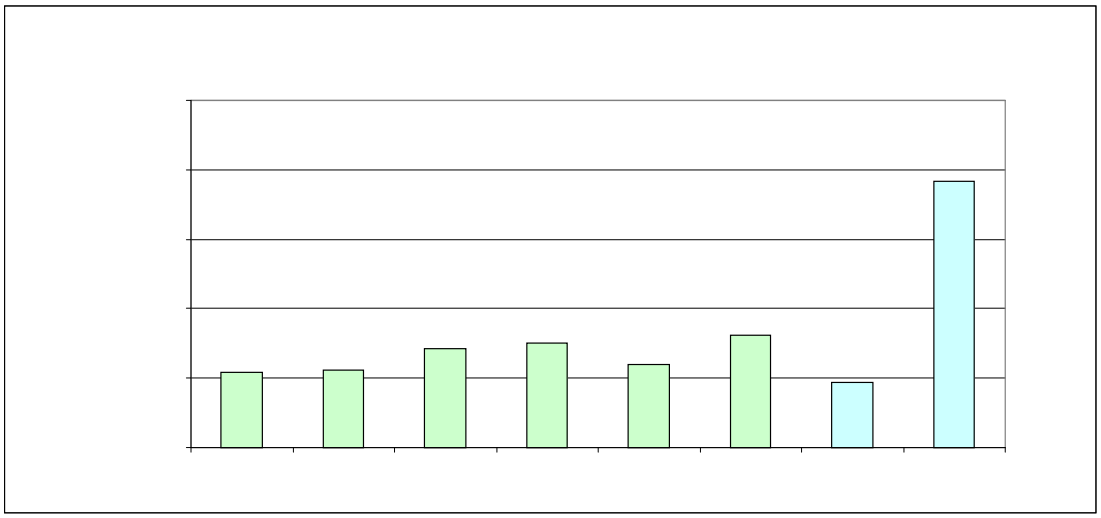


Figure 3. *History of Approved Capital Projects by fiscal year. Note the Board approval process changed in April 2006, increasing the threshold to $1,000,000.*

Prior to April 2006, projects were counted either at contract award or appointment of the construction manager. Since then, projects are counted at Bid/Contract Award for design-bid-build projects or

Authorizations to Proceed for construction management or design build projects. Amounts are based on project budgets, not contract amounts.

Construction and Design Volume

In FY 2007-08, total payments to contractors were approximately $90 million, a decrease from 2006-07, but consistent with FY 2004-05 and 2005-06.

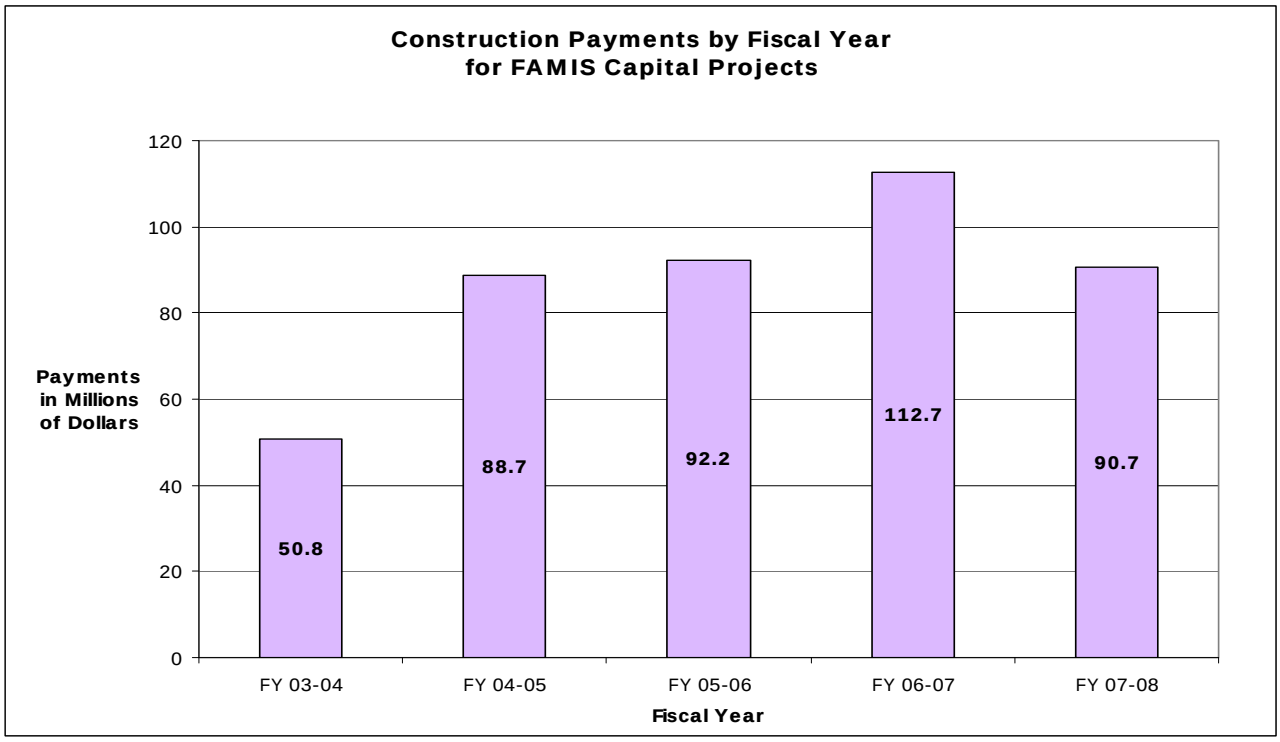


Figure 4. *Construction Payments by Fiscal Year.*

It should be noted that 4 projects accounted for nearly $50 million in payments: The MSU share of the Farm Lane Underpass Project, the Duffy Daugherty Football Building - Addition, Snyder Phillips Hall Renovation, and Chemistry - Office Addition and Renovations.

Design payments increased by 74% in the past year. Most of these payments were made for the Secchia Center, Brody Hall Renovations, Duffy Daugherty Football Building - Addition, the MSU Surplus & Recycling Center, the Wharton Center for Performing Arts - Additions, and Holden Hall - Public Area Renovations, and various Just-In-Time (JIT) projects.

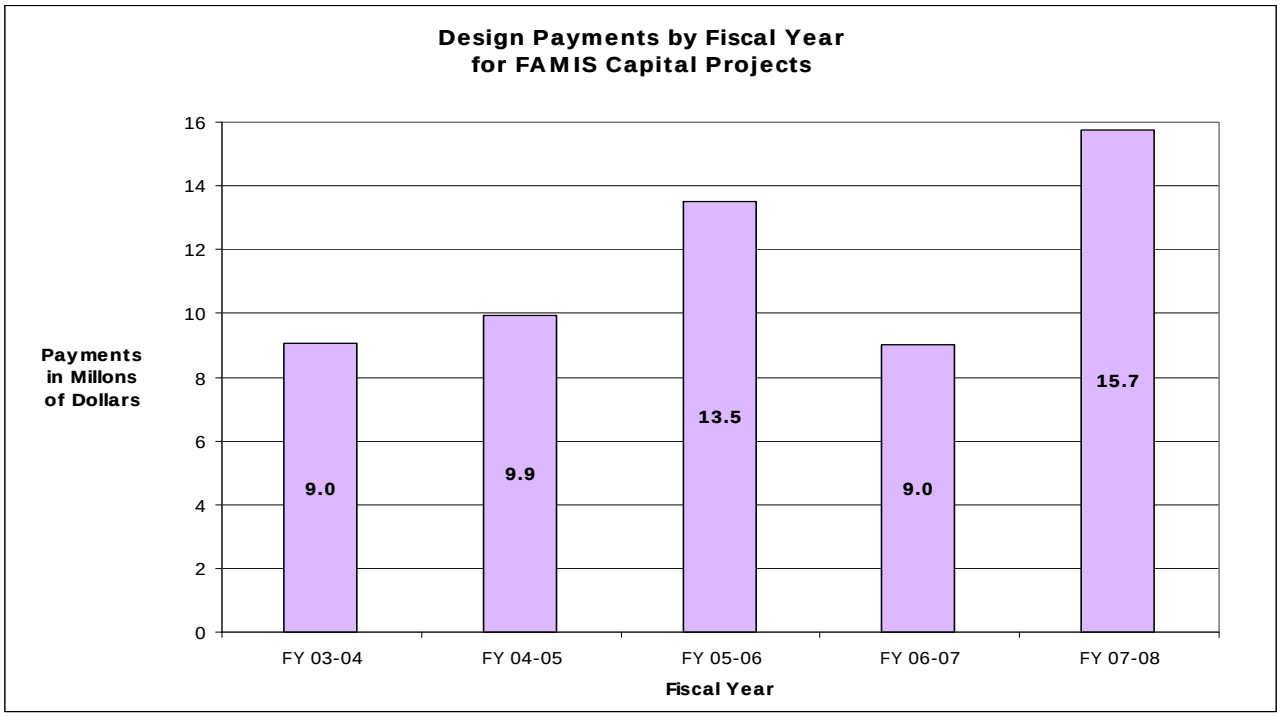


Figure 5. *Design Payments by Fiscal Year.*

The FY 2008-09 construction payments should increase as work continues on the Secchia Center, Wharton Center for Performing Arts - Additions, the MSU Surplus & Recycling Center, and Mary Mayo Hall Renovation, and commences on Brody Hall Renovation, T.B. Simon Power Plant - Coal Handing Modifications, and selected JIT projects. Design activity should also remain relatively high in the coming year, with design commencing on the Morrill Hall replacement, the Plant Science Addition, the Life Sciences Addition, and other programmatic projects. The current economic uncertainty will force reduction of JIT funding by $44 million. Furthermore, as competition for funds increase there may be fewer resources available for discretionary projects, which could negatively impacting design and construction volume.

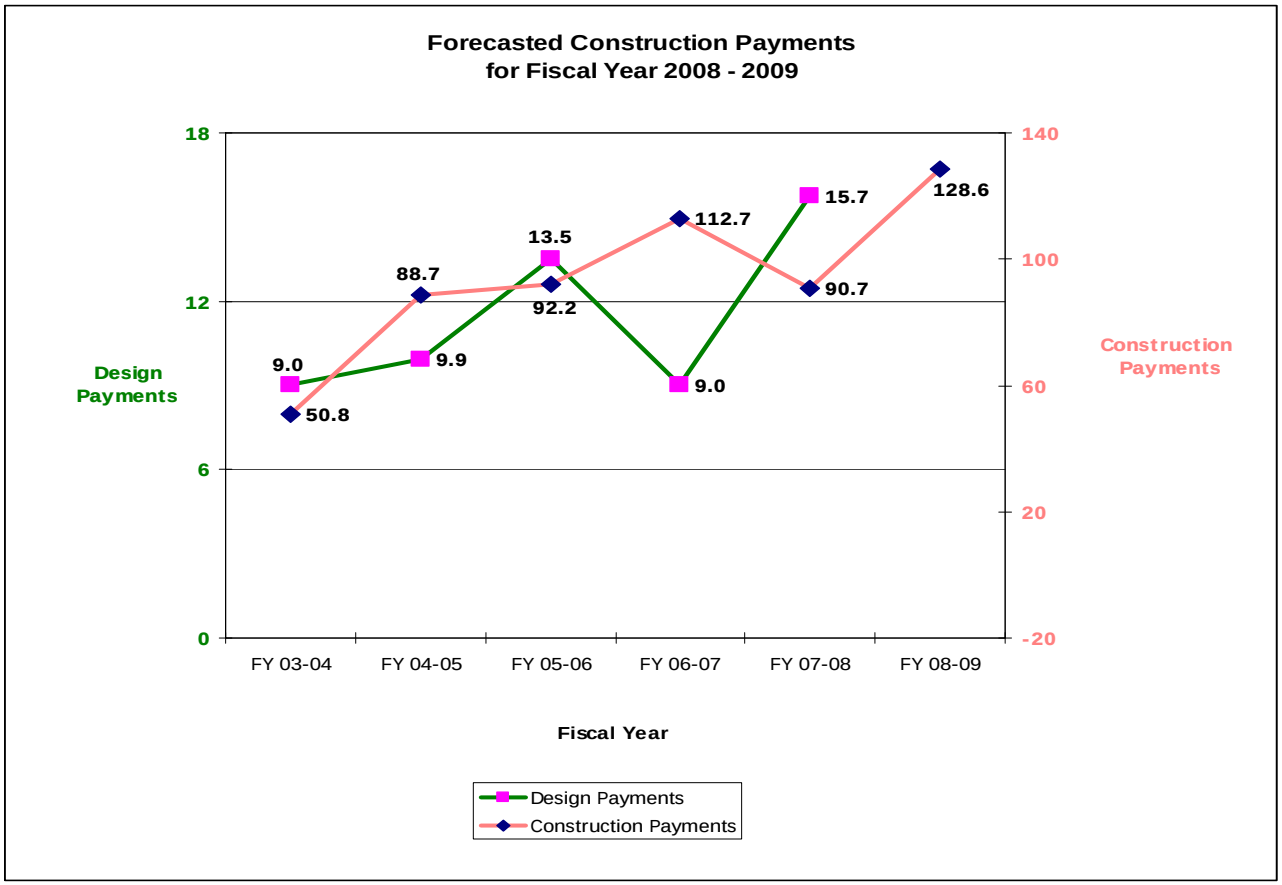


Figure 6. *Predicted Construction Payments for Fiscal Year 2008-2009.*
Construction payments are scaled along the right hand axis. Design Payments are scaled along the left axis. This chart shows that design payments are a leading indicator of construction activity. Construction payments for 2008-09 are projected based payments for July-October 2008.

Construction Change Orders, Particularly Document Changes

As Campus Planning and Administration (CPA) and Engineering and Architectural Services (EAS) strive to make improvements, one of the earliest focus areas has been reducing the number of construction change orders, which consumed more than 40% of contingency for projects closed in FY 2007-08. Change orders are a reality in the construction process for a number of reasons - undocumented field conditions, such as bad soils and concealed asbestos; document discrepancies, where the work specified either cannot be built or does not meet the intent of the project; and scope changes requiring additional work at the discretion of the University.

Though often necessary, changes can lead to delays in construction and disputes with contractors. Often these disputes are not from a single change, but numerous small changes which can lead to a contractor claiming that the volume of changes delayed the project or impacted their productivity, in turn leading to a demand for substantial additional compensation. These concerns have prompted MSU to track change order rates by calculating the dollar value of change orders divided by construction payments (Figure 7). Scope changes modify the function or capacity of a facility, and may include changes to the quality of finishes and furnishings, or change the size of the building or program to be included in the project. These are the most easily controlled source of change, and are discouraged. Initial efforts were good, with overall changes dropping significantly in 2005, and scope changes dropping in 2006. After a sharp increase in FY 06-07, document changes decreased in FY 07-08, but are still higher than the goal of 6%.

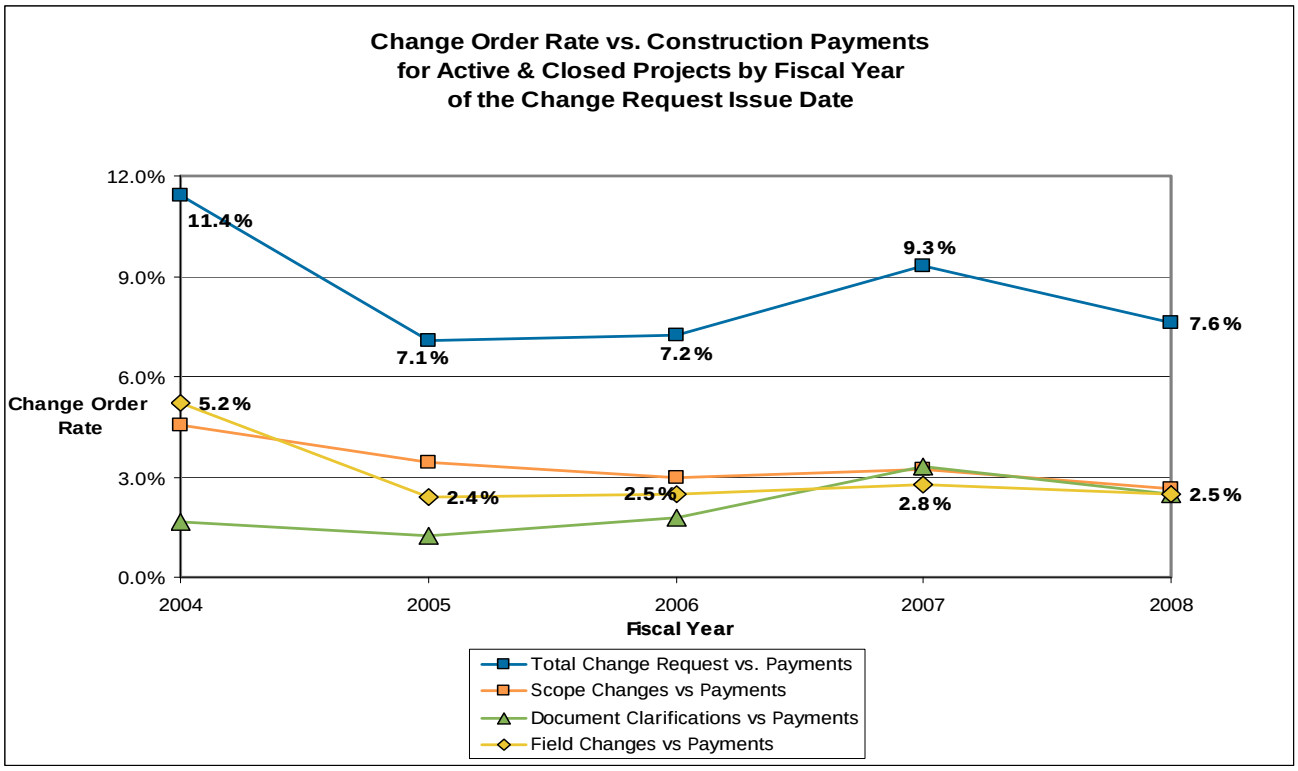


Figure 7. *Change Order Rate vs. Construction Payments for Active and Closed Projects by fiscal year.*

Other factors are being reviewed that may be better indicators of change order performance, such as the categories of construction or the work discipline (roads, mechanical, utilities, etc). Projects closed in the past three years have been categorized as New Construction (complete new building, road, or parking lot), Renovations (reconstruction or reworking of existing space), or Additions (new space added to an existing facility), and by the work discipline, including Roads and Parking, Mechanical and Electrical Equipment Replacement, Elevators, Roofs and Building Envelope, Steam and Underground Utilities, Site, and Program Space (which includes classrooms, offices, laboratories, and clinical space).

Renovations had the highest occurrence of change orders at 10% of construction contract. Additions were comparable, with an 8.9% change order rate. New Construction projects only experienced change orders of 1.4% of construction contract. This is to be expected, since renovation work has the most unknown information, particularly in occupied buildings where investigation behind walls and above ceilings may not be possible. The work disciplines that had the greatest change order rates were Mechanical and Electrical Equipment, Roads and Parking Lots, and Roofs and Building Envelope. Roads, lots, roofs, and building envelopes all have hidden conditions inherent in the work. The existing conditions can be assessed only after removing the existing veneer. Mechanical and Electrical equipment replacement projects are difficult to design to ensure they meet operational requirements in the limited space available. This leads to more changes both for field conditions and for design clarifications. This data will be further analyzed in the future, particularly for variations among scope, field, and document changes.

Table 1. *Change Orders by Construction Type*

Value of Change Orders by Type of Construction	FY 2005-06 through 2007-08		
	Change Order	Contract	% of Contract
New Construction:	13,869	959,438	1.4%
Renovation:	9,244,484	92,099,628	10.0%
Addition:	465,524	5,217,964	8.9%
Total:	**9,723,878**	**98,277,030**	**9.89%**

Table 2. *Change Orders by Discipline*

Value of Change Orders by Discipline	FY 2005-06 through 2007-08		
	Change Order	Contract	% of Contract
Roads & Parking Lots	2,295,662	21,845,230	10.5%
Mechanical & Electrical Equipment	2,697,118	22,652,845	11.9%
Elevators	209,631	5,844,326	3.6%
Roofs & Building Envelope	1,645,399	14,159,185	11.6%
Steam & Underground Utilities	346,750	5,593,496	6.2%
Program Space	1,759,278	20,030,064	8.8%
Site	770,040	8,151,884	9.4%
Total:	**9,723,878**	**98,277,030**	**9.89%**

It is possible that the apparent lack of progress on construction change orders is caused, at least in part, by a shift in the mix of construction at MSU. More than 90% of the construction in this sample was renovation, with only 1% new construction. This is consistent with the Vision 2020 Master Plan principle to reuse existing facilities whenever possible. These disciplines are typically Just-In-Time work, which has also been emphasized in the past five years. It should be noted that construction in FY 2008-09 will have more new construction, including the MSU Surplus & Recycling Center and the Secchia Center, and JIT funding will likely be reduced in future years. If these trends continue, change order rates should decrease simply because of the change in the portfolio of construction.

Physical Plant EAS continues to make adjustments to improve document quality. In 2004, the School of Planning Design and Construction submitted a set of recommendations for change order process, of these 33 recommendations, 29 have been or will be implemented (*Appendix B*). Some recommendations were rejected after reviewing the potential impact to customers and contractors. Additionally, some recommendations conflicted with MSU's construction goals. For example, the report recommended that pre-construction contingencies be reduced. After review, customers preferred budget certainty with the potential for funds to be returned rather then project increases as a result of change orders coming from unknown factors. Accordingly, the recommendation was not implemented.

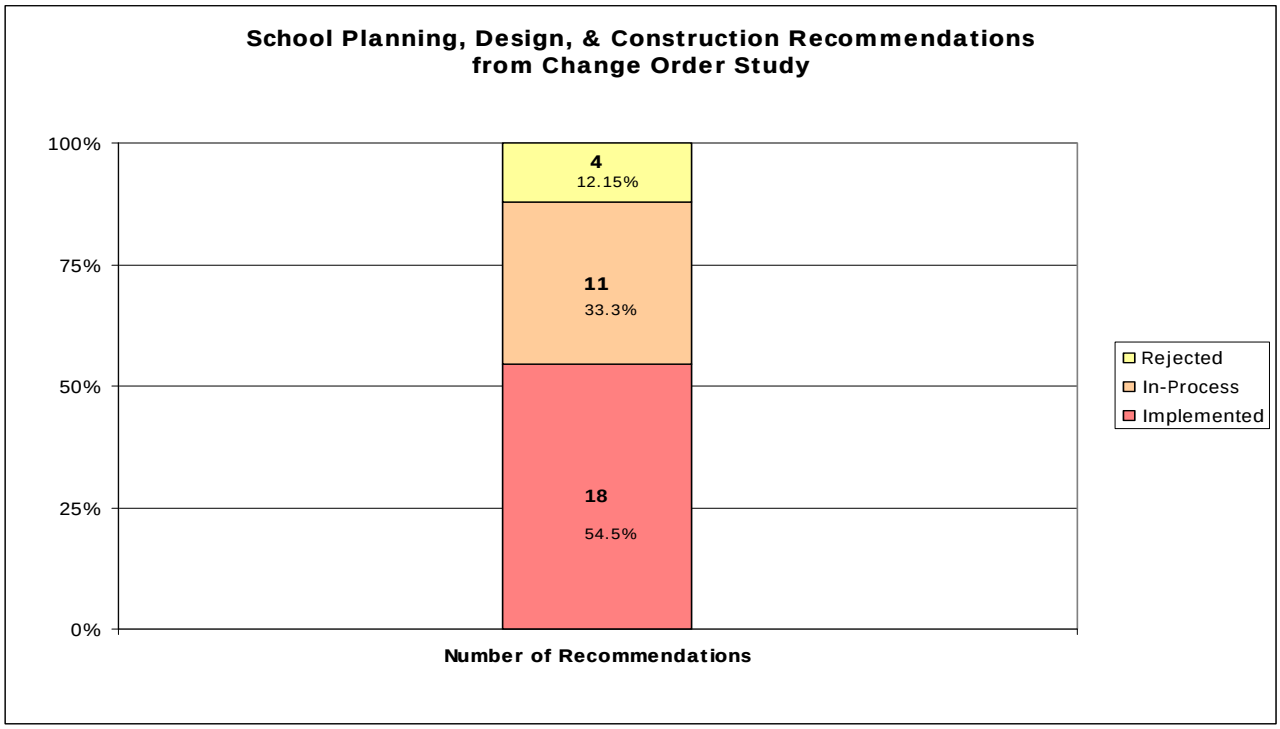


Figure 8. *School of Planning, Design, & Construction Recommendations for Change Order Study.*

The Physical Plant skilled trade staff is available for field investigation of existing buildings. This allows designers to explore hidden areas during design, and minimize unknown conditions discovered after construction begins. From January 2007 through October 2008, EAS staff submitted more than 1,700 plan review comments on 169 projects bid for construction. The plan review process will be further developed in the Skire Unifier Project Management software.

Since projects typically last for more than one and often more than three years, it is difficult to measure the results of process changes within short periods. Projects and processes will continue to be evaluated for opportunities for improvements.

Timely Project Completion

Substantial Completion requires that a project is usable for its intended purpose (e.g., a road intersection is open, classes or research can be conducted in a laboratory, or an elevator is permitted to carry passengers). MSU has made progress in project completion. Figure 9 shows that 39 of 45 projects (89%) met substantial completion on time or ahead of schedule versus 80.8% and 86.7% in FY05-06 and FY06-07, respectively. Consequently, the percentage of projects which missed substantial completion has declined from 19.2% in FY 05-06 to 11.3% in FY07-08. The percentage of late projects have declined as the number of projects has increased, indicating that the construction team is doing a better job in meeting substantial completion.

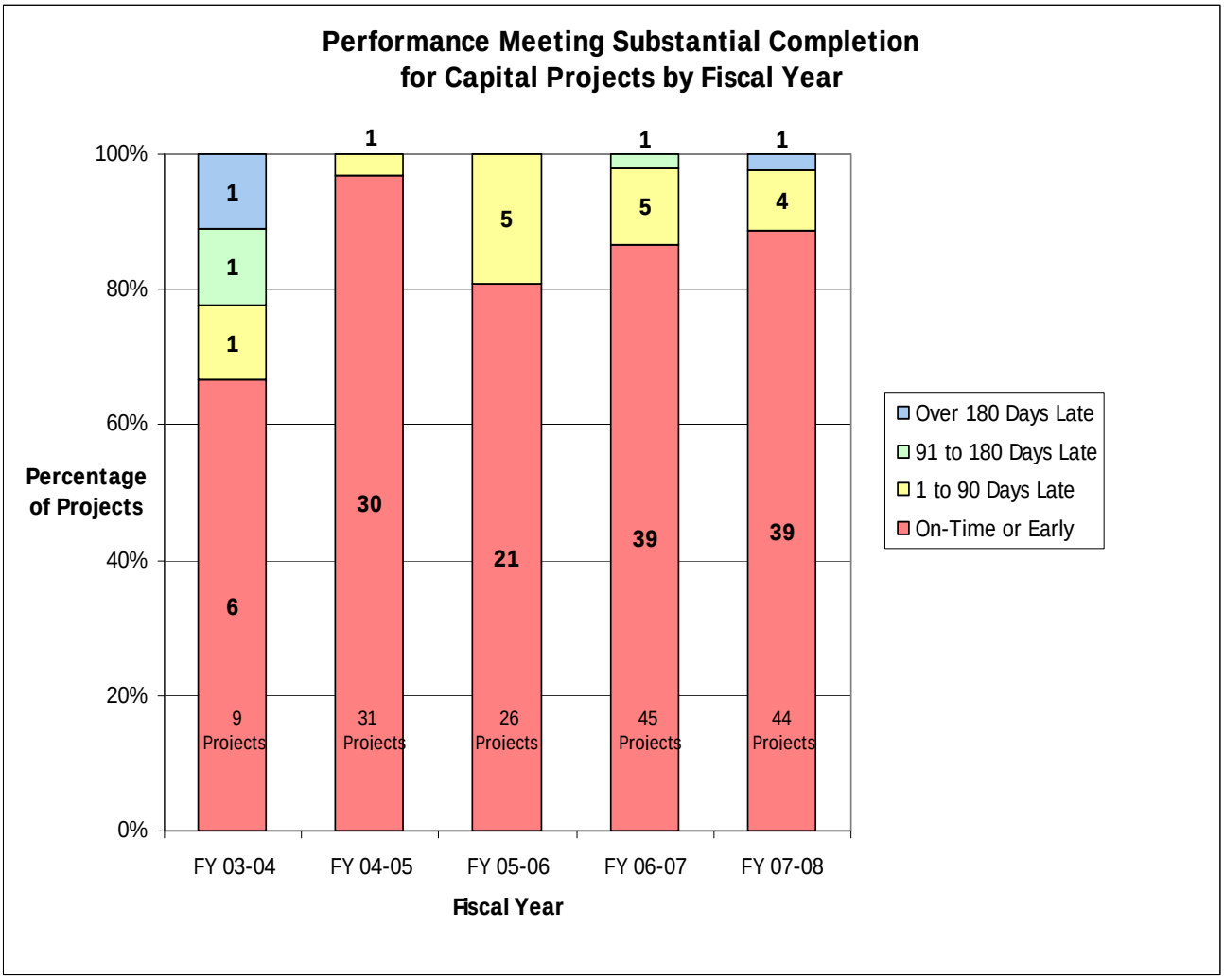


Figure 9. *Performance Meeting Substantial Completion for Capital Projects.*

In the data represented above, projects that did not meet substantial completion on schedule did not impact vital university functions, such as classrooms and laboratories being unavailable for teaching or residence halls not open for move-in. MSU emphasizes schedule requirements by setting realistic substantial completion dates with MSU clients, specifying those requirements clearly in the bid documents, and then holding contractors to a high standard of compliance. EAS is using a more demanding scheduling specification for most large projects, and has emphasized schedules at contractor and consultant forums.

Final Completion requires that all activities for a project be finished, including the contractor's punch list of corrective items and work performed by MSU forces for tasks such as landscaping, installation of telecommunications and data networks, and instructional media, and procurement of furnishings and equipment. It also requires that all expenses are complete and unused funds are returned. Only 32% of the 37 projects that were closed during fiscal year 2007-08 met final completion on schedule, a modest improvement from last year (29%). Figure 10 shows progress over the past 3 fiscal years, though there is still room for improvement.

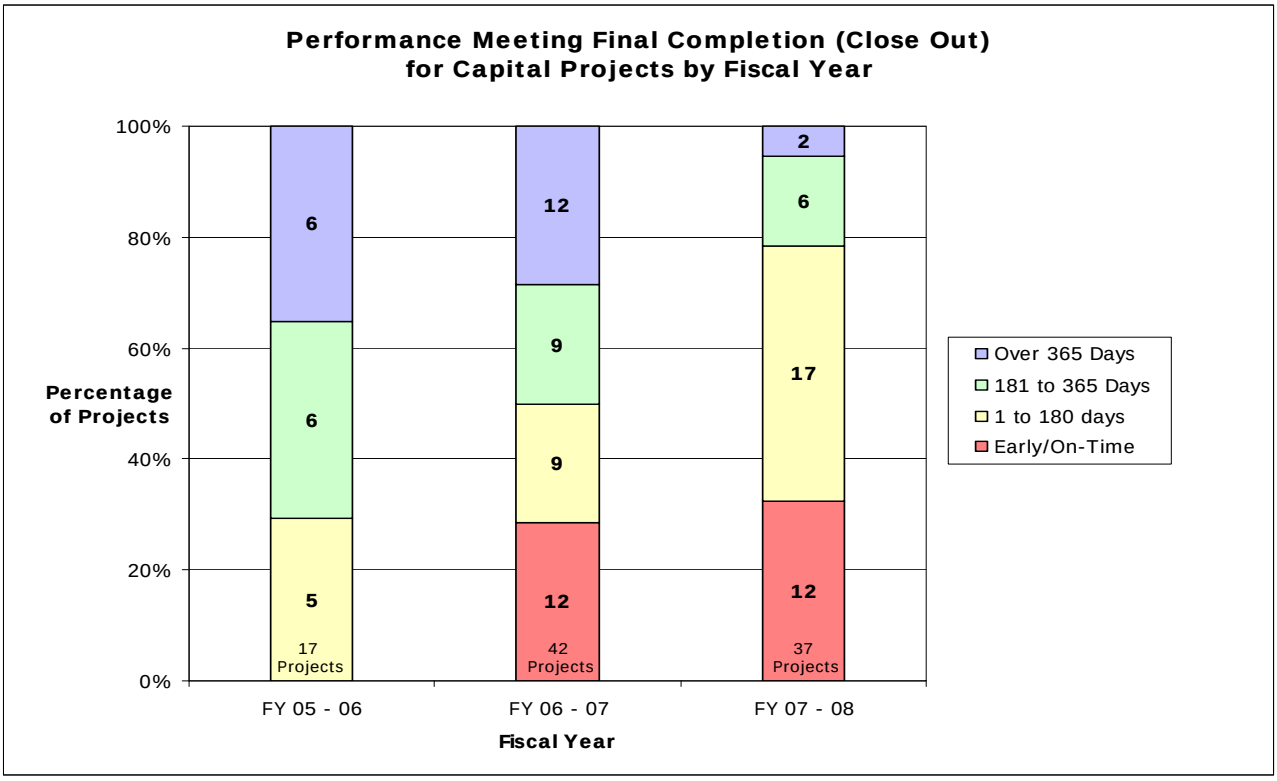


Figure 10. *Performance Meeting Final Completion (close-out) for Capital Projects.*

There are a number of factors that inhibit timely final completion. The University self-performs many functions on a construction project, including landscaping, procurement of furnishings and equipment, computer and telecommunication networking, and the selection and installation of public art. These functions tend to occur toward the end of the project. Many projects have not had realistic schedules for accomplishing these activities. Reviewing the poorest performing projects for FY 2007-08, it appears that the primary causes for slow closeout were either late customer requests for additional work, or lingering work by owner that took longer to resolve than expected.

In order to be successful in timely project completion, self-performed work must be better integrated into the schedule. In response to this issue, the University is putting more effort into setting and maintaining schedule information throughout the project, all the way to final completion. Schedules are assembled in consideration of MSU activities. Rather than waiting for the completion of all field activities, staff are closing portions of the work as it is complete. CPA and EAS meet regularly to review the status of projects that are substantially complete. EAS is updating the university construction specifications to require that contractors dedicate a percentage of their price to close-out activities.

In April 2008, the School of Planning Design and Construction (SPDC) completed a study to evaluate the project close-out process. Timelier project close-out would be a benefit to all project stakeholders, including the MSU user, the project implementation team, contractors, and designers. One recommendation is to track project closeout in two segments; from substantial completion to final payment to the contractor (T1), and from final payment to final closeout of the project (T2). Figure 11 displays the average durations for these times, along with total closeout duration for the past three fiscal years.

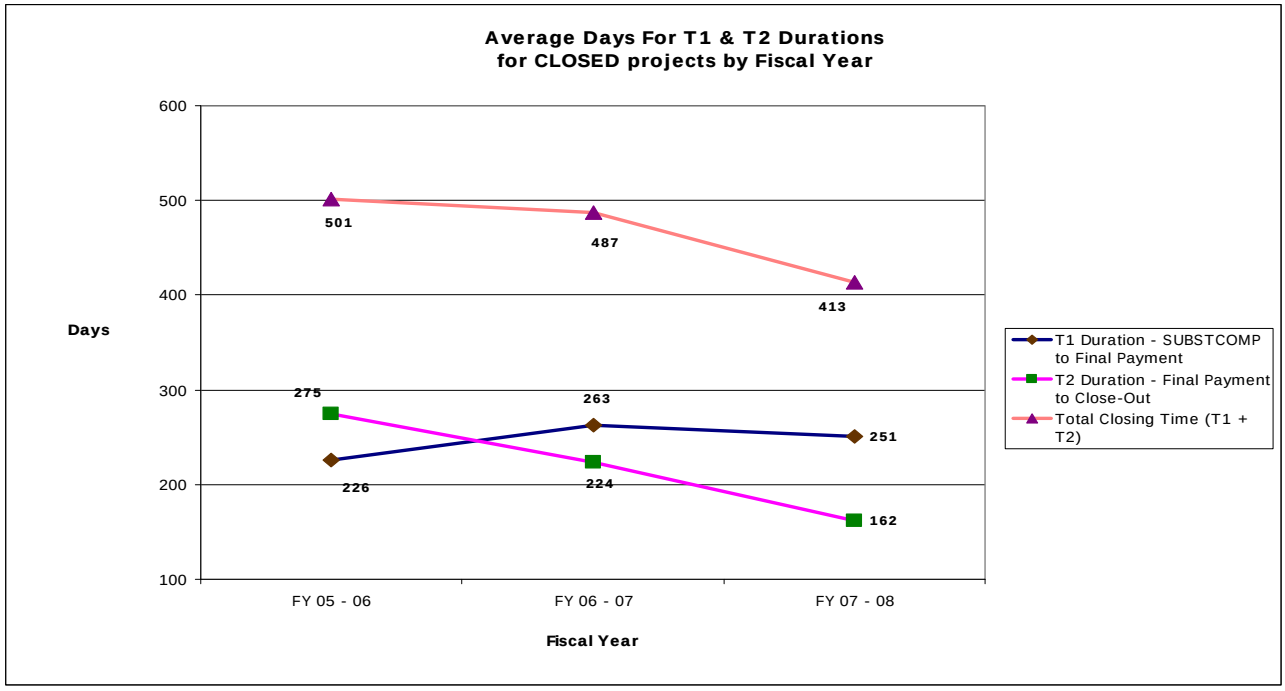


Figure 11. *Average days for T1 and T2 Durations for Closed projects by Fiscal Year.*

Overall closeout time continues to decline, though there is clearly opportunity for more improvement. T2 time has dropped significantly in the past 3 years, and we believe this is a product of better planning for owner-performed work, and closer review of project budgets and status as construction proceeds.

Skire Unifier™ (Project Management Software)

Because our projects are very complicated, and the expectations for project management are high, these endeavors are now balanced against a spectrum of needs. After reviewing alternatives, the University has decided to implement project management software. The purpose of this software is to enable MSU to standardize business processes and improve collaboration, information sharing, and overall construction performance.

After reviewing available options, the University selected Skire Unifier™, an integrated web application which will be used by MSU staff, contractors, and design professionals. Implementation is proceeding; major construction business processes are currently in place, and projects released for bid on or after November 1, 2008 are using Skire to process payments, change orders, and budget approvals. Physical plant and CPA are striving to have all estimates created in Skire by spring, 2009.

Skire Unifier™ was selected in part because it is a highly configurable system that allows MSU to create processes tailored to our operations. To fully benefit from a project management system, the University must review how it conducts business, and be willing to change its model when appropriate. To this end, the implementation team has identified to date 74 business functions that could be improved or better defined, and more will certainly be added.

Quality Control (Contractor, Owner, and Designer Feedback)

The University has established a scorecard for general contractors and construction managers for use as a feedback tool. In general, contractors view MSU as a preferred customer and want to meet our expectations. The scorecard is a tool for making contractors and construction managers aware of

opportunities for improvement in their work performance. It may also become a resource when considering contractors. As part of project close-out for major capital projects, the construction representative or project manager evaluates contractor performance through a standardized score card to rate each project and vendor. Appendix B ranks project scores for work completed (final payment made to the contractor) in the fiscal year.

It is the Construction Representative who shares the scorecard with the contractor, along with average scores. The Construction Superintendent reviews poor performance with contractors who have had multiple mediocre or unacceptable projects.

Figure 12 shows contractor scores to date for fiscal year 2007-08, as compared to our goal of score or at least 80%. While contractors are scoring relatively well on cost, project management, and close-out, they are somewhat less successful meeting our expectations on schedule and quality.

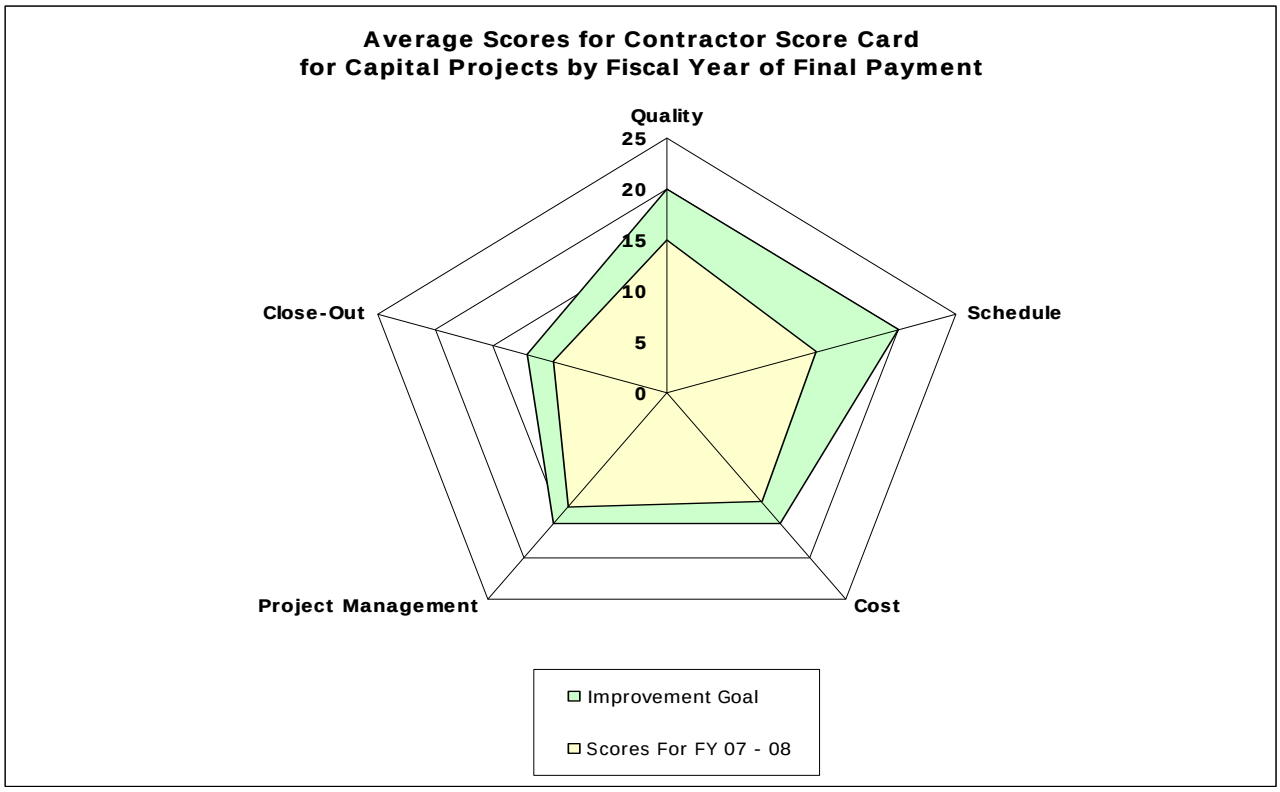


Figure 12. *Average Contractor Score for Capital Projects after Final Payment.*

Note: Not all factors have equal weight. The green area (*Improvement Goal)* is the target for good performance.

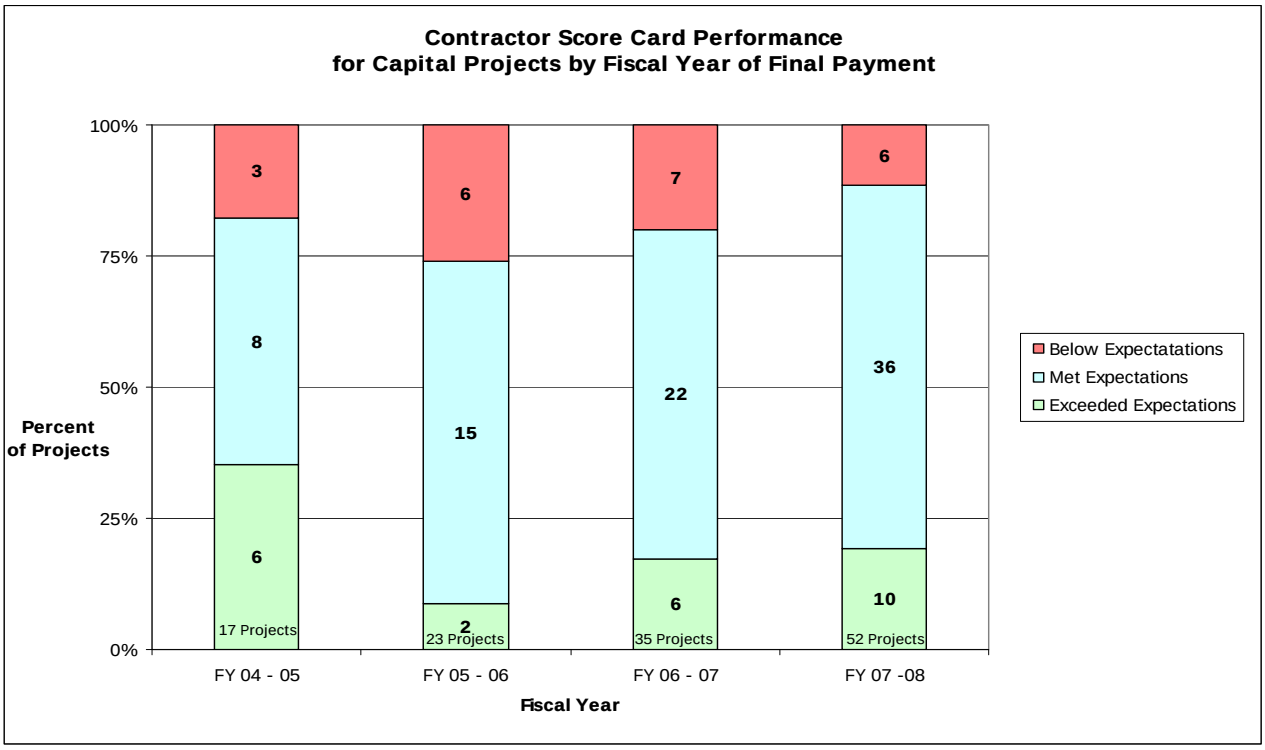


Figure 13. *Contractor Score Card Performance for Capital Projects.*

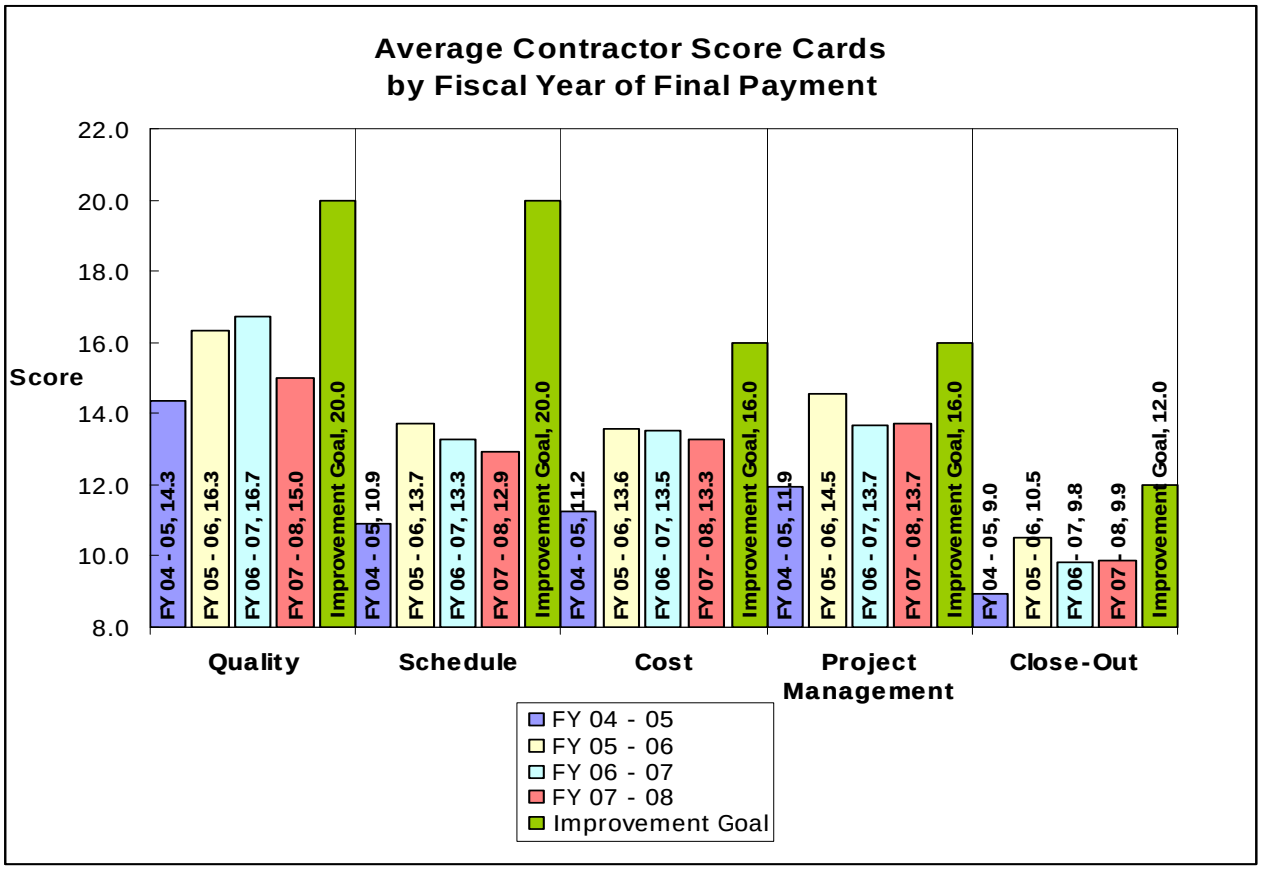


Figure 14. *Average Contractor Score Card by Fiscal Year.*

Michigan State University strives to be an owner of choice for contractors, and that includes continuing to improve our practices and processes to accentuate value. To that end, contractors are asked to complete a scorecard on University performance. Figure 14 shows contractor scores to date

by fiscal year, compared to the goal of scoring 100%. Although contractors perceive the close-out process as a challenge, it is encouraging that they continue to see MSU as a preferred customer.

The Design Professional Scorecard has been created and its results will be reported in next year's facilities and infrastructure report. Physical Plant EAS is also creating a customer scorecard to collect information from MSU departments. The School of Planning Design and Construction will also assist in improving the vendor feedback process.

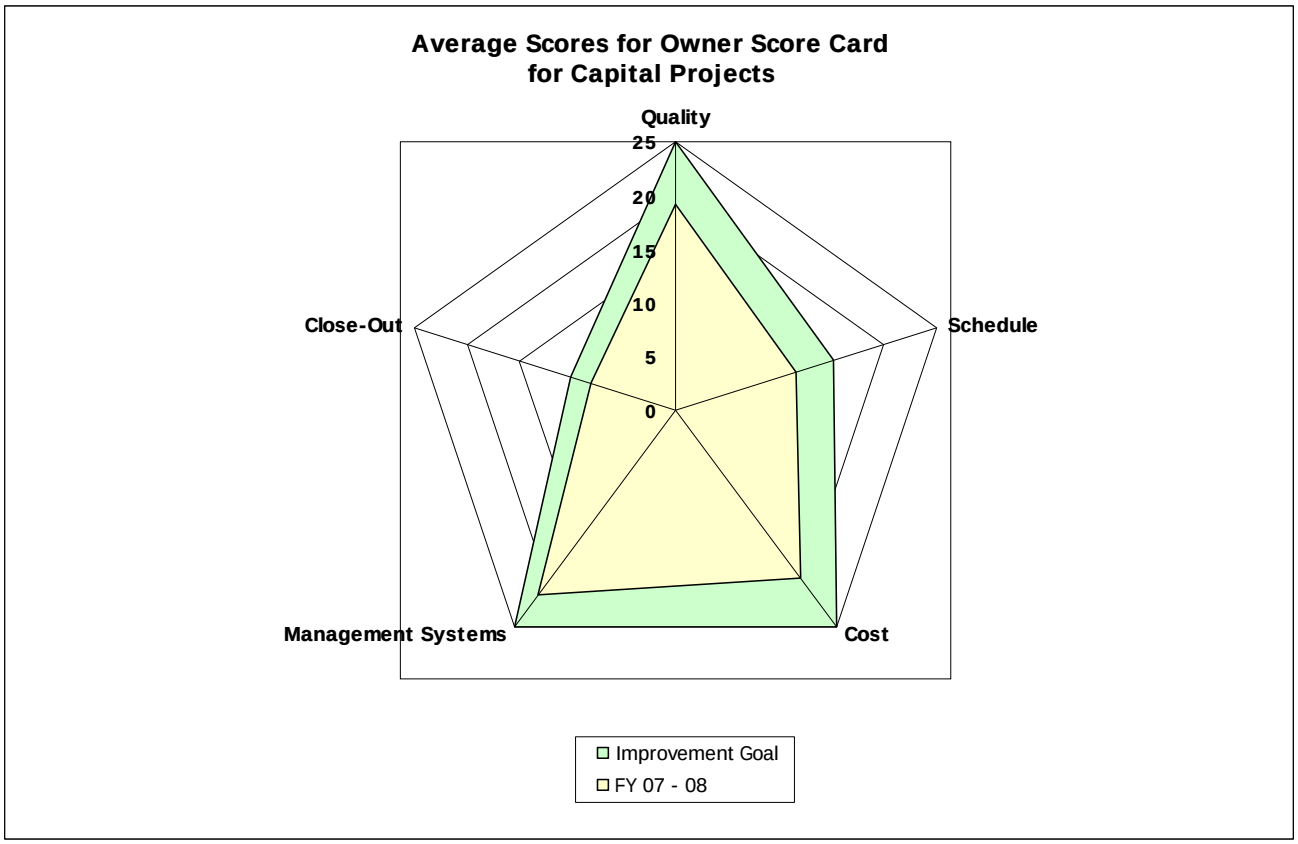


Figure 15. *Average Scores for Owner (MSU) Score for Capital Projects.*

Not all factors have equal weight. The green area represents the Improvement Goal.

Future Directions

Post Occupancy Evaluation

To date, most of the collected data focuses on objective criteria related to design and construction, particularly cost and schedule. It is time to expand our feedback resources to include information about customer satisfaction and perceptions, building performance, and accomplishment of stated design goals. MSU is organizing a formal Post Occupancy Evaluation (POE) program, which will measure these factors, and create a feedback loop to immediately address project problems, as well as a "lessons learned" catalog of experience for similar future work. It is hoped that this will upgrade the design and construction process, and create a stronger connection between delivering facilities and MSU's success in providing education, conducting research, and advancing outreach.

Environmental Stewardship

Summary

In 2006, an Environmental Systems team made of faculty, staff and students from many disciplines came together to research methods to improve environmental stewardship on campus. In January 2008, the systems team announced 26 recommendations in 6 focus areas – systems management, energy reduction, material reduction, purchasing, behavior & culture change, and communication - to reduce MSU's environmental footprint.

Since January 2008, tremendous progress has been made in implementing all 26 of the recommendations. Subsequently, additional research and pilot studies were conducted to identify the next set of focus areas for campus. Twenty-four (24) new recommendations address long-term planning, additional reduction strategies and new technologies. The centerpiece of the new recommendations is the establishment of long-term campus stewardship goals – 15% reduction in greenhouse gasses from the power plant, 15% energy (electrical & steam) reduction and 30% landfill waste reduction by 2015. These goals will help MSU make significant environmental changes and keep the university on target with future legislation.

Despite the momentum and success in environmental stewardship, challenges remain. Campus growth adds more energy load to the power plant, future resources to implement changes are not yet identified, and planning beyond 2015 is contingent on a variety of factors that are uncertain. The systems team has been taking steps to address each of these challenges and prepare for an environmentally sustainable future for MSU.

Analysis

The six focus areas from the January 2008 recommendations – systems management, energy reduction, material reduction, purchasing, behavior & culture change, and communications – are in the implementation phase. The initiatives have touched several areas on campus and have been successful. The following analysis describes the progress in the six named focus areas.

Systems Management

The Geographic Information Systems (GIS) office creates spatial information databases. The office created an environmental stewardship map portal as a method of organizing waste and energy data. From the GIS website, www.gis.msu.edu, anyone can see how much energy was used, how much waste was land filled, and how much materials for recycling were collected in campus buildings from month to month. In addition, the site creates building reports that give a snapshot of waste and energy reduction. The building reports relate energy and waste data to MSU's goals of 15% reduction in energy (electrical and steam), 15% reduction in greenhouse gases, and 30% reduction in waste by 2015.

A considerable challenge in creating the data management tool was the source of data itself, as energy and waste data is complied per building, thus, departmental data is not available. Technology improvements are continuously happening, yet it is difficult at this time to parse out the impact of a section of a building. Although one particular department may not be the single source of a building's results, it is important for every department to be part of the solution.

Electrical metering has been a primary focus of implementing an effective environmental information management system. The adage, 'you can't manage what you can't measure' is especially true for energy consumption. Energy data collection and reporting back to campus is critical to behavior change according to the Environmental Stewardship Behavior Group studies. A 3-year electrical meter upgrade project was funded to provide real time feedback to building occupants on electrical energy use. The smart meters provide additional information for analysis on an hour by hour, or minute by minute basis for each building. To date 20 buildings have real time electrical energy meters installed and they can be viewed on the web at www.meters.msu.edu. Smart meters give help the physical plant identify, in real time, issues such as malfunctioning equipment, which results in poor energy performance. With no smart meter, the HVAC management staff must wait 30 days for a meter reading to identify HVAC performance issues. There are over 100 additional buildings in which the smart electrical meters are to be installed, which will allow students, faculty and staff to view their consumption in a building with a click of the mouse. This type of feedback is important to energy conservation behavior change and creating a culture of environmental stewardship on campus.

Energy Reduction Strategies

A suite of energy reduction strategies were implemented including classroom consolidation, heating, ventilating and air conditioning (HVAC) schedule reductions, residence hall initiatives, programming revisions such as variable air volume (VAV) plus, new technologies including indoor air quality sensors, motion and light sensors , continuous commissioning and transportation.

HVAC Schedule Reductions

A 2007 MSU study showed that by reducing HVAC run times by one hour in each building should save 3% of the building's energy. As a result, physical plant began to systematically reduce run times on the air handlers to cumulatively reduce the run times by at least one hour.

Classroom Consolidation

Smarter building utilization was hypothesized to result in lower energy use in campus buildings. Classroom consolidation, moving classes from lower utilized buildings to higher buildings, was one approach to reducing energy consumption. In some buildings, a couple of classes resulted in an entire building staying open and fully heated or cooled into evening hours. Seven buildings were targeted for classroom consolidation pilot - Agriculture Hall, Baker Hall, Giltner Hall, Natural Resources, Old Horticulture, Olds Hall and Urban Planning. Accommodating course needs was a top priority. Classes were moved to proximate buildings and relocated to rooms that could accommodate the size, space and technology requirements. Out of the seven pilot buildings, five showed energy reductions from calendar year 2007 to 2008. See Natural Resources Figure 1 and 2 as an example and Figure 3 for summary.

The combination of the other energy reduction strategies and the environmental stewardship program has resulted in reductions in several additional buildings on campus.

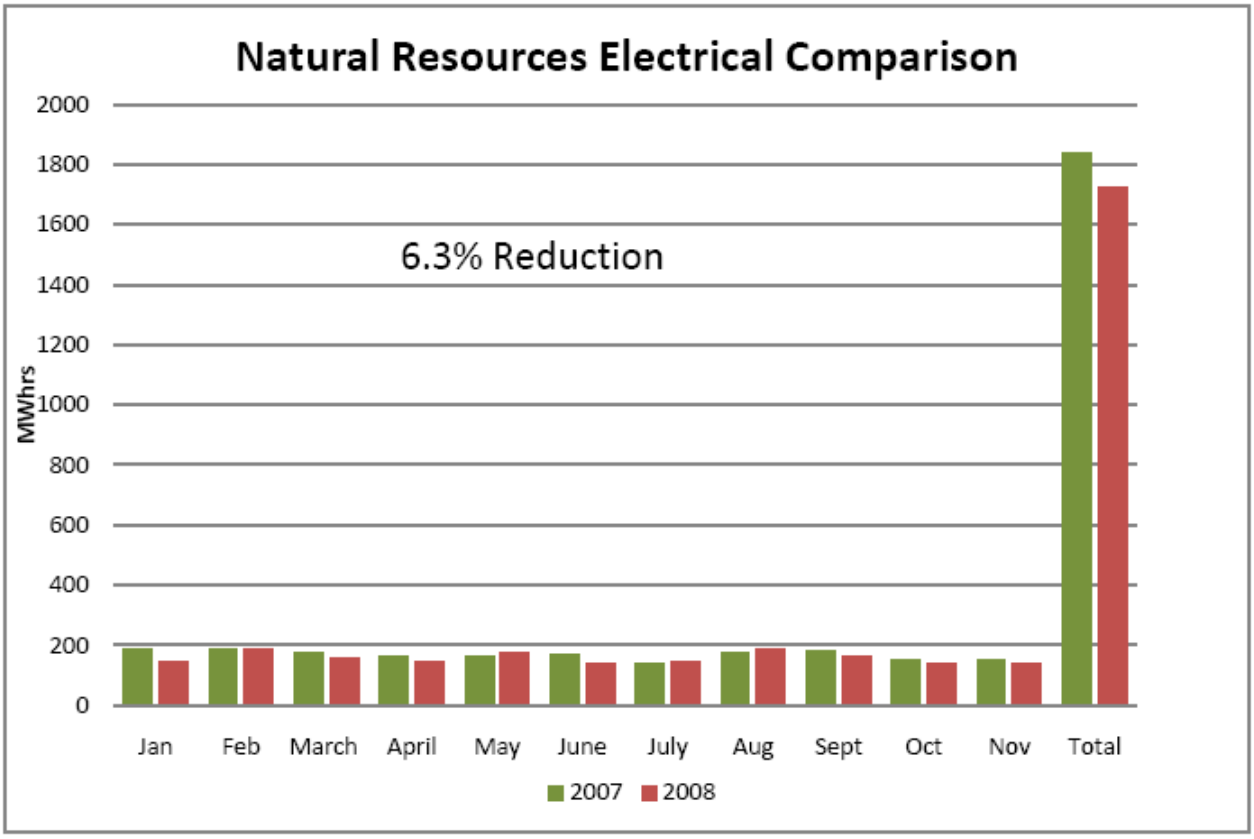


Figure 1. Energy reduction attributed to classroom consolidation in the Natural Resources

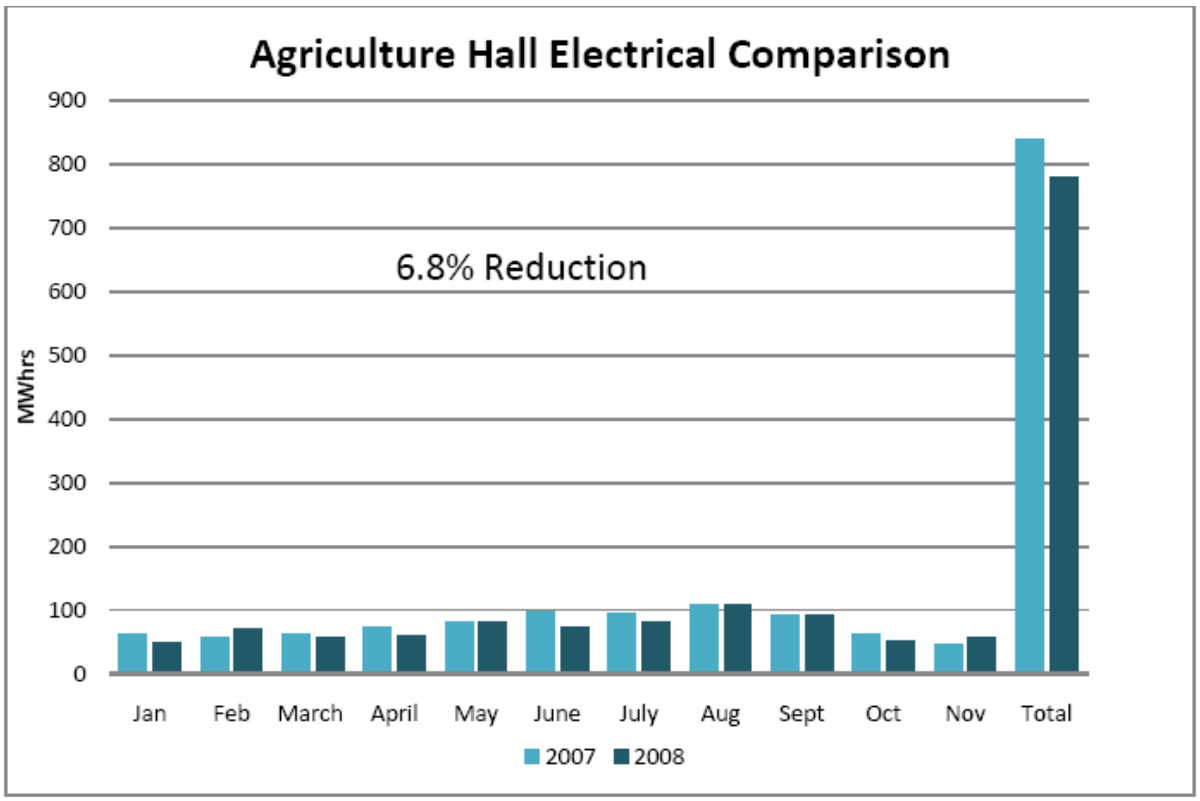


Figure 2. Energy reduction attributed to classroom consolidation in Agriculture Hall

Classroom Consolidation

	MWHRS	$$ at .08 cents/KWhr	Metric Tons CO2
2007	6609	528,720	4295.85
2008	6397.7	511,816	4158.505
Savings	211.3	16,904	137.345

Figure 3. Summary of megawatt hours, dollar and CO2 savings as a result of classroom consolidation.

Housing & Food Service Reductions

The Division of Housing and Food Service (HFS) has made several changes which has led to an average of 6% electrical energy reduction in 18 out of 22 facilities.

The conservation activity in South Complex Halls (Wonders, Case, Wilson and Holden) is a good example of energy reductions throughout the division. Overall, South Complex reduced their energy usage by a combined 27% last year; each hall had a 6 - 8% energy savings and the complex reduced energy consumption 10% in the previous year.

In Wonders and Case Residence Halls, a large amount of the electrical reduction was due to replacing light fixtures with energy efficient fixtures. Ballasts were changed from T12 to T8 fixtures. Eighty percent (80%) of the light fixtures in Wonders were changed, and in Case Hall hundreds of compact fluorescent bulbs were installed.

The primary focus for South Complex reductions was lighting fixtures which operated 24 hours per day and 7 days per week (24/7). If the fixture ran 24/7, it was updated with a more efficient fixture or replaced. In Wonders Hall, scheduling for the Kiva (large air conditioned meeting room) was more stringent. No air conditioning was provided for small groups. South Complex (Wonders, Case, Wilson and Holden Halls) is a very active area with many space use demands.

Energy efficient lighting, HVAC cutbacks and right sizing booking needs has had a tremendous impact in reducing electrical consumption in residence halls.

New Technologies

New technologies such as variable air volume (VAV) plus, indoor air quality sensors, motion and light sensors and continuous commissioning through the building energy management system were implemented in 2008.

Variable Air Volume (VAV) Plus allows MSU to reduce the amount of outdoor air need to heat or cool a building, thus reducing the energy required to heat or cool the outdoor air and the fan energy needed to push the air into the building.

Sensor technologies allow turn off lights and equipment based on occupancy (for motion sensors) or light levels (for light sensors). In a 2007 building study, it was determined that a 6% electrical energy reduction could be achieved by cumulatively achieving an extra hour of “off time” for lights and equipment. Sensors are a technological solution to turning off lights and equipment.

Continuous commissioning uses a centralized computer system to look at all HVAC equipment to continuously collect and analyze data to ensure that the system is running efficiently. Through continuous commissioning, the Physical Plant can quickly ascertain any issues with equipment instead of waiting one month for a meter reading. It helps with real-time decision making to improve building system and energy performance.

Transportation

Transportation has made improvements in changing the composition of University vehicle fleet by purchasing hybrids in the normal course of replacement. This changing profile of the fleet has resulted in reduced CO2 emissions for campus. A detailed analysis of MSU’s transportation fleet can be found in the *Transportation* section in this report

MSU is making progress in energy reduction. However, although data shows a decrease in energy consumption per building, the addition of new space erodes these gains. MSU adds around 2 million square feet every 10 years through new construction and renovation. If campus continues to grow at its current pace, it will not meet current and future greenhouse gas emission reduction goals. The challenge is to balance the needs to build and renovate spaces that support the core mission of the institution with greenhouse gas reduction targets.

Materials Strategies

The goal of the systems team is to reduce waste by 30% by 2015 (below a 2005 baseline). To achieve this, the systems team has focused on waste reduction and recycling.

Through waste reduction and recycling efforts, MSU reduced waste by 5.4% in 2008 (December waste was projected due to the timing of this report). If this continues, the university is on target to meet its goal of 30% waste reduction before 2015, Figure 4.

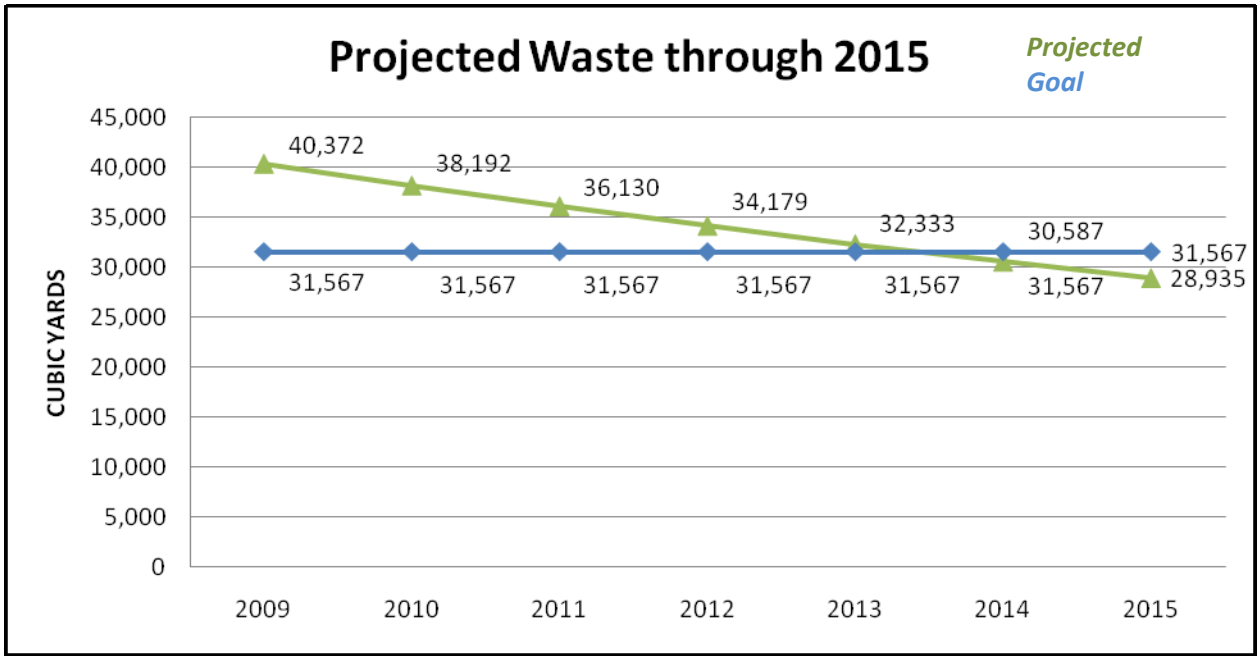


Figure 4. Projected waste to the landfill to 2015. At the rate of 5.4% reduction each year, MSU will meet the 30% reduction goal in 2014.

Phase I of a comprehensive plan recycling began in April 2008. Building occupants and custodians were recruited as environmental stewards (detailed explanation of the environmental steward program is described later in this chapter), supporting MSU's energy reduction, recycling and waste reduction efforts.

Collection for white office paper, mixed office paper, newspaper, corrugated cardboard was expanded to all campus buildings, including residence halls and south campus farms. Tin was also collected in residence hall kitchens; tin and glass were collected in University apartment complexes.

The expansion of recycling collection coupled with the Be Spartan Green environmental stewardship marketing campaign increased recycling volumes in 2008-09. As a result, the existing recycling collection facility has reached its capacity to handle materials. The new MSU Surplus Store and Recycling center will be operational August 2009 and at that time new materials such as #3-#7 plastics, paperboard, and household metals will be added for Phase II of the comprehensive recycling program. Toner cartridges, which have a high market value, will also be captured in Phase II.

MSU Surplus Store operations reduce waste by taking it out of the waste stream for reuse and redeployment to campus departments/units, outside vendors and the public. They provide appropriate disposition of all equipment and non-hazardous materials which are no longer needed by the current departments/units yet have a residual value to the university.

Examples of sales and programs for 2007-08:

- 1.1 million lbs of bulk scrap metal was recovered and sold, generating $187,000 for MSU departments
- 93,193 lbs of electronic waste was destroyed and recycled. All downstream materials from MSU are used in remanufacturing of new commodities
- 2,500 computers were refurbished and sold
- Remanufactured 300 student desks and sold as night stands

- Donated hundreds of pieces of resident hall furniture to non-profit agencies in Michigan, Mexico and South America
- Online stores currently have over 2,000 items listed. Soon to begin selling books on Amazon.com
- Yards sold and revenue generated from the sale of compost, animal waste and bedding generated from University Farms, has increased approximately 44% from 2007 to 2008.

Most products are redistributed on campus and to local vendors. Refurbished products such as computers and furniture are often sold to the public. Bulk scrap metals go to vendors in Lansing and Grand Rapids to be processed. Glass and plastic go to out of state and international vendors (Canada, China). Plastic to China is specifically used to manufacture a mixed plastic resin for new products.

Storage Services provides MSU departments and students low cost managed storage which frees storage space in buildings. Storage options include long and short term heated, non-heated, and 24/7 access. Approximately 30,000 square feet is currently occupied and an additional 23,000 square feet coming on-line after the completion of the new facility.

Pack Up Pitch In Help Out 2008 (PUPI)

Every spring move-out since 1996, MSU students have been donating their unwanted items to area charitable agencies. This is a collaborative effort between Housing & Food Services, MSU Surplus Store, Recycling, Waste Management, and greater Lansing area volunteer groups. The City of East Lansing also hosts its own PUPI in conjunction with the university. This synergetic move-out program is ideal for sustainability, charitable support and environmental stewardship.

The following are examples of materials that were collected and redistributed in 2008:

- 15,157 lbs of clothing, shoes, sheets, blankets and other materials donated to Volunteers of America and Teen Challenge
- Nearly 5,000 lbs of food was donated to the American Red Cross with a credit to the MSU Food Bank
- 84,000 lbs of student room carpet was diverted from the landfill to be recycled or incinerated in a waste–to-energy facility

Purchasing

The Purchasing Department provided leadership on the recommendations to reduce inputs through duplex printing and increased purchase of recycled paper content, increase take back programs and develop environmental input metrics for purchasing systems.

The effort to promote the purchase of duplex printing options was successful. Commodity codes were developed in January 2008 to track information for printers, fax and copiers purchased through the Purchasing Department. There was 100% compliance from January 2008 forward to include the duplex printing option on printers and copiers. This included 41 purchases and 45 pieces of equipment.

The next steps for this recommendation are to work with the environmental stewardship communications team to develop an education program on the appropriate use of 2-sided printing options; to develop an information program so staff and faculty understand the environmental impact

of 2-sided printing; determine if tracking sales through the Computer Store for low dollar printer purchases with and without the duplex printing option is a beneficial exercise.

University Stores developed a marketing campaign (Figure 5) to promote the sale of 30% recycled content paper using a blended cost so the sale price of the paper was the same as virgin pulp paper.

Figure 5. Purchasing advertisement promoting recycling paper

The 30% recycled content marketing campaign produced a behavior change which resulted in an increase of the 30% recycled content paper sales from 19% to 35% of the total copier paper sales (Figure 6).

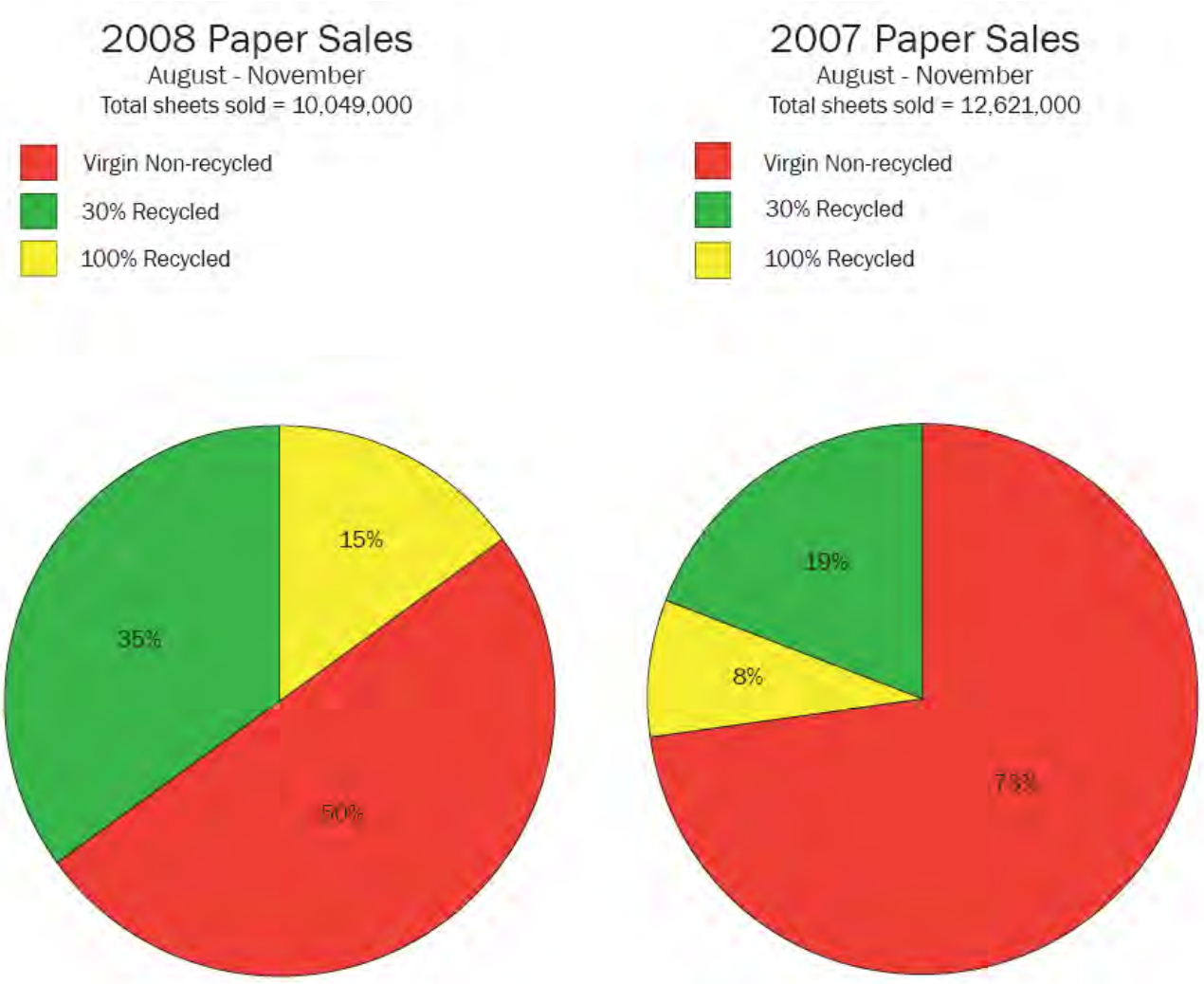


Figure 6. Breakdown of 30% recycled, 100% recycled and non-recycled content (virgin) paper purchased in FY 07 and 08

The sale of virgin pulp paper is still the predominate paper sold, but with continued marketing campaigns the expectation is to see a shift to recycled content paper.

The three major purchasing units, Cyclotron, Food Stores and Purchasing, have worked together to identify the existing take back programs, to identify green cleaning products, to identify commodities for potential take back programs and developed contract language for green purchasing initiatives. Language for environmentally friendly packaging options has been added to the request for quotation and purchase order documents in all three departments. Other green purchasing terms and conditions for specific commodities, such as Energy Star equipment, are being developed and will be implemented in 2009. The green cleaning products list has been shared with Physical Plant Custodial, Housing & Food Services Custodial, the Kellogg Center and the Environmental Building Stewards so that units can make more environmentally friendly product purchases.

There are several new purchasing strategies planned for fiscal 2008-09.

- Mixed office paper sold through University Stores will be tracked. The commodity which consists of paper in various colors is made from 30% recycled content.

- A marketing campaign will be geared towards reducing business class mail and eliminating "Undeliverable as Addressed" (U.S. Postal Services term) mail. Both of these mail streams are mixed office papers collected by Recycling so efforts to reduce the inputs will reduce the campus volume of mixed paper collected for disposal.

- Food Stores is changing its disposable products (cups, plateware, and containers) to compostable product which will reduce inputs as Food Stores issues bids for towel and tissue. Higher content of recycled materials and environmentally friendly options will be considered in the bid process.

- Food Stores is developing a Farm to MSU program. The program has identified and certified 18 Michigan Farm partners for fresh produce. The goal is to increase produce partnerships by 10% annually (where are we currently doing this? Gilchrest Hall?)

Environmental Steward Program

The Environmental Steward (ES) program began in spring 2008 to coordinate with the first phase of the new recycling program. The goal is to have environmental stewards from every department in every building on campus. This has been successful to some degree with 87.5% of the departments in MSU's 579 buildings having one or more environmental steward. The program includes 611 employees, of those, 89.4% are staff, 8.8% are faculty/academic staff, and 1.1% are students. HFS is working to increase the number of actively involved students, drawing from residents and student employees within the residence halls. Eighty-two percent (82%) of the stewards have been oriented at one of the sessions that ran weekly from April 1, 2008 to October 2, 2008.

In addition to recycling information, Environmental Stewards were oriented on waste reduction, energy conservation, and energy efficiency. As the Environmental Stewardship/Be Spartan Green campaign expands or shifts its focus, the breadth of topics ES program is involved is likely to expand.

A persistent challenge is expanding the coverage of campus by recruitment and retention of more interested volunteers to be environmental stewards. Faculty and academic staff have been particularly difficult to recruit, and the numbers show a substantial proportion of environmental stewards are support staff. Support staff play a large role in the inputs (material choice and purchase), material displacement (recycling, reuse), and outputs (energy byproducts of greenhouse gases, solid waste, etc.) of the university. Faculty and academic staff perform all of those roles in addition to contact with students in classroom and laboratory settings, and serving as public face of the university. Culture change must stem from universal involvement.

Feedback, in the form of a building report, is available to stewards monthly. Stewards can check their building's energy use and waste performance through reports generated by the MSU Geographic Information System.

Further development of the program includes creating tools for Environmental Stewards on the Be Spartan Green website. Environmental Stewards have also requested more programming ideas and tool kits to help facilitate behavior change.

Green Certification

The Green Certification program is a department and unit focused effort to encourage units to practice environmental stewardship across the full spectrum of their operations. The program will include a self-assessment checklist, a matching set of “best practices”, and a feedback mechanism to encourage steady improvement in performance. Besides the general department certification, specialized units that have kitchens, laboratories, or other specialized functions will have additional checklists and criteria to review.

The Environmental Stewards would be ideal candidates to perform the initial departmental assessment, but unit administrators responsible for the unit can choose anyone from within their unit to complete the assessment checklist. Although the first year of the certification program the departments will not undergo third party certification, the emphasis will instead be to understand how well the process works and what improvements need to be made for the second year.

In the second year of the program, departments will be certified independently. Departments with high achievements will be recognized as will be those that show significant improvement in year-to-year performance. The Office of Campus Sustainability will help communicate the success of green certificated units, giving the unit added recognition they deserve for their efforts. Since the green certification process involves gathering information from different players within the unit, the direct contact from the assessor with coworkers will help further develop the culture change as the conversation shifts to environmental aspects. Additionally, this program will add purpose to the role of the Environmental Steward and provide the stewards with explicit actions they can take to further their department’s environmental stewardship.

Communication

The communications team has evolved from a small group of students, faculty and staff providing communications support for pilot studies, to a comprehensive campus wide communications campaign. The campaign, Be Spartan Green (BSG), was established to provide recognition for the activities under the umbrella of the environmental stewardship initiative.

Behavior Team research shows that the Be Spartan Green campaign has been successful in that the campus community associates BSG with environmental stewardship activities, however there were gaps in understanding of basic environmental knowledge and translating awareness into action. The next steps in the campaign will focus heavily on communicating campus goals and feedback, basic environmental stewardship education, and providing specific actions the community can take related to energy and waste management. These were the areas identified from the systems team as the most important to communicate this year.

A community based social marketing approach will be used to identify barriers to pro-environmental behaviors and showing how one can remove barriers or provide easier alternatives.

The new messages will be delivered with a new campaign, *Face It: Green Looks Good on You.* The campaign will feature real members of the MSU community and what specific actions they are taking to impact the environment. An updated website will provide more resources and tools for students, faculty and staff, Figure 7. Print, radio and bike billboard advertising will be used to spread the message in addition to participating in promotional events such as staff pairs and contests. At the same time, the communications team will work with the other technical teams to integrate environmental stewardship messages into everyday activities such as new student/new employee orientations and purchasing.

Figure 7. New website template for Be Spartan Green campaign

The team will be exploring diffusion theory and social normative messages to encourage pro-environmental behaviors. The team will identify the key influencers and early adopters to new behaviors and work with them to diffuse the message and actions to support environmental stewardship.

Future Directions

Michigan State University is becoming a key leader in environmental stewardship. The systems team has successfully brought together a diverse group to collaborate and lead the university through campus-wide changes. This task comes with opportunities and challenges. It has become evident that there should be a broader master plan to provide a long-term vision for environmental stewardship beyond 2015. Furthermore, the systems team will come to the point where the simple fixes will be exhausted and transformational changes must occur to make progress. MSU must begin to consider the potential economic and environmental consequences of climate change and how the campus will support its core mission and exist in a sustainable way.

The next set of recommendations begins to prepare MSU to address these challenges, and continue to make incremental progress in energy and waste reduction. The recommendations will provide direction for the following areas:

- Long term planning
- Strategic outreach
- Campus environmental stewardship education
- Recycling and waste reduction
- Energy management - campus growth, offsets, power management, billing

MSU has the right mix of resources to create and share innovative environmental solutions. The next year of the environmental stewardship campaign may be challenging, but should spark more progress and innovation.

Power and Water

Summary

Power and Water within the Physical Plant faces planning issues and future regulation regarding greenhouse gas (GHG) emissions, mercury emissions, particulates and aquifer draw down and recharge rate concerns. With the national presidential change, it is expected that the GHG issue will be addressed at the federal level with a push to pass legislation that is already in committee to reduce emissions by 2015. Currently there is pending legislation in committee to reduce emissions by 2015. MSU's short-term goal is to reduce GHG emissions by 15 percent by 2015 as outlined in the Environmental Stewardship section of this report. The goal will position Michigan State University to align with federal legislation. Power and Water will continue to closely monitor changing regulations. The challenge will be to keep ahead of government mandates.

Analysis

Carbon Emissions and Chicago Climate Exchange

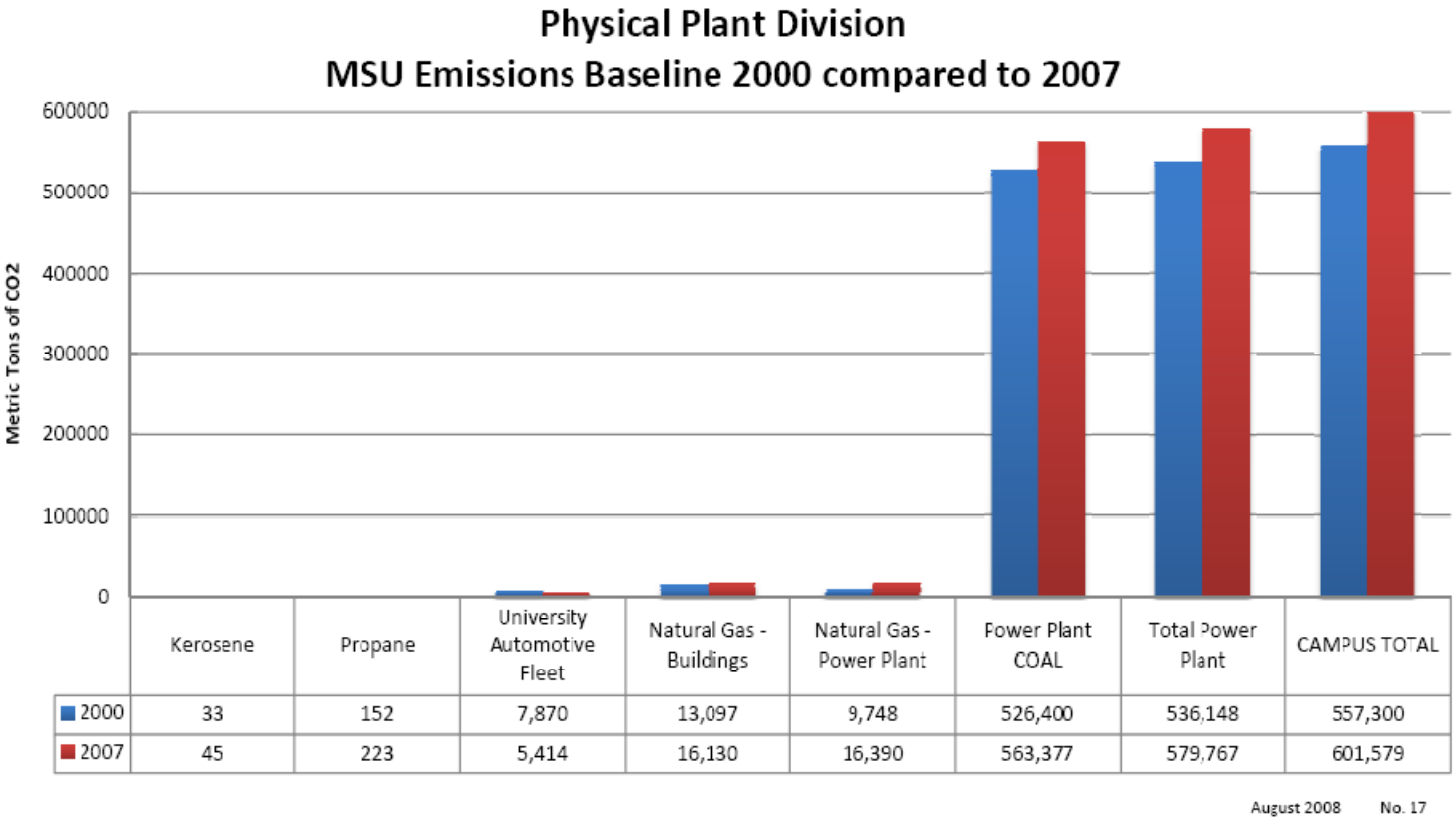
MSU owns and operates a primarily coal fired, cogeneration power plant that serves main campus. This reliable generation source has provided heat in the form of steam and electricity to serve the needs of main campus since 1965. The primary fuel source for the power plant is coal and it is considered a large source emitter of carbon dioxide (CO2), a greenhouse gas. In 2007 MSU joined the Chicago Climate Exchange and made the commitment to reduce GHG emissions 6 percent to below the 2000 levels by 2010.

Multiple strategies for reducing GHG emissions have been implemented including reducing heating ventilating and air conditioning (HVAC) equipment operating time in buildings, classroom consolidation to reduce (HVAC) energy consumption, revising laboratory control systems to conserve energy, HVAC retro-commissioning program, energy audits, implementation of extended HVAC equipment run time policy, and creation of the building level environmental stewardship program. Although strategies were effective in reducing energy, it was not enough to meet the interim CCX and as a result, carbon credits were purchased. MSU bought 23,400 metric tons of carbon credits to offset calendar year 2007 emission increase from two sources. Delta institute provided 18,400 metric tons in credits from conservation tillage and Michigan sustainably managed forest projects. University of Iowa provided 5,000 metric tons in credits from emission reductions at their power plant. The preliminary estimate for true up credits in calendar year 2008 is 31,600 metric tons.

Historically MSU has grown around 2 million square feet every decade. This translates into increased coal burn at the power plant, increased energy consumption on campus and increased GHG emissions. See Figure 1, Physical Plant Emissions Baseline 2000 compared to 2007, which compares calendar year 2000 to calendar year 2007 by fuel type. The largest contributing source for MSU to GHG emissions is the power plant.

A team of faculty, students and staff formed an Environmental Stewardship Systems sub-team to study the feasibility of burning alternative fuel at the power plant in lieu of coal to reduce GHG emissions. The Board of Trustees approved the request for permission to plan an alternative fuel processing center to produce a biomass material to replace coal burned at the

power plant. The reduction in coal burn will reduce CO2 emissions and help meet the existing State of Michigan's renewable generation requirements, the Chicago Climate Exchange commitment and future federal regulation of greenhouse gases such as CO2. The current plan includes burning up to 30 percent biomass in unit 4 boiler which would reduce CO2 emissions by around 6 percent below current levels. Assuming campus continues to grow at the current pace; additional energy conservation measures will need to be taken to reach the CCX goal.



	Kerosene	Propane	University Automotive Fleet	Natural Gas - Buildings	Natural Gas - Power Plant	Power Plant COAL	Total Power Plant	CAMPUS TOTAL
2000	33	152	7,870	13,097	9,748	526,400	536,148	557,300
2007	45	223	5,414	16,130	16,390	563,377	579,767	601,579

Figure 1. *MSU CO2 Emission baseline Compared to Calendar Year 2007*

Energy Conservation and Campus Growth

With the efforts of the Environmental Stewardship Systems Team and the campus community as a whole regarding energy conservation, electrical consumption reductions, ranging from <1% - 20%, have been seen in several buildings on campus. However with the additional square feet constructed on main campus, there was a net increase in electrical consumption this past year. The growth on campus was around 0.67 percent in square feet, (see Figure 2) which normally would have translated into an increase on average of 0.70 percent in electrical consumption.

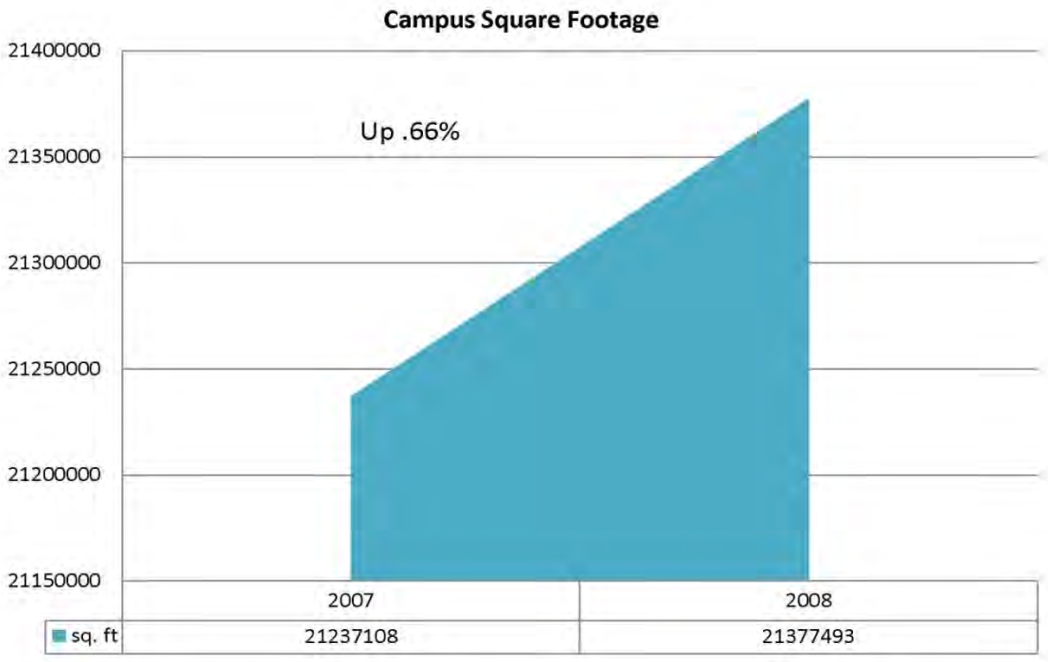


Figure 2. *Campus Growth Footprint*

However with the energy conservation efforts the electrical consumption growth was slowed to 0.25 percent. Figure 3 shows a 464 increase in campus megawatt hours from calendar year 2007 to 2008 (December data is not yet available, so the comparison is between Jan-Nov) which is equivalent to adding forty-three 2,000 square foot homes to campus.

The increase in the campus footprint caused the increase of GHG emissions at the power plant. Based upon the data to date energy conservation efforts alone will not meet the targeted GHG reductions. Fuel switching options from coal to biomass will need to be made at the power plant to meet the GHG reductions for campus.

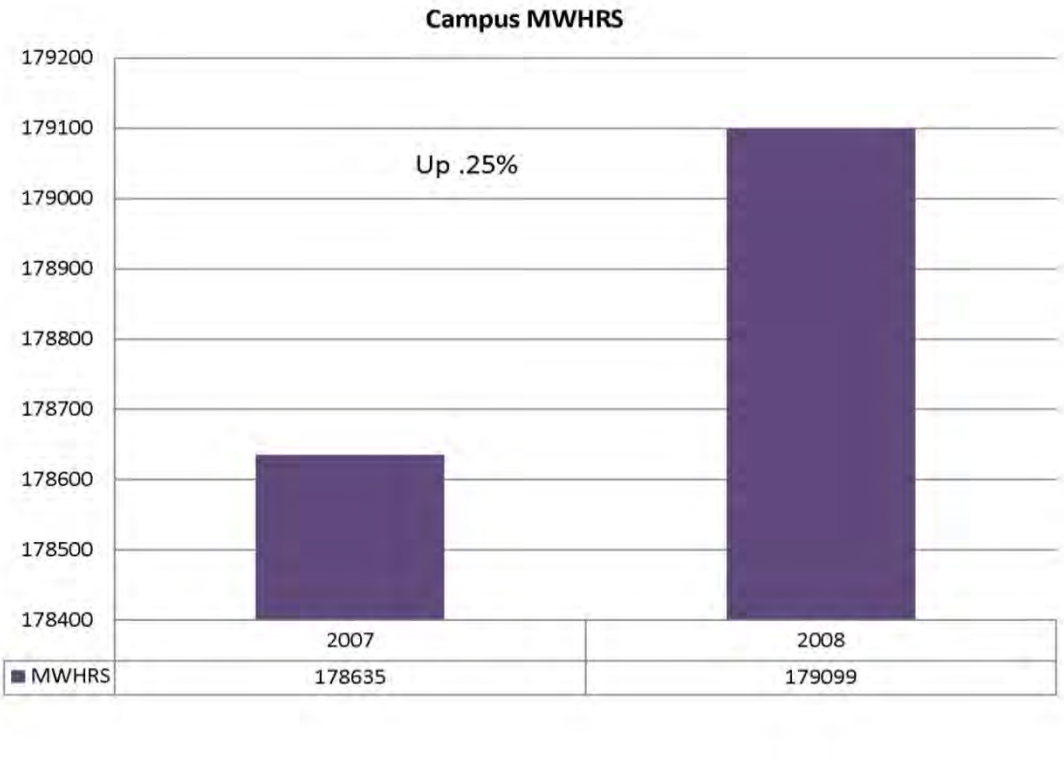


Figure 3. *Campus Growth Electrical Consumption*

Regulatory Activity

Mercury and regional haze regulations for power generation facilities are still in development and under legal debate. Regional haze is the measure of air quality using a visual indication and if a federal term related to locations near national parks. As currently defined, MSU is included in the locations monitored. Mercury emissions come from burning coal at the power plant. Future rules are expected to be forth coming and may impact the MSU power plant depending on the definitions and range of emissions covered. Power Plants across the country, and most recently in Michigan, have been pulled into environmental litigation over the life cycle maintenance of older boilers under historical grandfather practices. Changes in grandfather practices have the potential to impact Simon Plants older units.1-3 before the predicted requirements for new plant capacity.

The EPA has designated carbon dioxide (CO2), a GHG, as a pollutant to be regulated. Recently the State of Michigan passed legislation requiring 10 percent renewable energy production by the year 2015 for utilities in the state in order to reduce GHG emissions and encourage installation of renewable energy sources. The federal government has several legislative proposals regarding GHG emissions and renewable energy, including a cap and trade program for GHG emissions in committee. With the new administration in place, movement on federal legislation regarding GHG emissions seems likely.

Coal Handling Improvements

The coal receiving, unloading and storage systems for the Simon Power Plant are the original systems installed in 1965. Since that time campus growth in energy demand and changes in coal market and environmental management practices warrant modifications to these systems. The modifications will include elimination of a contaminated site identified by the MDEQ; increased capacity to handle 90 to 100 coal rail cars in response to the coal mining and railroad industry movement towards requiring this type of standard transportation method and improved storm water runoff from the coal pile. In response to this need the BOT provided authorization to plan Coal Handling Improvements to the Simon Power Plant in June 2007. An approval to proceed was submitted to the December 2008 BOT to increase the capacity of the coal receiving yard, create strategic coal covered storage and improve storm water management.

Bio Processing Plant

In response to the need for GHG reductions the Environmental Stewardship Alternative Fuels Committee has reviewed looking at burning bio fuels in the Unit 4 boiler of Simon Power Plant. The goal is to substitute a minimum of 8,000 tons of coal burn with either processed bio fuel or urban waste wood. This would result in MSU reducing carbon emissions by 6% below baseline, thus achieving the 2010 CCX goal. The team included research on available resources locally of urban waste wood including MSU property and lower Michigan. The team concluded local wood resources were available and could be obtained by various methods such as contracting for waste wood through a commercial source, implementation of a public drop off for waste wood and utilization of landscape services' waste wood collected from campus property. The cost for waste wood as a fuel is currently comparable or less than coal. Approximate size site necessary for a waste wood drop off processing center is 3 to 5 acres. A permit modification is being developed to burn urban waste wood in early 2009 with the intention to burn MSU waste wood at a minimum. An approval to plan the development of a processing facility was submitted to BOT, December 2008.

Water Resources

Water withdrawal legislation to regulate large water withdrawals in the Great Lakes states has been passed at both the state and federal levels. These regulations may result in mandatory water conservation and will at least result in more scrutiny before permits for new wells are granted. Campus demand for water continues to increase. (Figure 4) The high campus demand for water at times exceeds our capacity to maintain the required level in the storage tank, even with all available wells in service. The main water reservoir on campus holds 1 million gallons. The standard used to determine whether or not a new well is needed is:

$$\frac{\text{Maximum capacity}}{\text{Firm capacity}} = X$$

The firm capacity is the well system total capacity with three wells out of service. New wells are recommended when X is below 1.3. When wells were flow tested in 2007 this ratio was 1.18. Well number eleven had significant problems in recent years and could fail at any time. Well number fifteen is located in a low lying wet area, and the earth beneath the well house is

substantially washed out. Well 15 could also fail at any time and plans should be made to drill new wells with larger capacity to ensure we are able to meet campus demand.

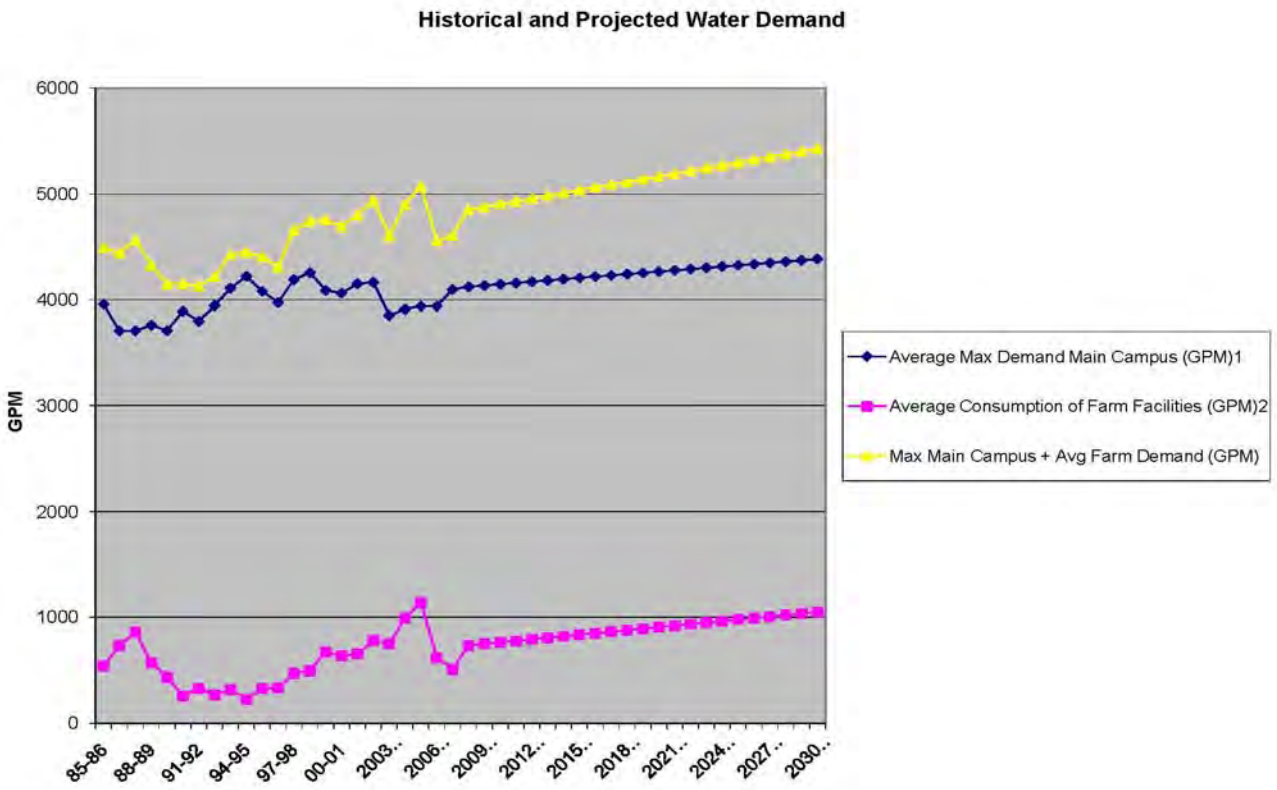


Figure 4. *Historic and projected water needs for main campus, farm facilities and total campus*

Future Directions

Future Power and Water Needs

At the current rate of growth the next power plant addition is projected in 2023. In addition to the need due to growth the existing boilers at the power plant will need to be replaced in the future. Given the renewable generation requirements at the State level and future carbon regulations at the federal level continuing on the path of coal fired additions will not meet emission reductions necessary. Feasibility studies regarding options such as distributed generation (fuel cells or micro-turbines at the building level); small nuclear reactors with recycling of fuel rods; IGCC (integrated coal gasification combined cycle unit); biomass fuel switching; integrated building solar; wind potential sites, etc., should be undertaken to lay the ground work for future generation

Water conservation will also be important in the future. Preliminary studies from the environmental stewardship teams show the potential to reduce water consumption through accelerating plumbing fixture replacement in high traffic restrooms. Additionally, educational campaigns may help reduce individual water use.

Storm Water Management

Summary

Management of campus water resources, particularly storm water, continues to be a priority area for the University. The first 5-year federal storm water permit cycle has come to a close. While the University has made considerable progress in implementing its storm water management program, a new permit was issued in 2008 which requires urbanized communities, including MSU, to meet significantly more prescriptive standards for both the quantity and quality of storm water runoff. While challenging, these requirements present an opportunity for MSU to address storm water management in a more consistent and comprehensive manner across the campus, with the ultimate goal being to establish sustainable storm water management techniques that are integrated into the Campus Master Plan and that support the overarching goals of the watershed management plans developed for the Greater Lansing region.

Some flexibility is included in the new storm water regulations. Communities that anticipate problems meeting the prescriptive standards are able to propose an alternative approach to meeting the new storm water management criteria. To that end, a storm water management master plan is being developed that will serve as the foundation for implementing this alternative approach across the MSU campus. The alternative approach must be approved by the Michigan Department of Environmental Quality (MDEQ). Negotiations are underway between the University and MDEQ to address the alternative approach.

As noted in the 2008 facilities and infrastructure report, the storm water program also contains specific measures that must be met to ensure compliance with the regulations, including public participation and education, illicit discharge detection and elimination, good housekeeping practices, soil erosion and sedimentation control and post-construction runoff control. For the past five years, a team of faculty members, staff members and student representatives have built upon baseline work conducted as part of the MSU-WATER (Watershed Action through Education and Research) initiative to conduct this work. The activities are being undertaken in cooperation with communities across the Greater Lansing region, and support the goals and objectives of the Red Cedar River Watershed Management Plan. The plan was developed in partnership with communities located throughout the urbanized portion of the watershed. These activities have triggered a sustained spirit of student and faculty engagement related to managing campus water resources. Pilot projects that demonstrate sustainable storm water management techniques and that include multi-faceted research, outreach and education components will be a cornerstone of the University's storm water management program over the next permit cycle.

Analysis

Greater Lansing Regional Committee

The MSU campus is located within the urbanized portion of the Red Cedar River watershed (see Figure 1). Throughout the first 5-year permit cycle, the University worked in close cooperation with the Greater Lansing Regional Committee on Phase II Non-Point Source Pollution Prevention (GLRC) to address storm water management. The GLRC is a guiding body established to direct the implementation of the Phase II storm water program for the

twenty individual entities within three locally identified watersheds: the Lower Upper Grand River, the Middle Looking Glass River, and the Lower Red Cedar River watersheds. Through a multi-year process, and with significant input from watershed stakeholders, watershed management plans were developed for the Greater Lansing region watersheds. The storm water program for campus has been designed to meet the goals outlined in the plans. As an ad-hoc member of the GLRC, MSU has been an active participant in the development of the Red Cedar River Watershed Management Plan, and continues to be a primary contributor to the overall work of the GLRC.

Figure 1. *Greater Lansing Watersheds*

New Storm Water Permit Standards

Storm water management efforts on the MSU campus are evolving. A major change in the permit requirements for the next 5-year NPDES Phase II Storm Water program includes more prescriptive regulations for post-construction controls of storm water quantity and quality in areas of new development or significant redevelopment. These standards are to be applied to

each development project of one acre or more, including projects that are less than one acre that are part of a larger common plan of development or sale that would disturb one acre or more. The purpose of post-construction controls is to contain storm water on-site via structural or vegetative best management practices, in order to reduce the volume of water reaching the Red Cedar River and to improve water quality by filtering it before it is discharged. Construction of storm water treatment systems and long-term operation and maintenance of them may significantly affect future project costs and scheduling.

The permit language includes the potential for proposing alternative strategies to meet the requirements, which are subject to approval by the MDEQ. In the absence of an alternative strategy, the regulations require the following:

1) a minimum treatment volume standard to minimize water quality impacts;
2) channel protection criteria to prevent resource impairment resulting from flow volumes and rates;
3) operation and maintenance requirements for all best management practices;
4) enforcement mechanisms and record keeping.

The minimum treatment volume standard would require treating approximately one inch of runoff from the entire development site. The treatment methods must also be designed on a site-specific basis to achieve a minimum of 80% removal of total suspended solids or discharge concentrations not to exceed 80 milligrams per liter. The channel protection standard requires that communities maintain post-development site runoff volume and peak flow rate at or below existing levels for all storms up to the 2-year, 24-hour event.

The MSU storm water committee, comprised of faculty and staff members in the Department of Biosystems and Agricultural Engineering, the Institute of Water Research, and several MSU service units, expressed serious concerns about the ability to maintain storm water volumes and peak flow rates from 2.7 inches of rainfall (the 2-year, 24-hour event), particularly during frozen ground conditions across the MSU campus. Because of the highly urbanized nature of the north campus, with its corresponding high percentage of impervious surfaces, as well as concerns over the infiltration capacity of impermeable soils, MSU is working toward an alternative approach to meeting the storm water standards. The alternative approach may include a banking structure that will allow for storm water credits from areas of campus that are able to hold and treat runoff that can be used in areas of development that will not feasibly allow for meeting the storm water standards. The alternative approach must be approved by the MDEQ. Discussions with MDEQ regarding the proposed alternative approach as well as a timeline for implementation are currently underway.

The foundation for the alternative approach that will be negotiated with MDEQ will be a campus storm water master plan, which will rely on a model that details storm water flow by watershed district on the campus. Each sub-basin that delivers storm water runoff to a particular outfall discharging to the Red Cedar River has been delineated, and best management practice alternatives for storm water control will be examined to determine potential impacts within the sub-basins. An initial hydrologic model for the campus was completed by faculty members and students in the Department of Biosystems and Agricultural Engineering as part of the MSU-WATER project. Over the past year, the model was revised to eliminate data gaps and refine watershed district boundaries. The MSU campus includes 53

active, numbered outfalls discharging to the Red Cedar River with 47 outfalls that have MSU property contributing to them.

The 47 watershed districts on campus were delineated and cross–referenced with improvements identified in the Campus Master Plan. Approximately 75 percent of the improvements proposed in the Campus Master Plan are slated to occur in four main watershed districts, as shown in Figure 2. Because of this, more detailed modeling that incorporates both water quantity and water quality will be conducted in those districts, with additional modeling in other districts to be completed on an as-needed basis.

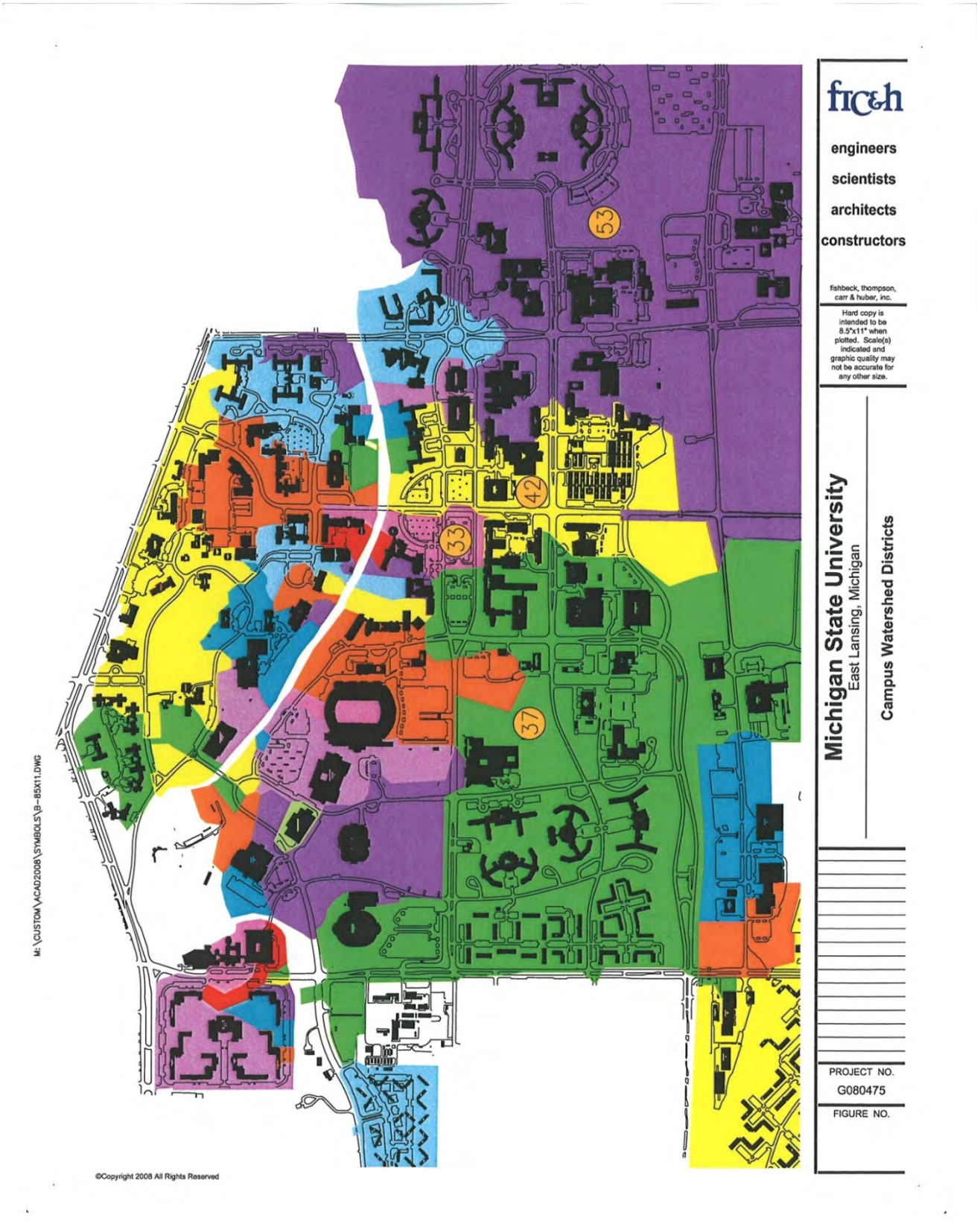


Figure 2. *North Campus Watershed Districts.* Seventy-five percent (75%) of development will occur in four main watershed districts, 33, 37, 42, and 53

Campus Storm Water Management Master Plan Development

Storm water policies and practices must allow the University to continue to grow while providing for sustainable water resources management. The watershed basin modeling that has been completed will serve as a primary component of a comprehensive storm water plan for campus, which will in turn provide the basis of an alternative approach to permit compliance.

In addition to predicting potential drainage problems so they can be avoided, the storm water master plan will document the water quantity and quality requirements associated with facility improvements identified in the Campus Master Plan, and identify specific strategies to meet those needs, with an emphasis on Low Impact Development techniques for controlling storm water runoff. LID techniques incorporate comprehensive land planning and an engineering design approach with the goal of maintaining and enhancing the pre-development hydrologic regime of urban and developing watersheds. Goals of LID are to minimize discharge rates, runoff volumes, and peak flow rates or to maintain pre-development runoff conditions. The use of LID reduces the need for large storm water holding systems, such as dry retention facilities, and allows the use of smaller, less expensive, storm water collection systems. Examples of LID techniques are shown in Figures 3 and 4.

Figure 3. *Green Roof project on the top of the Plant & Soil Science Building.*

Figure 4. *Erickson Hall Bioretention Basin (Rain Garden).* The rain garden cleans storm water by filtering pollutants such as sidewalk salt and sediment as water drains through the soil. Cleaner water infiltrates through soil and flows into the Red Cedar River.

In the MSU storm water master plan, a “green calculator” will be applied to assess the effectiveness of the available LID best management practices. The plan will identify locations, sizes and costs associated with construction of the proposed green infrastructure within the campus watershed districts. A methodology for cost allocation for storm water management will also be included. The storm water plan will also be fully integrated with an update of the Campus Master Plan, which is scheduled for 2011.

Additional Data on Storm Flow/Modeling Needed

The existing HEC-HMS storm flow model will be used to assess both the adequacy of the existing storm water collection system as well as the drainage improvements necessary to accommodate future facility improvements. A detailed hydraulic model will be developed for the areas of campus where new facilities are planned. The existing storm sewer mapping and topographic mapping will be used in this evaluation. Storm water information needed for areas of new development will include conveyance and storage capacity, routing and site selection, schematic design and cost estimates that consider long term operation and maintenance of the storm water controls.

Illicit Discharge Detection and Elimination

One important component of the campus storm water management program is the Illicit Discharge Elimination Program (IDEP). The purpose of the IDEP program is to identify and remove illicit discharges to the Red Cedar River, and to encourage reporting of water quality problems and possible illicit connections and discharges. The University has completed a dry-

weather sampling program for streams on the campus, and will continue to periodically assess the quality of water in the outfalls along the river corridor. In addition, MSU Housing and Food Services (H&FS) continued its investigation into illicit discharges from residential halls. The original study indicated several discharges from water softeners located in the buildings' mechanical rooms to adjacent storm drains. An aggressive timeline for corrective action was developed for the discharges. The plan called for work on the systems to start in 2007 and be completed in 2010. H&FS has completed the separation of the softeners and floor drains from the storm sewers and connected them to the sanitary sewers in all but one building. Owen Hall will be completed as soon as the CP08053 Footing Drain Project is completed. Work on this building will be completed by 2009. This will complete all of the work identified in the study. A similar study is underway for general fund buildings on the MSU campus.

Future Directions

While much has been accomplished over the first 5-year permit cycle, tremendous opportunities exist for implementing improved storm water management techniques. One goal of campus storm water efforts thus far has been to identify pilot projects to demonstrate sustainable storm water management approaches across the campus. MSU is currently installing an innovative bioretention facility to treat storm water from the Farm Lane railroad underpass. Bioretention is a technique that combines management of storm water quantity and conveyance with the treatment of pollutants. Storm water from the surrounding roadway and sidewalks drain to the low point of the underpass where it will be pumped into a multi-basin bioretention facility. The bioretention facility offers the opportunity for educational and research experiences across multiple departments for both undergraduate and graduate students. Additional demonstration sites will be sought to highlight LID techniques on the MSU campus.

MSU continues to address internal storm water management priorities by working with neighboring communities to ensure that sound practices are implemented across the Red Cedar River Watershed and other watersheds in the Greater Lansing region. The University will seek to gain full membership, through passage of a resolution, within the GLRC at the start of the new permit cycle. This will allow MSU to be formally recognized as a fully-engaged member of the GLRC, will help to increase visibility of the important storm water pollution prevention work the University has already implemented and will allow the University to realize cost-efficiencies by pooling resources for work that benefits both the campus community and the Greater Lansing Region.

The University will continue to move forward with innovative outreach programs that encourage storm water-friendly management activities, and plan for and implement best management practices to protect the Red Cedar River. While still being negotiated, the alternative approach to meeting the federal storm water regulations will likely produce useful experiences and information about managing storm water that can be shared with communities statewide. To further encourage responsible stewardship of campus water resources, water will be emphasized in the coming years as part of the University's Boldness by Design initiative. With the involvement of students, faculty and staff, as well as neighboring communities, it is hoped that the MSU campus will serve as a model for demonstrating water quality and storm water best management practices to communities across the state.

Safety, Security and Emergency Preparedness

Summary

The safety and security of the campus community remains an utmost priority and MSU strives to be proactive in its efforts. Events that have occurred at Northern Illinois, Virginia Tech, and the University of Iowa has provided MSU an opportunity to think about the lessons these institutions learned and how they might apply to MSU. Work continues in exploring and expanding investments in emerging and changing technologies, continuing to improve resources and programs that advance the safety and security on campus and enhance emergency preparedness for the university community at large, its facilities, and infrastructure.

The first of a five year plan to install electronic card access on exterior doors is completed. The potential for catastrophic flooding and MSU's ability to mitigate the impact has been a part of emergency/catastrophic planning and with the issues the University of Iowa learned, there is still ongoing reviews to occur. Residence Life and the Housing & Food Services have worked collaboratively to review their practices and have made several improvements to enhance and improve safety and security in the residence halls. MSU continues to augment its ability to respond to emergencies by making strategic investments in equipment and systems as well as developing its human capital. While much has been accomplished, the work is far from complete and MSU will continue to be challenged with balancing multiple priorities with finite resources.

Analysis

Electronic Card Access

In 2006-07, the campus Safety and Security Committee, and other key personnel, were charged with developing security measures to mitigate the highest risk areas of the university relative to health, safety, and physical security. An enhanced security checklist was developed to assist units in identifying areas and levels of risk that required enhanced security measures and the appropriate method to secure these spaces. This checklist was incorporated into the Construction Standards and included in these standards was the requirement for electronic card access on exterior doors of new buildings, additions, and major renovations. Additional stipulations require card access for all mechanical, electrical and telecommunication rooms as well as ensuring the necessary conduit is installed throughout the interior spaces. As labs and spaces are moved in the future this provides the greatest flexibility for use of the space as needs change.

A five-year transition plan was developed in an effort to implement the policies and procedures of card access and enhanced security measure for existing campus spaces both in terms of outside doors of buildings and the also interior spaces. The plan included funding for high risk buildings to convert exterior doors and physical plant rooms to electronic card access. Interior spaces requiring enhanced security were also indentified and funded by the units. The plan is to be completed by 2012. The first year of this plan has been completed and six buildings received electronic card access on exterior doors and physical plant rooms.

In the past year, the number of buildings with exterior card access has increased by 32.5% and is projected to increase another 34% at the completion of 2008; see Figure 1. Figure 2 represents the number of card readers added to the system, shows a 54% increase over the past year, and projects another 34% rise at the completion of 2008. As one would expect as the number of buildings and readers continue to rise, the number of users in the access will also increase. Figure 3 represents the increase in access users to the system and shows a 30% increase in system users since 2006 and projects another 73% increase at the completion of 2008.

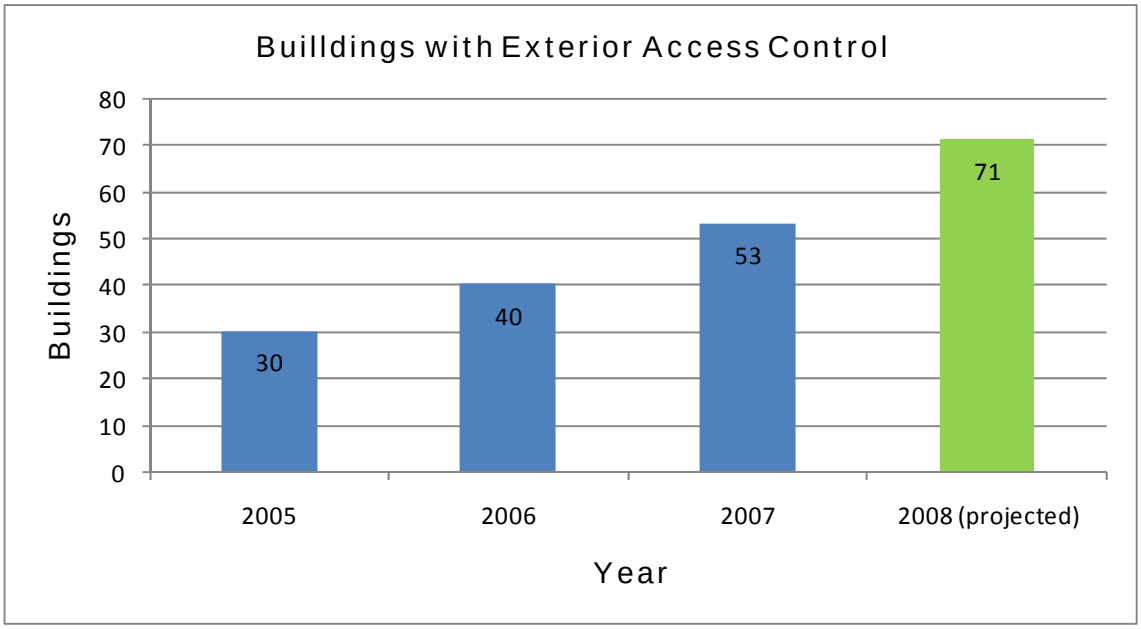


Figure 1. *Buildings with Electronic Access Control*

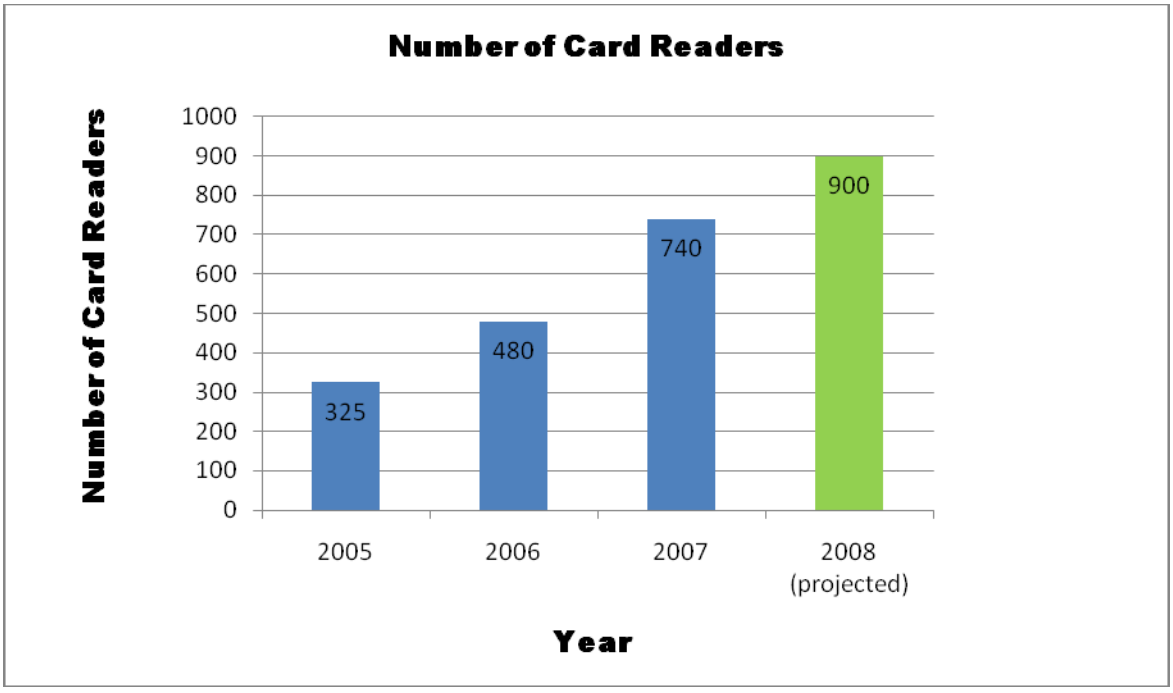


Figure 2. *Number of Card readers*

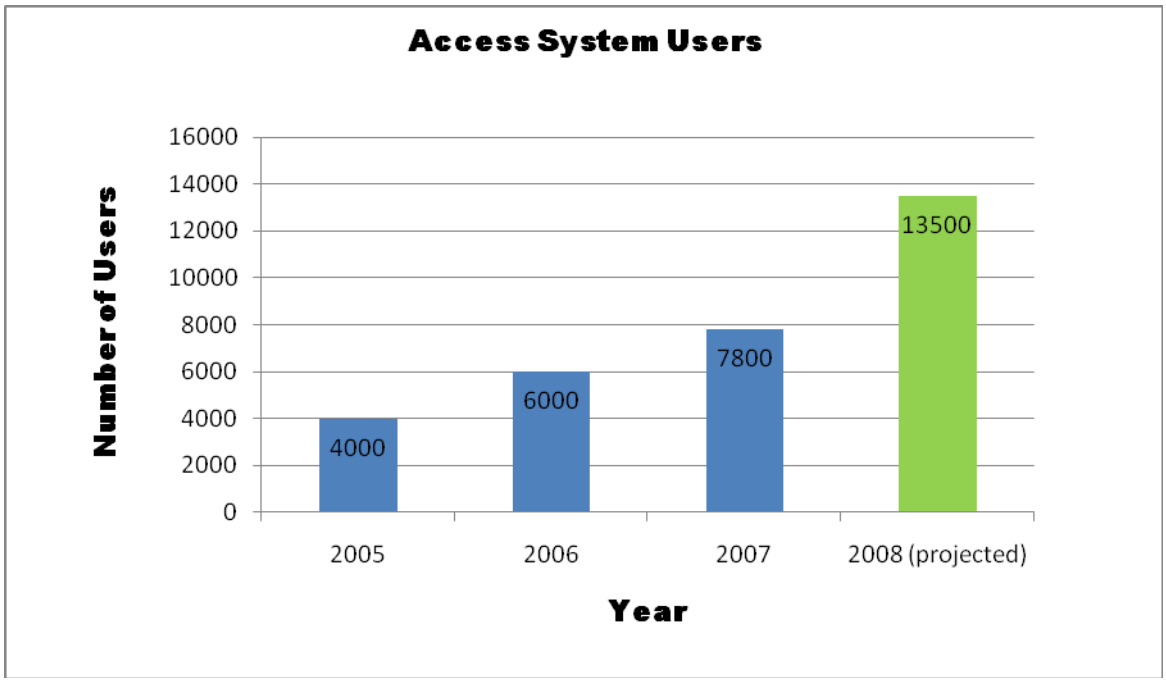


Figure 3. *Number of Users in the Access System*

System integration with Housing and Food Services controlling building access and security in the residence halls has begun. This has added approximately 1,500 additional users to the size of the system. The integration of the two systems has been successful but meeting the diverse needs of the residence halls will continue to be a near term challenge.

Spartan ID Card Project

The Spartan ID Card Project was created as a result of the enhanced security measures being implemented throughout campus and the desire to move from keys to access cards. Specifically, the goal was to use a universal card stock in the production of the MSU ID card so that the ID card could be used for a variety of functions on campus such as building access, parking, library services, meals plans and so forth. This created an opportunity for MSU to take a comprehensive look at the Identification card and to develop a plan to improve and enhance the card.

The University has provided its students, faculty, staff, and persons affiliated with MSU, an identification card. Over time, this identification card has seen an increase it its demand and use for services throughout campus. As the use and need for the card has grown, we have continued to operate in a decentralized manner without providing centralized coordination or management of the card. As a result, MSU has missed opportunities to practice efficiencies, or to think and plan strategically. The ID card is used for more than identification and therefore, it must be recognized as a whole program rather than an individual piece such as a library card or a door access card. A Boldness

By Design initiative has been developed to focus on enhancing the identification card and moving into a one-card program.

Risk Management for Catastrophic Flooding

Because of the proximity to the Red Cedar River, MSU will always have a risk of flooding. While the impact on the property and operations of the university can be severe, this is a financial risk which cannot be easily transferred to someone else. Flood insurance from both the federal government and private insurers is expensive and only provides a limited amount of protection. While MSU does maintain some insurance through both sources, the focus in the future needs to be on taking prudent steps to reduce the potential impact of a catastrophic flood on the operations of the University.

Floodwater can enter into buildings through steam tunnels, sanitary sewer lines, storm water discharge lines, floor drains, wall penetrations, vents, windows and doors. In 2004, some steps were taken to mitigate the risk of flood for certain buildings in the north campus. An inflatable flood barrier system was procured to protect the Computer Center and the Administration Building. See Figure 4.

Six concrete bulkheads were installed within the steam tunnel system. Valves were installed within the sanitary and storm sewer lines to allow closure as part of a flood response plan. The walkway on the northwest corner of the Library was raised to act as a levee and prevent water infiltration through the basement walls for a 500 year flood.

Additional means of flood mitigation are being explored, specifically looking at flood control measures beyond the use of a bladder. Tabletop exercises will likely be used to prepare for potential floods.

Flood Barriers Admin Area

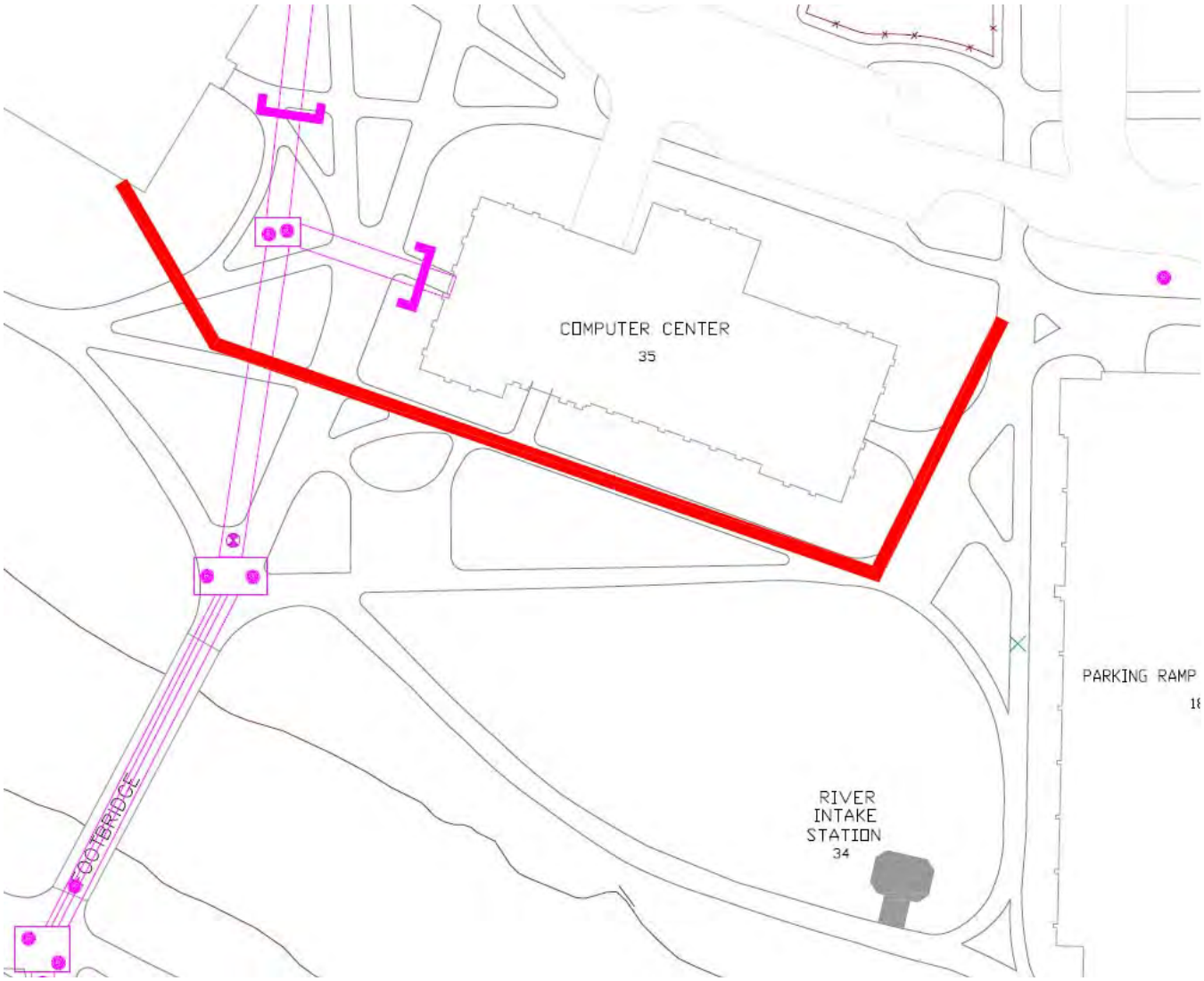


Figure 4. *Flood Barriers Admin Area*. The flood barrier is shown in red, purple 'C' shaped areas indicate location of bulkheads.

A campus map with an overlay of the 100 year flood plain from the Michigan Department of Environmental Quality (MDEQ) is provided as background. See Figure 5 and 6. Some of the original University Village Apartments on Kalamazoo Street were previously located in the flood plain. All of the new apartments constructed in 2007 are now outside of that area. An engineering study of the Kellogg Center and Brody Complex in 2004 identified some measures that could help mitigate the impact of severe flooding that include installing a removable bulkhead system within the steam tunnels, a removable flood barrier consisting of water filled linear bladder tanks and additional concrete bulkheads at steam tunnel entrances. The study also suggested installing manual gate valves on storm and sanitary sewers and grouting of utility penetrations where service entrance lines come into buildings. The upcoming renovation of the Brody complex presents an opportunity to implement some of these additional flood protection measures.

Flood Zones

In order to more fully understand the potential areas of vulnerability in the event of a flood, a hydraulic analysis of the Red Cedar River from Bogue Street to the western edge of the campus is currently being conducted. This analysis will produce a more precise model of where the flood waters will go based on the topography of the land. The results of this analysis will be compared to existing flood maps and will aid in making decisions about specific flood protection measures which could be implemented in the future to reduce this risk.

Flood Zone Map for Michigan State University

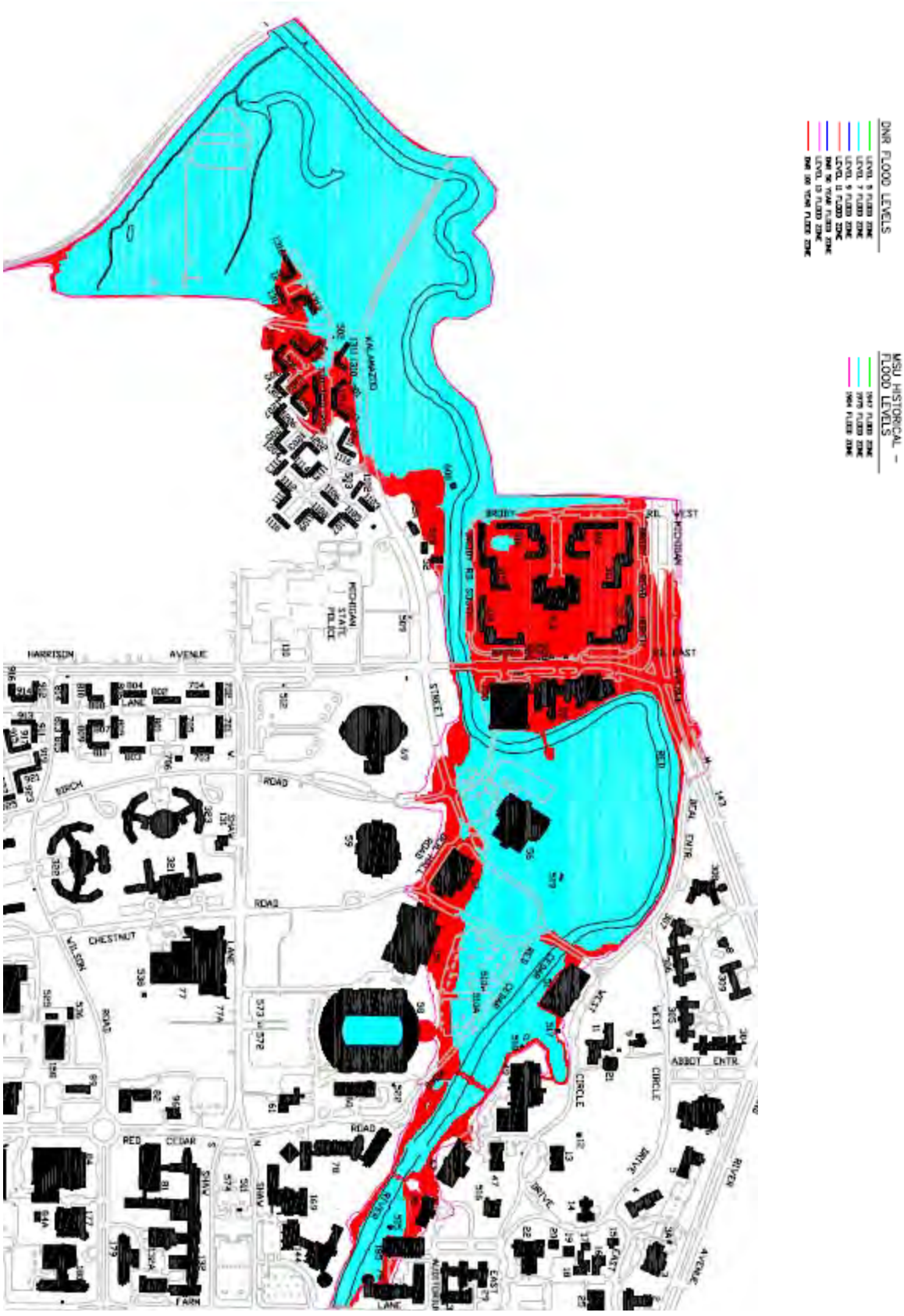


Figure 5. Red Cedar River flood zones west of Farm Lane

Flood Zone Map for Michigan State University

Figure 6. Red Cedar River flood zones east of Farm Lane

Residence Hall Safety & Security

A Residence Hall Safety and Security Committee that includes membership from both Residence Life and Housing & Food Services are working collaboratively to implement a series recommendations designed to improve the overall safety and security of the residence hall community. At the core of this initiative is an emphasis on a holistic, centralized approach to the residence hall community. For many years, the residence halls operated in a decentralized manner that resulted in varying policies and procedures throughout the different residential complexes. Resources are now used in a collective, strategic manner to provide a consistent approach to safety and security across all residence halls.

The committee focused on four key areas--policy, facilities, personal safety, and human resources. Some examples include an evaluation of emergency response protocol with a focus on critical incident procedures and systematic on call responsibilities; reviewing all key policies, and the Night Receptionist Program; establishing a communication plan that provides consistent messages regarding health and safety and developing a comprehensive emergency training program for all staff and students.

Emergency Preparedness

MSU continues to look at ways to enhance its emergency systems. The key however, is not only having the best tools available but also to invest in emergency preparedness planning in all units. To achieve the best possible response to an emergency it involves the help of many people. Training others to be prepared in an emergency whether it be actions to take in an evacuation or advanced training programs that teach standards for assisting with emergency preparedness, response and recovery, is critical to the MSU's success in handling an emergency.

Emergency Messaging

Currently the University uses several methods to deliver emergency messages; this includes Reverse911, Etext, media, tornado sirens, mass email, pagers, National Oceanic and Atmospheric Administration *(*NOAA*)* radios via Civil Emergency Message, web sites, and 1-888-MSU-Alert. With the exception of tornado sirens, all of these methods of communication take anywhere from several minutes to potentially hours to create, launch and deliver the message.

Reverse911 takes several minutes to build, launch, and then depending on the size of the message and the number of recipients, several more minutes to be received (if someone is there to answer the phone). Etext sends an email to the cellular telephone of users who have voluntarily enrolled. There are currently 16,000 devices registered. This system is almost totally dependent on the Cellular network as to when the subscriber receives the message.

Another method of emergency messaging MSU is actively pursuing is a "Big Voice" public address system that includes outdoor speakers placed strategically throughout campus. It is a relatively instant means of creating and delivering a message to a large volume of people. Either via a microphone or telephone, the

message can be delivered to all within hearing range and can be crafted to provide specific instruction e.g. “Avoid Berkey Hall, active shooter reported”. The system could be particularly effective at getting a message to students between classes, or to other outdoor locations such as the intramural field. The plan includes integrating this system into existing and future building public address systems like those commonly found in new fire alarm systems. It appears that grant funding may be available from the U. S. Dept. of Education for this type of project and MSU expects to pursue the funding as appropriate.

Emergency Action Teams (yellow hats)

The Michigan Occupational Safety and Health Act (MIOSHA) specifies that the employer have plans for emergency situations and train some workers to guide the actions of others. Every building/unit on the MSU Campus has a written emergency action plan that identifies the actions that students, staff and visitors are to take in the event of an emergency or disaster. These emergency actions are guided by members of the Emergency Action Team in each building and are identified by the yellow hard hats that they wear. Team members are trained to guide evacuations and sheltering in the event of a fire, a weather sheltering event, a hazardous atmosphere shelter event, and any building specific hazards that have been identified. The program identifies rally points for the purpose of accounting for building occupants, a building team structure to provide guidance during the emergency and to provide a contact for emergency responders.

The challenges in maintaining such a program are many. Frequent changes in job assignments and locations require the recruitment and training of additional building team members. Team members are generally formed around building occupants who are consistently available. Unfortunately, this has not covered evening and nighttime occupancies very well in the past.

Therefore, MSU is expanding training to persons who work outside of normal business hours, mostly custodial employees. An Angel site for the team members has been established that contains training information.

Community Emergency Response Team (CERT) Program

Citizen Corps is a national emergency protocol that has several elements dealing with volunteer forces. Community Emergency Response Team (CERT) is one component trains civilian volunteer forces in recognized standards for assisting with emergency preparedness, response, and recovery. To date, over 125 MSU volunteers have been trained in a variety of topics, including: signs of terrorism, disaster preparedness, traffic control, 2 way radio protocols, disaster medical operations, triage, Incident Command Systems (ICS), light search & rescue, and fire safety. This training can be modified to allow for shorter versions of training (1-3 hours) or the full complement of modules (20 hours) to teach the necessary information for the attendees.

This program is also part of a national initiative to bring CERT to campus environments in a modified version known as Campus CERT (C-CERT). C-CERT

is being taught across the country by the School of Criminal Justice through a Department of Homeland Security grant. MSU is one of the first major universities in the nation to implement a C-CERT program and is often used as a model for others in how to create and implement teams.

Teams work as volunteers for large gatherings on campus, as well as events within this area such as Common Ground, Ingham County Fair, and Silver Bells in the City. The long range benefit of the program is once individuals leave MSU, the skills are transferable and can help assist other communities be more prepared. By engaging faculty and staff members, MSU is ensuring proactive partners in its response and recovery efforts.

In the future, MSU major venue site staff will be trained in a modified version of C-CERT which will enable the staff to assist MSU Police in an emergency. MSU Police will also work proactively to "stage" the volunteer's equipment at various large events that will provide MSU with ready reinforcements in the event of a catastrophic occurrence.

Future Directions

Rapid expansion of the access control system has presented its own challenges. The current system software has reached its design limit and MSU is transitioning to a new system. The new system has capabilities that are significantly greater than the original and all future installations will use the new software.

The growth of the system has resulted in increased demands on the Access Control Unit staff in the MSU Police Department. In addition to bringing new buildings and users online, the staff must also respond to the changing needs of existing users. The number of users in the system has grown by 73% over the past year which has contributed to increased special requests and modifications to existing systems. One solution that will assist with the increasing demands is the development of a web interface that allows for a more efficient process to update changes to the system. Implementation of this new web interface is expected in the first quarter of 2009.

Housing and Food Services expects to implement card access on all of the residence hall exterior doors within three to four years. Housing's plan coupled with the five year card access plan will contribute to the expected exponential rise in the size of the card access system. The need to continue to seek creative solutions to the challenges facing rapid growth of the system will be paramount.

MSU Police in conjunction with Housing and Food Services is exploring a multimodal messaging service, Connect-ED. In the event of an emergency, this would provide MSU with the ability to quickly alert the entire campus community at multiple contact points, including cell phones, home phones, campus phones, PDAs/pagers, e-mail accounts, TTY/TDD devices for the hearing impaired, and networked digital signage.

Safety, security, and emergency preparedness will always be a high priority for MSU. The challenge will be the ability to find creative solutions to the multiple needs in this area while recognizing there are limited resources.

Traffic Safety & Parking

Summary

The “city” that is MSU presents unique traffic safety issues. With 18 miles of streets, more than 25,000 parking spaces and over 110,000 vehicle trips per day, the University is challenged every day to provide a safe and orderly traffic environment for pedestrians, bikes, vehicles and mass transit as well as adequate parking for the campus community and visitors.

Analysis

Traffic Safety

In 1995, the MSU Police Dept. reactivated the Office of the Traffic Engineer to develop and implement a comprehensive program focusing on accident reduction and up to date traffic management for the University community. Multi-year efforts in the areas of intersectional re-design, signage up-date, traffic volume counts, and the construction and analysis of a traffic accident data base resulted in a profound reduction in traffic accidents and a safer community for all. These efforts were rewarded by the receipt of the 2007 Michigan Governors Traffic Safety Award.

Concurrent with the last three years of that project, a separate analysis of the traffic conditions and accident history of West Circle Drive was undertaken. The study revealed a significant pattern of serious accidents occurring in the areas of on-street bay parking and at the MSU Museum loop and nearby intersections. The accident information provided the impetus to construct the Grand River Parking Ramp, to increase convenient off-street parking, and the removal of much of the on-street bay parking on West Circle Drive. Each progressive year another section of parking bays was removed, the intersection of West Circle Drive and Auditorium Road was rebuilt, the direction of traffic flow was changed at the Museum loop, and as a result, the number of accidents was reduced. The results of these efforts are reflected in accident statistics in Table 1 and with the before and after accident maps, Figures 4 and 5. Each dot represents one accident in Figures 4 and 5 and represents a 78% drop in accidents from 2004 to 2007.

Table 1. *Accident Statistics and Safety on Circle Drive*

Location	2008 Total accidents	2007 Total accidents	2006 Total accidents	2005 Total accidents	2004 Total accidents
Beal Entrance at West Circle	3	1	7	6	9
Kalamazoo at West Circle	2	7	9	9	7
West Circle b/w Beal and Kalamazoo			1		
West Circle b/w Beal and Abbott		1	1	2	9
West Circle b/w Kalamazoo and East Circle	2	2	3	3	12
West Circle at Abbott Entrance	6	9	12	20	10
West Circle at East Circle North	5	1	1	1	2
West Circle b/w Abbott and East Circle		1	2	2	13
West Circle at Chittenden/Old Botany		1	3	4	4
West Circle from split to East Circle merge West Circle at Lot 6 exit			4	1	3
All of West Circle	18	23	43	48	69

West Circle Accidents 2004

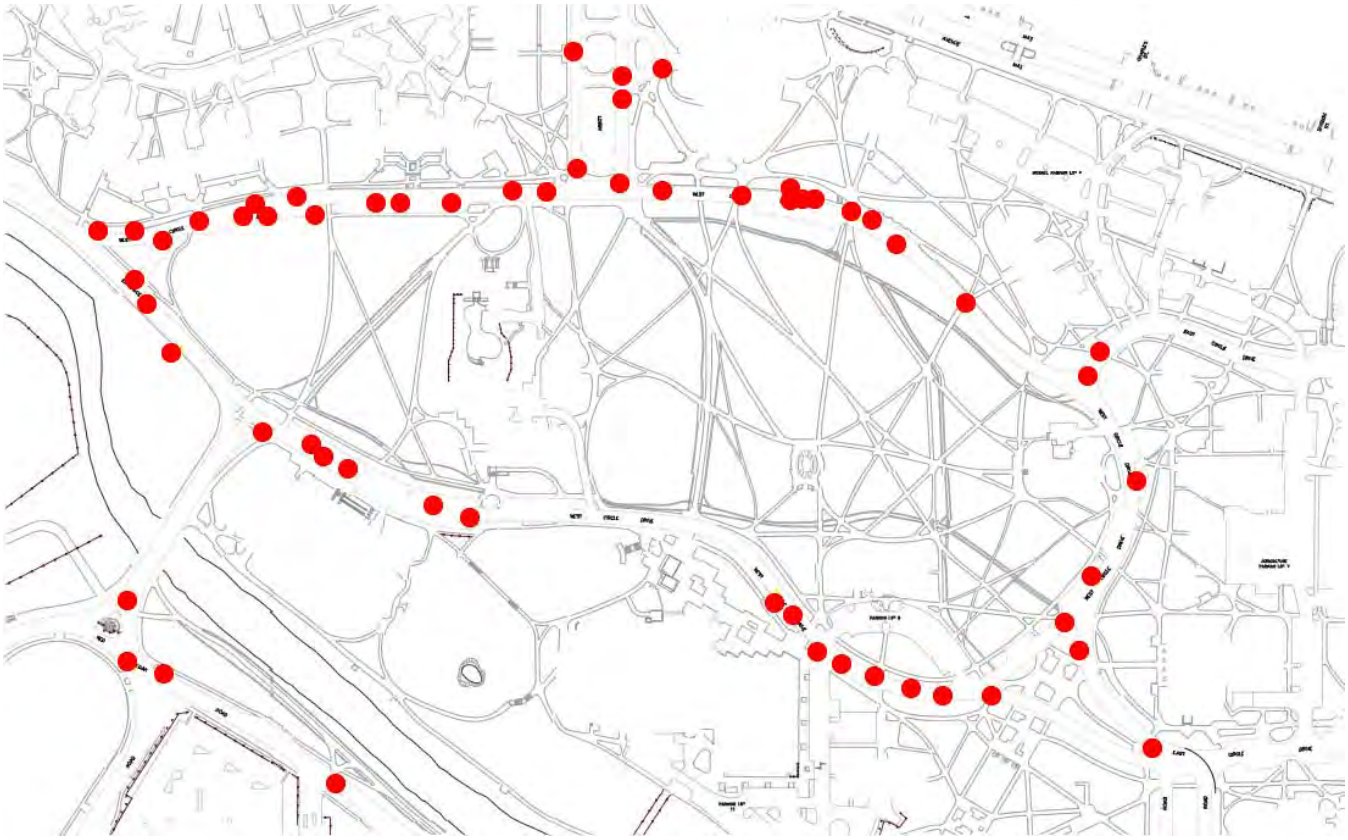


Figure 1. *West Circle Accidents 2004*

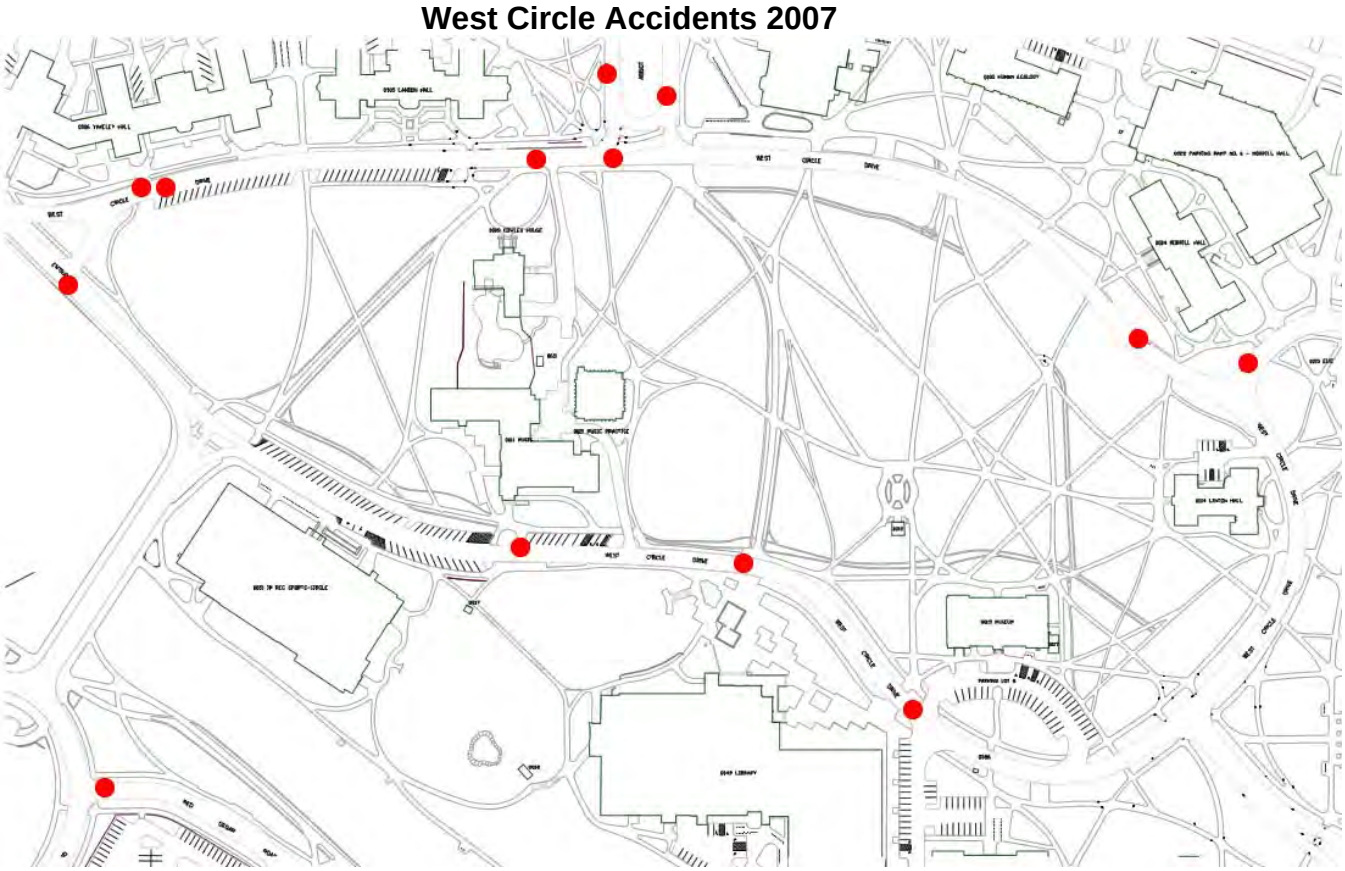


Figure 2. *West Circle Accidents 2007*

Bicycle Circulation System

Currently 40 percent of the campus roadways include bike lanes. All future roadway reconstruction efforts will accommodate either formal bike lanes or space for them so they may be completed in the future when a safe and interconnected linkage with other bike lanes is available. Two major corridors are nearly complete that provide both north-south and east-west circulation.

By fall 2009 the Wilson Road corridor will include bike lanes from Harrison Road to the IM East fields.

With completion of the Farm Lane underpass project and transformation of the former Collingwood Entrance into the reconfigured Farm Lane Entrance, this major north-south corridor will have complete bike lanes with the exception of the segment between North Shaw Lane and Wilson Road. This area will undergo a traffic study when the underpass project is complete to assess required turning lanes and lane geometry in order to incorporate bike lanes in the safest possible manner.

In addition, priority should be given to the proposed bike path upgrade along the Red Cedar River due to its heavy use and interconnection with the Lansing River Trail.

Figure 3 represents existing and future bike lanes and paths.

Bike Lane and Bike Path Inventory

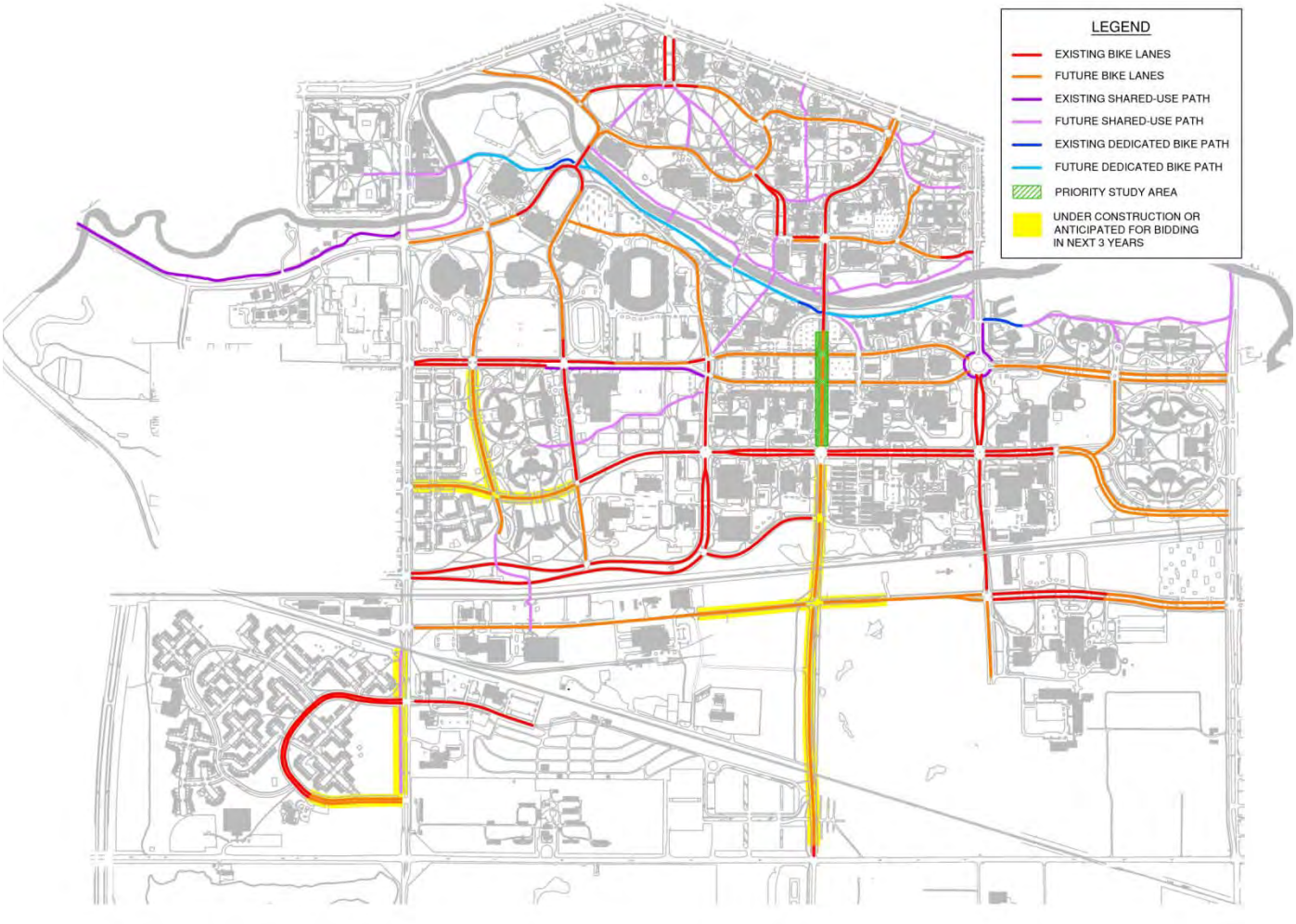


Figure 3. *Bike Lane and Bike Path Inventory*

Parking

The total campus parking supply north of Mount Hope Road is approximately 24,600 spaces; a slight decrease of approximately 380 spaces since the 2020 Vision Master Plan was completed in December of 2001. While parking has been added through some major new facilities like the Grand River Ramp, a majority of this decrease can be attributed to the implementation of barrier-free parking spaces per the American's with Disabilities Act requirements and the demolition and reconstruction of University Village and the partial demolition of Spartan Village.

The total parking supply for faculty, staff, and graduate assistants is approximately 10,960 spaces; an increase of approximately 650 spaces since the 2020 Master Plan was completed. The overall parking ratio of available supply to population has decreased slightly from 0.90 to 0.87. This means we are currently providing parking spaces for 87 percent of our faculty, staff, and graduate assistant population. The 2020 Vision Master

Plan established a target address the anticipated population increase within the Central Academic District and the ability to provide parking to meet this growing demand.

The following table provides a breakdown of the parking supply, population, and the effective ratio of available parking for faculty, staff, and graduate assistants reflecting the study areas defined in the 2020 Vision Master plan.

Table 2. *Parking Data Comparison by Study Area*

Study Area	2020 Plan Supply	2008 Supply	2020 Plan Population	2008 Population	2020 Plan Ratio	2008 Ratio
North Academic	2,393	2,599	3,222	3,240	0.74	0.80
Central Academic	4,409	4,857	5,747	6,583	0.77	0.74
South Academic	874	896	1,030	1,050	0.85	0.85
Service	823	813	470	440	1.75	1.85
Athletics	679	731	116	320	5.85	2.29
East Residential	892	817	669	720	1.33	1.13
West Residential	240	244	190	238	1.26	1.03
Totals	**10,310**	**10,957**	**11,444**	**14,988**	**0.90**	**0.87**

Figure 4 illustrates the study area boundaries and compares the parking ratio in each study area between today's data and that included in the 2020 Vision Master Plan.

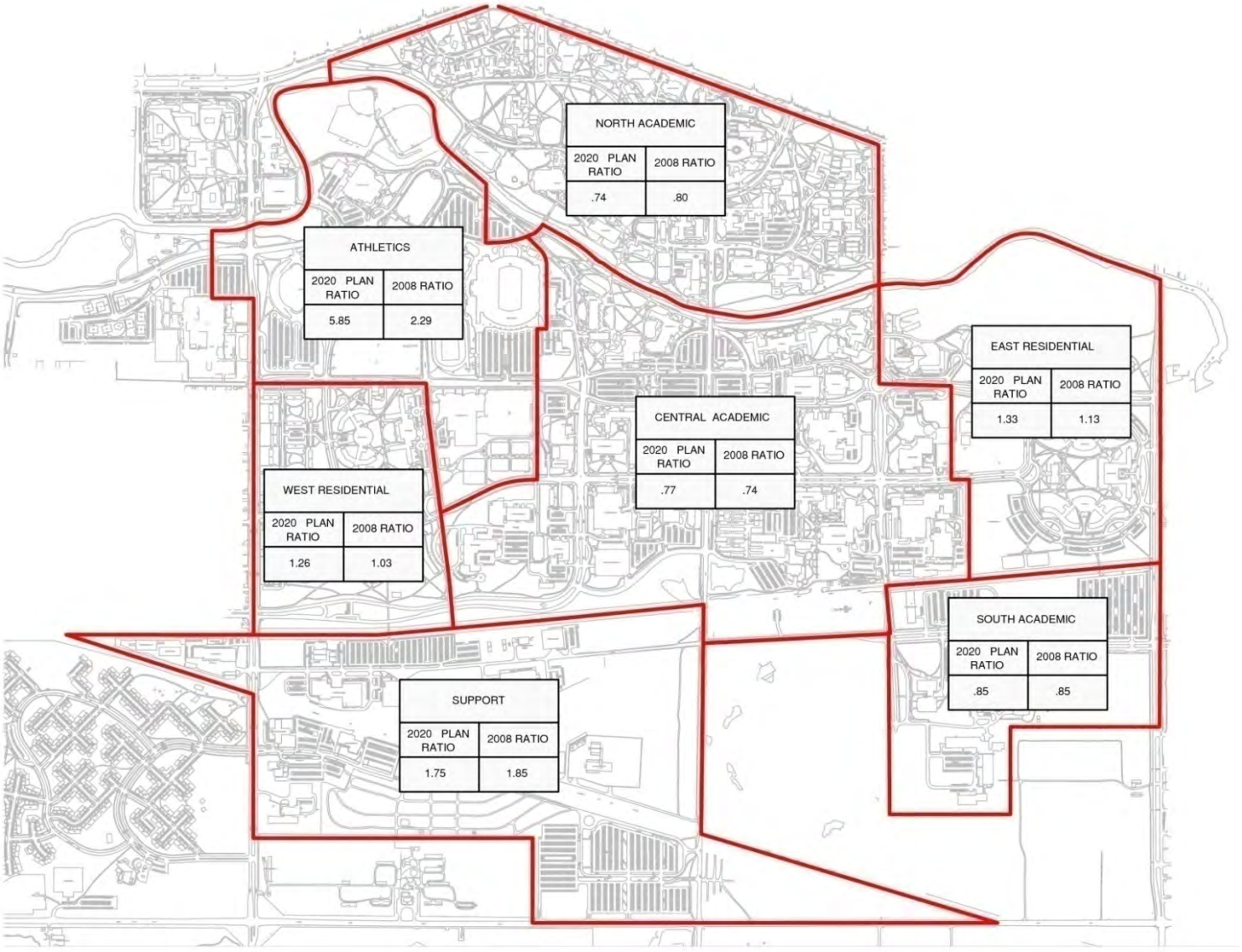


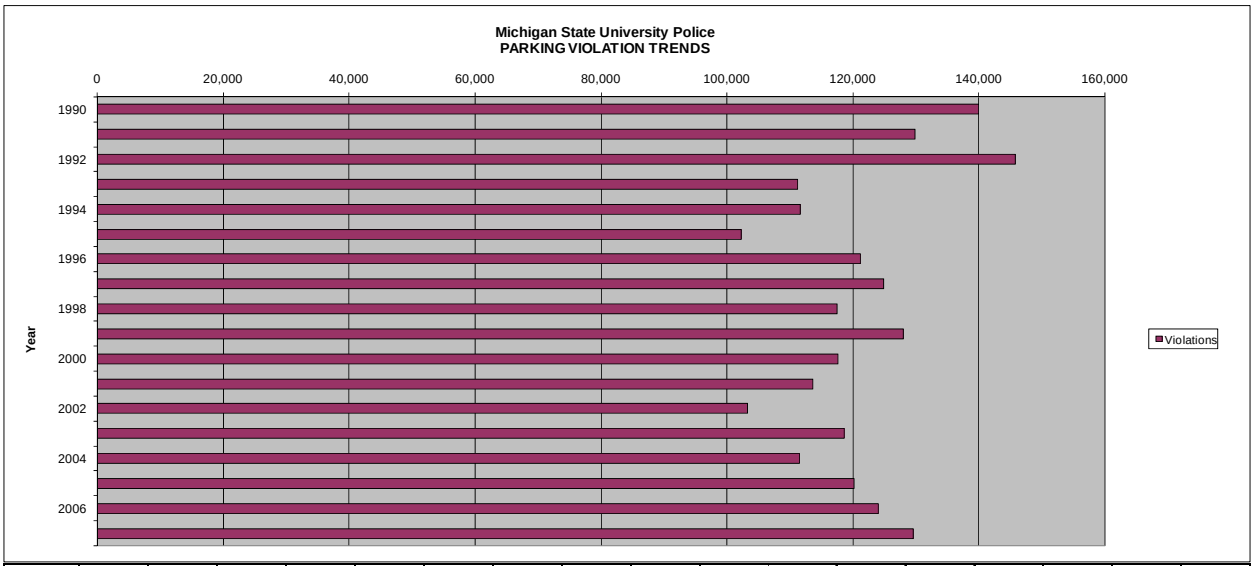
Figure 4. *Parking Ratio Comparison by Study Area*

The Athletic district experienced a notable decrease (5.85 to 2.29) in its parking ratio from the 2020 Plan to 2008. This may be attributed to a two factors. First, the population data in 2008 may have been more accurate because data was collected using a new zip code + 4 method. Additionally, there was an increase in the Athletic district population since 1999 due to new employees in the Spartan Stadium Tower and the Skandalaris Center.

Under the Just-in-Time methodology, the parking lots and ramps have been inventoried and categorized for future replacement, repair, or removal. The study confirms that the needs of the system eclipse the financial resources of the Parking Operations unit. Evaluation criteria for repair of the ramps and lots has been developed and implemented to assure the most appropriate use of funds.

Parking enforcement remains a necessary part of the control of MSU's parking resources and in recent years, have the seen the annual total hold above the 115,000 mark in spite of efforts to reduce it.

The number of parking citations issued every year depends upon a number of variables including the weather, the number of student parking enforcers available, construction projects, and to some extent economic conditions such as the cost of gasoline. All enforcement is done by MSU student employees returning a significant amount of the fines to the pockets of our own students. After other operational costs are deducted, the balance of the revenue is used for safety related issues in the community such as the green-light emergency phones, upgrading traffic signals and supporting the traffic engineering function in partnership with the College of Engineering. While the number of citations issued can be reduced by the installation of access card controlled gates, the cost of such gate equipment along with construction and maintenance costs makes such an effort cost prohibitive in smaller lots. Additionally, the cost of the fines, currently capped at $25.00 by State law, presents little deterrent for some violators.



Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Violations	139971	129885	145808	111222	111613	102211	121176	124869	117484	127932	117637	113681	103296	118572	111493	120135	124072

Figure 5. *Parking Violation Trends*

Future Directions

In the near future, the opening of the Farm Lane underpass project will present a unique opportunity to re-study and re-count the traffic flows of MSU. It is anticipated that such a

project will take up to two years and will provide the data to properly time and sequence the traffic light system on campus in order to provide for the most orderly and efficient traffic movement possible.

Reconstruction of the aging Bessey Parking ramp is currently in design. First put into service in the mid-sixties, the current ramp holds approximately 560 cars. Design goal for the new Bessey Ramp is 700 cars with a possible visitor section to better serve the outreach needs of the Hannah Administration Building. Additionally, traffic on the streets surrounding that area will be studied so that safety and congestion issues can be addressed as part of the Bessey Ramp project.

Transportation Services

Summary

Transportation Services (TS) is an auxiliary operation that provides vehicle transportation for the campus community with automobiles, trucks, buses and bicycles via leases, rental or charters, as well as procurement, licensing, maintenance, repair and disposal. The TS fleet is comprised of approximately 400 vehicles, 6 buses, and 1,000 bicycles. In support of MSU's commitment to the Chicago Climate Exchange, TS has taken several steps to reduce green house gases (GHGs) and fuel consumption on campus.

Transportation Services is creating a more fuel efficient fleet as vehicles are being replaced. Hybrids, flex fuel vehicles and an all-electric vehicle have been added to the fleet. (Figure 1) The fueling station has transitioned into dispending only bio-fuels, both diesel (B-5) and gasoline (E-10). TS also offers a full service bicycle center, MSU bikes, to promote biking as a more sustainable mode of transportation. MSU Bikes is the only center of its kind at a Midwest university.

Figure 1. *Examples of all-electric and hybrid vehicles*

Analysis

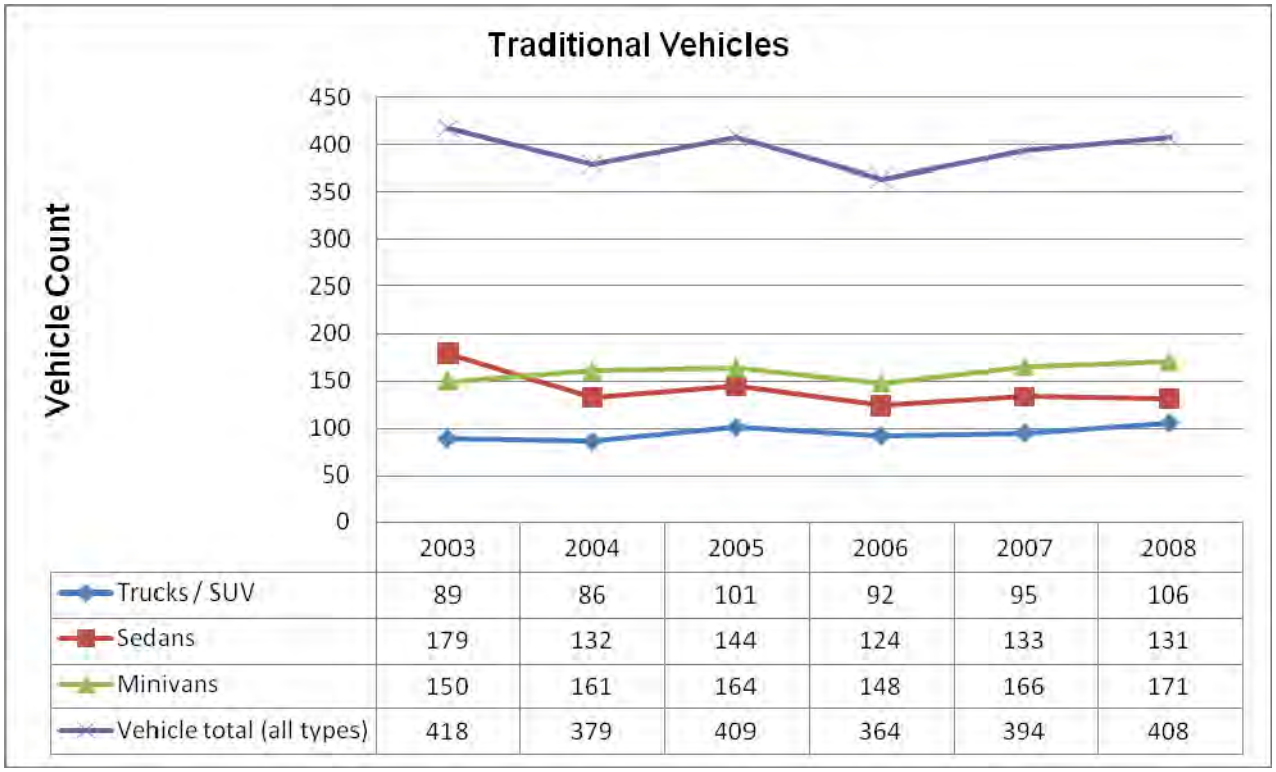
Transportation Services has been able to lower the overall number of motorized vehicles largely due to the introduction of an automated reservation system that allows better utilization of the fleet (see figure 2). Additional planned efforts in reducing fuel consumption include careful model selection such as the Chevrolet Impala that has a 21 city, 31 hwy, EPA MPG rating. The Ford Focus (24 city, 35 hwy, EPA MPG) was also added to the TS fleet to increase the number of fuel efficient compact sedans. The truck/SUV category increased by approximately 11% from FY07 to FY08. However this is attributed to vehicle replacement for MSU Police SUVs. New police vehicles were purchased in spring 2008. However, the old vehicles still remained in inventory until they could be decommissioned and sold to the public. As a result the FY08 figures reflect the newly purchased vehicles and old vehicles.

The percent of environmentally friendly vehicles (flex fuel, hybrid, and electric) in the fleet has increased from 7.4% in FY2003 to 30.8% in FY2008. Figure 3 shows the mix of environmentally friendly vehicles. Currently five percent of the fleet is made up of hybrid vehicles (combination electric and gasoline engine) which have overall MPG ratings in the mid 40's. Hybrid vehicles are popular among the campus community and are reserved weeks in advance. For a few years, the hybrid market primarily consisted of compact vehicles. However, as manufacturers release more hybrid options, TS can select hybrid vehicles that best meet the research and service needs for campus.

Flex fuel vehicles, vehicles that accept gasoline and E-85 (15% gasoline, 85% ethanol) fuel are the most common due to the availability from domestic auto manufacturers. The challenge is that the MSU fueling station does not dispense E-85 fuel, so those who use these vehicles only have access to E-85 off campus. Transportation Services exclusively uses biofuels, B-5 (5% biodiesel,

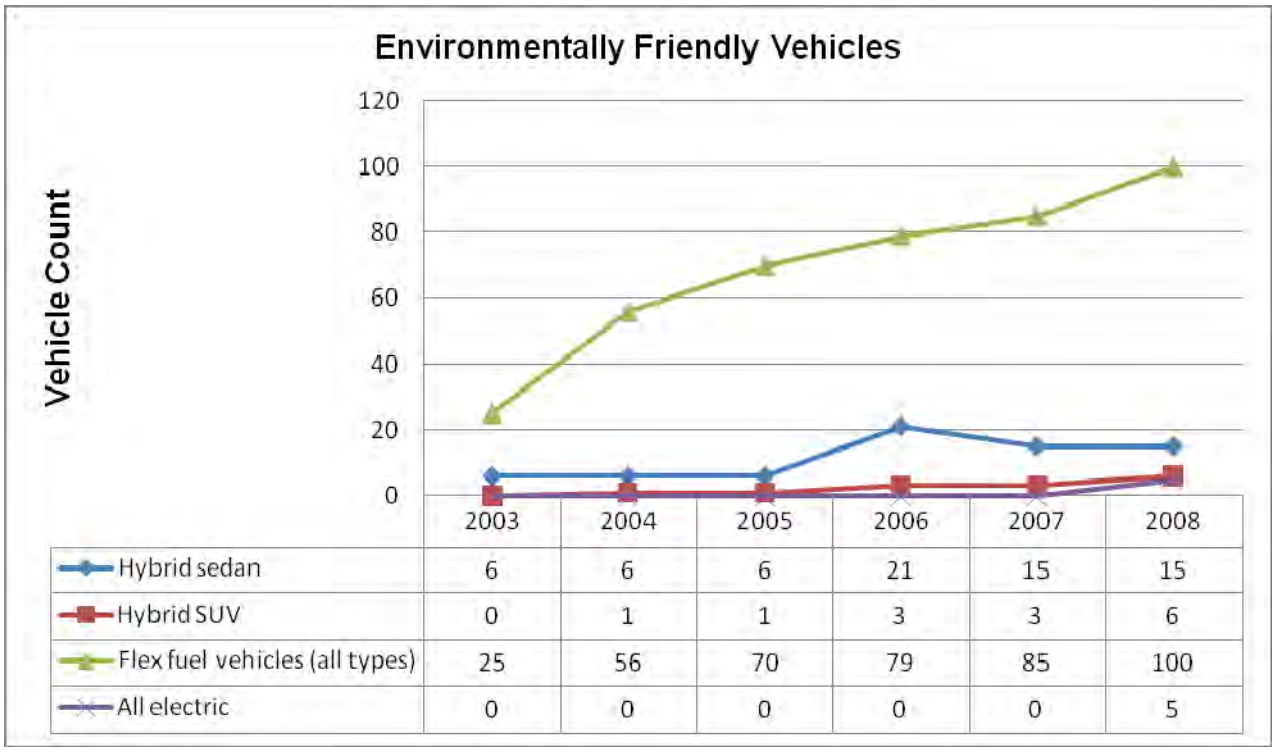
95% gasoline) and E-10 ethanol (10% ethanol, 90% gasoline) in its service station. B-5 is used for diesel vehicles such as buses, recycling and waste trucks, and other service vehicles. E-10 is approved for standard gasoline vehicles in the fleet.

The annual environmental benefit of dispensing only bio-fuels at TS's fueling station contributes to the Chicago Climate Exchange commitment to reduce green house gas emissions by 6% below the year 2000 baseline. Of the approximately 390,000 gallons of fuel pumped annually, the bio component (biodiesel and ethanol) makes up roughly 36,000 gallons, or 9% of the fuel.



	2003	2004	2005	2006	2007	2008
Trucks / SUV	89	86	101	92	95	106
Sedans	179	132	144	124	133	131
Minivans	150	161	164	148	166	171
Vehicle total (all types)	418	379	409	364	394	408

Figure 2. *Traditional Vehicles*



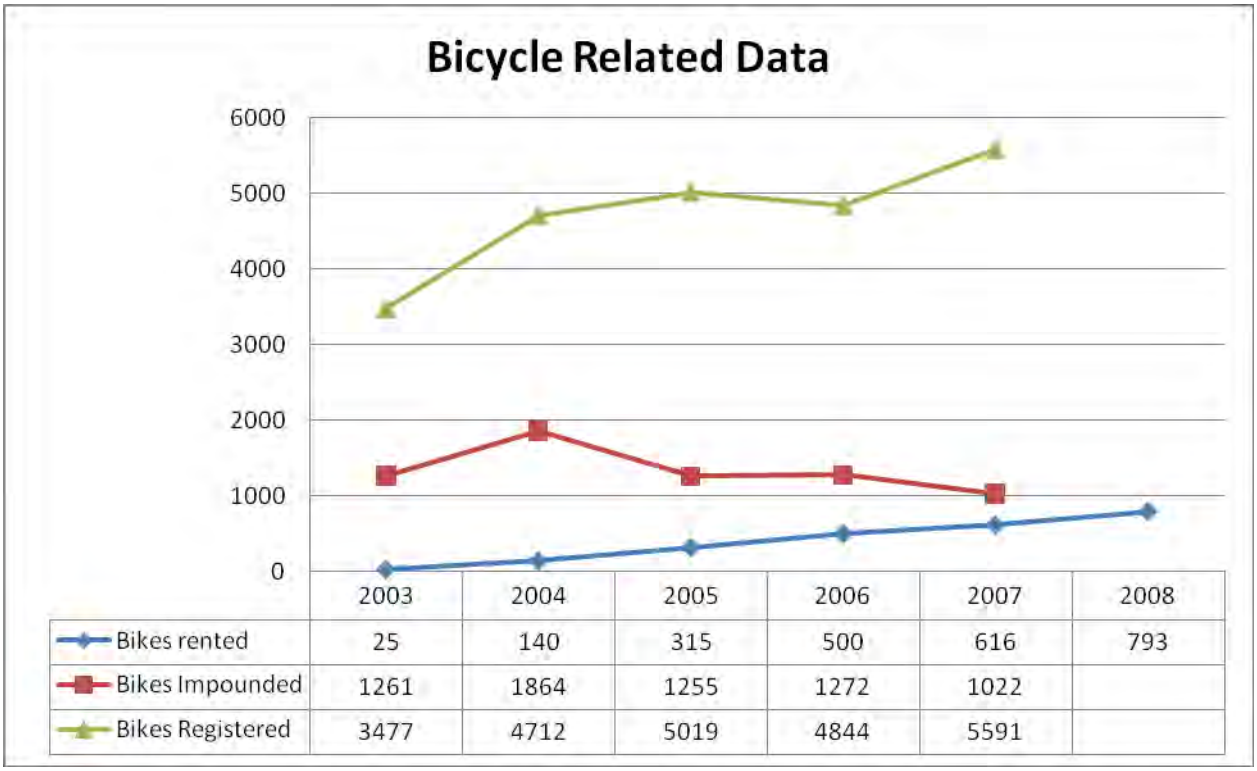
	2003	2004	2005	2006	2007	2008
Hybrid sedan	6	6	6	21	15	15
Hybrid SUV	0	1	1	3	3	6
Flex fuel vehicles (all types)	25	56	70	79	85	100
All electric	0	0	0	0	0	5

Figure 3. *Environmentally Friendly Vehicles*

With the launch of the volunteer-run MSU Bike Project in early 2003 campus, faculty and staff were introduced to the concept of having a recycled bike available for campus transportation. Due to the popularity and success of the Bike Project services, MSU Bikes was established in the summer of 2006 as a full-time campus service.

Bikes are donated or recovered, then repaired and inspected. Faculty, staff, students, or departments may lease or buy bikes and associated accessories at competitive rates. MSU Bikes provides bike safety information, facilitates bicycle registration and promotes community cycling.

In November 2008, MSU Bikes partnered with University of California – Davis to organize and host the 1st conference for Campus Bike Programmers in North America.



	2003	2004	2005	2006	2007	2008
Bikes rented	25	140	315	500	616	793
Bikes Impounded	1261	1864	1255	1272	1022	
Bikes Registered	3477	4712	5019	4844	5591	

Figure 4. *Bicycle related data showing the growth of bikes rented (cumulative) and fluctuations in bikes registered and impounded on campus (source: MSU Police Department).*

Figure 4 shows that since 2003, there has been a significant increase in the number of bikes registered. Since MSU Bikes was created in 2006, there was a 15% increase bike registrations. Additionally there has been a 23% increase in bikes rented and almost 20% decrease in bikes impounded. At this point, there has been no determination to see if bike rentals have resulted in fewer cars on campus.

Future Directions

Motor Pool Fleet

Four main factors influence motorized vehicle fleet replacement – market demand, supplier availability, cost and environmental factors/emissions. Transportation Services will continue to move forward with the goal to reduce the fleets' GHGs. Supplier availability will also influence timing for new vehicle orders. General market demand for fuel efficient vehicles has significantly increased. For example, MSU ordered 30 Ford Fusion hybrids in 2008. Ford moved up the order deadline for these vehicles by 6 months due to increased demand. Many manufacturers are trending toward earlier order due dates and longer lead times for efficient vehicles.

In addition, Transportation Services is challenged to keep up with rapidly changing technology. With long lead times, TS must make decisions today, knowing that by the time new vehicles are on campus, better technology may be available.

New technologies being considered are all-electric vehicles that can reach highway speed and other vehicles that support alternative fuels such as liquid propane. When the technology is

proven and available, TS will give evaluate and consider these vehicles to improve the environmental performance of the fleet.

Another future challenge is space. At this time Transportation Services is located in central campus next to Spartan Stadium and in close proximity to the Red Cedar River. This site limits the ability to expand the operation or increase fuel capacity. If TS wanted to expand its environmentally friendly fuel options such as E-85, it would not be possible due to the limitations of its location.

MSU Bikes

The significant growth of bicycles rented contributes to the CCX goals. However at peak periods the demand for rentals and convenient repair services has begun to exceed MSU Bikes' service capacity.

Figure 5. *Sparty with an MSU green bike*

While MSU Bikes remains committed to recycling abandoned bikes, research has shown another method for consideration. Augmenting the used rental fleet with sufficient numbers of new bikes, which can be ready for rent within 15 minutes vs. the 2 – 3 hours per abandoned bike. The new bikes can be rented for a year and then sold as used bikes, greatly helping to fill the demand gap (see figure 5 for an example of a classic rental bike). Maintenance costs (currently absorbed by MSU Bikes) during that first year will also be much lower than on the recycled/ abandoned bikes. Revenue from the sales of those used bikes would then be available to purchase more bikes for the following semester creating a self-funding pool.

As for the concern for physical space for keeping up with the growing fleet of bicycles of all types, MSU Bikes is exploring ways to both store and distribute bicycles around campus in a secure fashion. One such way, via lockable bike lockers (see figure 6) that are rented out either with or without a bike, could resolve the limited space constraints of the existing Center while also making the bikes more easily and conveniently accessible to the campus community. MSU Bikes is coordinating the exploration of such lockers for installation at key points on campus in the upcoming year.

Figure 6. *Typical bike locker; capacity for 2 bikes/unit. Four of these units occupy the space of 1 car parking space.*

Critical Space Needs

Due to the extended time over which Michigan State University has not received significant Capital Outlay support, a number of projects have reached a point of critical need. In late spring of 2008 the following projects were reviewed with the Board of Trustees: Plant Sciences Addition, Morrill Hall Replacement, and Life Sciences Nursing Addition. In the absence of Capital Outlay support in the near future, the university is prepared to fund these projects through commitment of a $2.2M allocation authorized by the Board of Trustees in the 2008-09 budget and an additional $2.2M which was discussed initially, but deferred until spring 2009. This allocation will be utilized to fund debt service for bond issues to address the identified critical space needs.

The critical space needs represent new space to support program expansion efforts, in particular in the research arena; address deteriorating facility conditions; and renovation of outmoded facilities. The following projects received Board of Trustees Step 1 Approval to Plan at the September and June 2008 meetings, respectively.

Current Projects

- Plant Sciences Addition estimated at $40.0M. Project funded internally in the absence of State Capital Outlay support. This project is in support of plant science initiatives, including the Great Lakes Bioeconomy Research Center.
- Morrill Hall Academic Replacement Space and Demolition estimated at $36.0M. Project funded internally in the absence of other funding opportunities. This project provides replacement space for units located in the existing structure that is deteriorating; allocates funding for demolition.
- Life Sciences A-wing Addition estimated at $16.0M. $4.0M will be provided from this allocation in partnership with $12.0M in private donor support. This project provides for the consolidation of the College of Nursing at the Life Sciences building.

Future Projects

The following is a list of potential future projects that may be considered for funding from this critical space allocation. They are illustrative of the programmatic need for facility improvements on campus (in alphabetical order).

Project	Estimated (Bond) Amount
Chittenden Hall Comprehensive Renovation	$5.0M
Data Center New Construction	$25.7M
Engineering Addition	$40.0M
Engineering Research Complex Addition	$21.8M
Erickson Hall Addition	$8.0M
Fairchild Theatre Renovation	$8.0M
Music Building Addition	$40.3M
Relocate Multicultural Center	$4.4M
Student Services Renovation	$20.8M

Because of the significance of the critical space need, both programmatically and financially, the list of potential projects will continue to be monitored and updated accordingly. The current and future needs will be informed by the following:

- Boldness By Design
- 2020 Vision Master Plan
- Fall Planning process that identifies programmatic based facility needs
- State of Michigan Capital Outlay planning process
- Coordination opportunities
- Development opportunities
- External factors such as the proposed federal economic stimulus package; accreditation.

Summary

In summary, because of the dynamic nature of the university and its programs the need for investment to address critical programmatic space needs will continue. This need is driven by such factors as expansion of capacity - quality and quantity; the age of facilities; accommodate changes in pedagogy; programmatic realignments; and increase efficiency.

Space Policy Implementation and Management

In the fall of 2007 the Council of Deans approved the adoption of a space assignment policy specifically addressing office and research space. Subsequently the Executive Committee for Buildings, Facilities and Space formally adopted the policy. The full policy is included in Appendix E. A key component necessary to support the implementation of the policies is the expansion of the university space inventory system. This is the system of record for location data of university facilities. The data is maintained in the Facilities Administration Management Information System (FAMIS) Space module.

The data contained in the FAMIS Space module follows the coding structure prescribed by the National Center for Education Statistics – Postsecondary Education Facilities Inventory and Classification Manual. This coding structure provides for:

- Organized and consistent set of data for tracking and reporting space allocations – current and historical
- Review, analysis, and planning of space
- Peer comparisons
- Negotiation of federal indirect cost recovery rates
- Participation in surveys, such as the National Science Foundation Science and Engineering Research Facilities biennial survey.

<u>Expansion of FAMIS Space Data Elements</u>

Expansion of the space data elements, as follows, is necessary to provide a comprehensive space inventory system. This system will facilitate the implementation of the space policies and enhance the planning, management and utilization of a significant campus resource – facilities. The enhanced system is necessary not only because of the space policy adoption, but also the following:

- Continued constraint of space and financial resources
- Aging facilities
- Institutional goal to increase research
- Changes in teaching and research environments, such as increased collaboration and emphasis on informal learning
- Facilities Planning and Space Management is in the early stages of development of expansion of the data elements. The current system contains the following elements:

Bldg.	Room No.	Square Feet	Major Admin. Unit by Common Unit Code	Major Admin. Unit	Department	Room Use Code	Room Use Code Desc.	Function (PCS) Code	Function Code Name	Function Percent
Admin.	337	136	90593	MSU Clsrm. Space	MSU Clsrm. Space	114	Classroom Technology Enhanced	1.0	Instruction	100

Future elements that will either be included within FAMIS or associated by a link to existing data residing in other systems include, but are not limited to the following:

- Room occupant name and employee identification number
- Position Type
- Position
- Full-time equivalent
- Research expenditures
- Research awards

These additional data elements will facilitate the development and use of metrics at the individual, department and major administrative unit level. Metrics such as research expenditures per square foot will assist with understanding utilization at the occupant level and allow for benchmarking. This type of enhanced space management is consistent with the office and research space policies referenced above.

Future System and Data Development

With recent upgrades to the new version of FAMIS, during January 2008, the following components will be reviewed and planned for implementation as appropriate.

- Develop web interface for on-line space inventory updates by major administrative units.
- Expand the system to include leased, farm, and off-campus properties to provide a comprehensive resource that represents the University real estate portfolio, regardless of location or ownership.
- Expand the system to capture data elements in support of contract and grant activity as it relates to space allocation and the negotiation of the federal indirect cost recovery rates.
- Mapping tool to provide for color-coding of small scale (floor plan) drawings. Intent is to have this available for major administrative units to aid in planning and management of space allocations by providing a visual tool.
- Scenario planning tool that would allow for “what if” planning. Facilitate development of various space planning scenarios using data in the space inventory system.

Public Art on Campus

In December 1999, the Michigan State University Board of Trustees (BOT) authorized the establishment of a standing committee to advance the presence of public art on campus. The committee is charged with making recommendations to the Provost and the Vice President for Finance and Operations regarding the acquisition, placement and maintenance of public art on the MSU campus.

The BOT authorization furthermore resolves that Michigan State University will dedicate ½ of 1% of the cost of major renovations or new buildings (excluding utility facilities) to public art in relation to the new construction or major renovation up to a maximum of $250,000. The dedicated funds may be handled in several ways including in priority order:

- Cash donations
- In-kind art contributions
- Assignment of art already owned by the university
- Specific allocation of university funds

Any remaining funds (difference between the budgeted amount and the amount required for purchase and installation) will go into a common campus art fund to support more costly art acquisitions or to acquire additional public artwork.

Since its inception the Public Art on Campus Committee (PAOCC) has guided the installation of 13 major pieces of outdoor sculpture, 26 paintings / photographs, and one interior hanging sculpture. In addition the PAOCC guided the installation of a bronze replica of *The Spartan*, and approved the installation of numerous pieces gifted to the university that meet the goal of providing high quality public art that enriches the learning environment, stimulates lively discussion, and evokes aesthetic appreciation of the MSU campus.

The following lists the pieces of art installed under the guidance of the Public Art on Campus Committee, the artist's name, and the location on campus. The pieces are listed in the order that they were installed on campus. Figure 1 provides their location on campus. Figure 1 displays their location on campus. More information about these works, including photographs, is included in Appendix F.

A. 26 various pieces	MSU faculty	Biomedical & Physical Sciences
B. John Hannah	Bruce Wolfe	Hannah Administration
C. The Spartan (Bronze)	Leonard Jungwirth	Demonstration Hall Field
D. BP-87	Caspar Henselmann	Biomedical & Physical Sciences
E. Collateral Damage	Joseph Mannino	Wells Hall
F. Cherished	Jonathan & Evelyn Clowes	Veterinary Oncology
G. Life's Lessons	George Lundeen	4-H Children's Garden
H. Pegasus	Avard Tennyson Fiarbanks	Pegasus Critical Care
I. Twyla	Bill Barrett	Grand River Parking Garage
J. Unity III	Charles McGee	Automotive & Energy Research
K. US 1-9	Caspar Henselmann	Erickson Hall
L. Gateway to Health	Doug DeLind	IM West
M. Sculptural Improvisation II	Richard Hunt	Chemistry
N. Thomas Jefferson	Bruce Wolfe	Radiology
O. Untitled	Russell Thayer	Biomedical & Physical Sciences

Figure 1. *Public Art on Campus Location Map*

Construction Management Report

Prepared for the Michigan State University Board of Trustees January 2009

The annual construction report as request by the Board of Trustees includes construction projects which have been completed and project accounts which have been closed. Major capital projects are those that are $1 million or greater and require Board approval. There are 14 Major Capital Projects that were closed and 23 Minor Capital Projects; of the 37 closed projects.

Minor capital project are greater than $250,000 and less than $1 million. The Board requests a listing of these projects on an annual basis. In addition to this annual report, the Board receives quarterly construction reports reflecting current and on-going construction projects.

The Closed Major Capital Projects Report highlights three areas for the fourteen major capital projects that were closed during the fiscal year 2007-08. These areas include authorized budget, final cost of the project, contingency use, data relative performance on the construction schedule, and change order management. The reports are utilized to provide timely and accurate project information, and report on our project performance in the aggregate, analyzing our strengths and weaknesses, and improving our processes.

The Closed Minor Capital Projects Report highlights final cost for the twenty-three minor capital projects that were closed during the fiscal year. A minor capital projects is any project with an authorized budget less than $1 Million and greater than $250,000. Since projects are closed, these are final costs.

The Capital Project Contractor Scorecard Report summarizes the evaluation of contractor performance completed at final payment to the general contractor or construction manager. Contractors are evaluated on several factors, including quality, schedule, cost, project management, and close out. Scores from 100 to 80 are considered good, 51 to 79 acceptable and 50 and below are unacceptable.

The Capital Project Owner Scorecard Report is completed by the general contractor or construction manager after MSU makes final payment. The report summarizes the owner performance on the project. MSU will be evaluated on several factors, including quality, schedule, cost, project management, and close out. Scores from 100 to 80 are considered good, 51 to 79 acceptable and 50 and below are unacceptable.

Closed Major Capital Projects
Fiscal Year 2007-08

Summary of Data

Fourteen major projects were closed during the fiscal year ending June 30, 2008. The approved budgets for the projects totaled $22,397,500. The final cost of these projects was $20,767,171 a difference of $1,630,329 (7.2%) that was returned to the appropriate unit.

Approximately 85% (twelve) of the closed projects were renovations that comprised a budget of $19.4 M slightly over 86% of the authorized budget for all major closed projects in fiscal year 2007–2008. Of the remaining two projects, one project was considered an Addition and the last project was categorized as New Construction; these projects had an authorized budget of approximately $3 M or 14% of the authorized budget.

The closed projects focused primarily on repairing or improving the university infrastructure. About 71% or ten of the fourteen closed projects were elevator, roof, roads, parking lots, site, or utility type work. The remaining four projects were in support of programming needs for the university. The projects that focused on programming needs for the university made up about 21% of the authorized budget or $4.5 M, while the infrastructure related projects comprised about 79% of the authorized budget or $17.8 M.

Analysis

When evaluating closed projects, the University focuses on quality, cost, & schedule. Historically, MSU has been very successful in meeting these goals. During fiscal year 2007 – 2008 MSU continues to meet schedule and budget targets on a regular basis. Of the closed major projects, 100% of projects were completed within budget and 85% or twelve of the fourteen projects reached substantial completion on schedule. Of the fourteen major closed projects in fiscal year 2007 – 2008, two projects or 14% met the final completion date. The fourteen projects took an average of 178 days longer than planned to meet the final completion date

When reading this report, some figures are reported as negative percentages. Some change orders result in credits to the university; for example soil conditions may be better than expected and require less engineered fill. Occasionally, the credit change orders are greater than additive, and the contractor budget will contribute to contingency rather than burden it, thus resulting in a negative percentage.

Future Focus

Measuring quality for a project has been somewhat of a challenge for MSU. We need a broader dataset to assess and improve the quality of construction services that are performed on campus. In past fiscal years, MSU has collected data focused on contractor performance; this effort will be expanded to collect data on all parties that are involved in making a construction project successful. MSU will utilize the data to measure quality of the construction services performed on campus and identify opportunities for improvements for internal university operations, contractors, and consultants.

In the coming fiscal year, the university will continue to utilize the School of Planning, Design, and Construction to review construction services performed on campus. A considerable amount of effort will be made to evaluate the performance of all stakeholders for a construction project with the goal of measuring quality, finding areas of improvement, communicating & implementing the improvements for future projects. MSU is organizing a formal Post Occupancy Evaluation (POE) program, which will measure these factors, and create a feedback loop to immediately address project problems, as well as a “lessons learned” catalog of experience for similar future work. It is hoped that this will upgrade the design and construction process, and create a stronger connection between delivering facilities and MSU’s success in providing education, conducting research, and advancing outreach.

Closed Major Capital Projects for Fiscal Year 2007 – 2008

CP03111 - I.M. SPORTS WEST - ADDITION NO. 1 - (COURTYARD INFILL)

Authorized Budget:	5,612,000	**Final Cost**	5,585,169	**Classification:**	Site
Construction:	4,263,419	**Returned**	26,831	**Delivery Method:**	Construction Manager
Professional Services:	407,300			**Contractor:**	BARTON MALOW/CLARK CONST.
Owner Work and Material:	485,953			**A/E:**	TMP
Contingency:	455,328				

Funds returned to: IM Sports

Change Orders		% of Contract	% of Contingency
Scope:	152,347	3.6%	33.5%
Document:	130,399	3.1%	28.6%
Field:	216,979	5.1%	47.7%
Total	499,725	11.7%	109.8%

Schedule	Planned	Actual	Days (Under)/Over
Substantial Completion:	1/15/2005	1/15/2005	0
Close Out:	8/15/2007	9/25/2007	41

CP05584 - ROADS - CRESCENT/MIDDLEVALE ROAD - PHASE 3

Authorized Budget:	2,300,000	**Final Cost**	1,764,805	**Classification:**	Roads & Parking Lots
Construction:	1,370,825	**Returned**	535,195	**Delivery Method:**	Design Bid Build
Professional Services:	229,200			**Contractor:**	SANDBORN CONSTRUCTION, INC.
Owner Work and Material:	46,864			**A/E:**	CTE ENGINEERS
Contingency:	653,111				

Funds returned to: Bond Funded

Change Orders		% of Contract	% of Contingency
Scope:	0	0.0%	0.0%
Document:	61,221	4.5%	9.4%
Field:	12,617	0.9%	1.9%
Total	73,837	5.4%	11.3%

Schedule	Planned	Actual	Days (Under)/Over
Substantial Completion:	8/13/2007	8/13/2007	0
Close Out:	3/31/2008	4/16/2008	16

CP02066 - COMMUNICATION DISTRIBUTION - FIBER OPTIC BACKBONE - PHASE X

Authorized Budget:	2,200,000	**Final Cost**	1,933,074
Construction:	1,107,000	**Returned**	266,926
Professional Services:	174,596		
Owner Work and Material:	479,475		
Contingency:	438,929		

Classification:	Steam & Underground Utilities
Delivery Method:	Design Bid Build
Contractor:	IRISH CONSTRUCTION COMPANY
A/E:	EAS
Funds returned to:	Physical Plant

Change Orders		**% of Contract**	**% of Contingency**
Scope:	52,628	4.8%	12.0%
Document:	0	0.0%	0.0%
Field:	10,170	0.9%	2.3%
Total	62,797	5.7%	14.3%

Schedule	**Planned**	**Actual**	**Days (Under) / Over**
Substantial Completion:	3/16/2004	3/16/2004	0
Close Out:	9/30/2004	10/2/2007	1097

Note: Close Out delayed by additional work required after contract completed.

CP05322 - NATURAL SCIENCE - NEW ELECTRICAL SUBSTATION

Authorized Budget:	1,600,000	**Final Cost**	1,574,864
Construction:	1,190,236	**Returned**	25,136
Professional Services:	169,091		
Owner Work and Material:	106,700		
Contingency:	133,973		

Classification:	Mechanical & Electrical Equipment
Delivery Method:	Design Bid Build
Contractor:	GRANGER CONSTRUCTION COMPANY
A/E:	ORION ENGINEERING CO.
Funds returned to:	Physical Plant

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	6,180	0.5%	4.6%
Field:	18,191	1.5%	13.6%
Total	24,371	2.0%	18.2%

Schedule	**Planned**	**Actual**	**Days (Under) / Over**
Substantial Completion:	4/27/2007	3/31/2007	(27)
Close Out:	9/29/2007	2/27/2008	151

CP04329 - FEE HALL - EAST - 6TH FLOOR RENOVATIONS (LAC)

Authorized Budget:	1,560,500	**Final Cost**	1,476,020
Construction:	858,000	**Returned**	84,480
Professional Services:	170,900		
Owner Work and Material:	298,700		
Contingency:	232,900		

Classification:	Program Space
Delivery Method:	Design Bid Build
Contractor:	MOORE TROSPER CONSTRUCTION
A/E:	DESIGN PLUS
Funds returned to:	Office of Planning & Budget

Change Orders		**% of Contract**	**% of Contingency**
Scope:	20,357	2.4%	8.7%
Document:	36,109	4.2%	15.5%
Field:	73,231	8.5%	31.4%
Total	129,696	15.1%	55.7%

Schedule	**Planned**	**Actual**	**Days (Under) / Over**
Substantial Completion:	5/30/2006	5/30/2006	0
Close Out:	3/30/2007	4/16/2008	383

Note: Close Out delayed by procurement of furnishings.

CP03358 - VETERINARY MEDICAL CENTER - BLDG. "F", CREATE 2ND FLOOR

Authorized Budget:	1,500,000	**Final Cost**	1,500,000
Construction:	1,170,000	**Returned**	0
Professional Services:	84,687		
Owner Work and Material:	158,552		
Contingency:	86,761		

Classification:	Program Space
Delivery Method:	Design Bid Build
Contractor:	IRISH CONSTRUCTION COMPANY
A/E:	TOWER PINKSTER TITUS
Funds returned to:	College of Veterinary Medicine

Change Orders		**% of Contract**	**% of Contingency**
Scope:	-70,102	-6.0%	-80.8%
Document:	44,289	3.8%	51.0%
Field:	32,953	2.8%	38.0%
Total	7,139	0.6%	8.2%

Schedule	**Planned**	**Actual**	**Days (Under) / Over**
Substantial Completion:	8/18/2006	8/18/2006	0
Close Out:	6/30/2008	4/16/2008	(75)

CP04373 - UNION BUILDING - ELEVATOR REPLACEMENT

Authorized Budget:	1,240,000	**Final Cost**	1,197,111
Construction:	1,035,000	**Returned**	42,889
Professional Services:	102,400		
Owner Work and Material:	4,000		
Contingency:	98,600		

Classification:	Elevators
Delivery Method:	Design Bid Build
Contractor:	KARES CONSTRUCTION COMPANY
A/E:	BERNATH - COAKLY ASSOC.
Funds returned to:	Housing & Food Services

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	23,640	2.3%	24.0%
Field:	20,292	2.0%	20.6%
Total	43,932	4.2%	44.6%

Schedule	**Planned**	**Actual**	**Days (Under)/Over**
Substantial Completion:	12/31/2006	12/31/2006	0
Close Out:	4/3/2008	2/27/2008	(36)

CP05450 - ROADS - CRESCENT/MIDDLEVALE ROAD RECONSTRUCTION-PHASE II

Authorized Budget:	1,100,000	**Final Cost**	856,313
Construction:	738,331	**Returned**	243,687
Professional Services:	150,210		
Owner Work and Material:	65,600		
Contingency:	145,859		

Classification:	Roads & Parking Lots
Delivery Method:	Design Bid Build
Contractor:	CAROL'S EXCAVATING, LLC
A/E:	CTE ENGINEERS
Funds returned to:	JIT Savings Reserve

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	7,985	1.1%	5.5%
Field:	-62,762	-8.5%	-43.0%
Total	-54,777	-7.4%	-37.6%

Schedule	**Planned**	**Actual**	**Days (Under)/Over**
Substantial Completion:	7/21/2006	7/21/2006	0
Close Out:	3/31/2008	4/16/2008	16

CP05576 - BESSEY HALL - REPLACE ABSORPTION MACHINE

Authorized Budget:	1,100,000	**Final Cost**	905,545
Construction:	769,000	**Returned**	194,455
Professional Services:	109,300		
Owner Work and Material:	100,000		
Contingency:	121,700		

Classification:	Mechanical & Electrical Equipment
Delivery Method:	Design Bid Build
Contractor:	NORTHERN BOILER MECHANICAL
A/E:	DICLEMENTE SIEGEL DESIGN
Funds returned to:	JIT Savings Reserve

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	0	0.0%	0.0%
Field:	0	0.0%	0.0%
Total	0	0.0%	0.0%

Schedule	**Planned**	**Actual**	**Days (Under)/Over**
Substantial Completion:	3/30/2007	4/27/2007	28
Close Out:	3/1/2008	4/15/2008	45

CP05132 - I.M. SPORTS WEST - ROOF REPLACEMENT

Authorized Budget:	1,060,000	**Final Cost**	1,040,350
Construction:	872,585	**Returned**	19,650
Professional Services:	82,061		
Owner Work and Material:	20,000		
Contingency:	85,354		

Classification:	Roofs
Delivery Method:	Design Bid Build
Contractor:	MID MICHIGAN ROOFING
A/E:	RTA/FTC&H
Funds returned to:	Office of Planning & Budgets

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	0	0.0%	0.0%
Field:	8,199	0.9%	9.6%
Total	8,199	0.9%	9.6%

Schedule	**Planned**	**Actual**	**Days (Under)/Over**
Substantial Completion:	8/1/2006	7/31/2006	(1)
Close Out:	3/31/2007	3/19/2008	354

CP06146 - STEAM DISTRIBUTION - NEW STEAM SERVICE FROM STM0180 TO UPLA BUILDING

Authorized Budget:	865,000	**Final Cost**	763,685
Construction:	628,000	**Returned**	101,315
Professional Services:	97,490		
Owner Work and Material:	20,000		
Contingency:	119,510		

Classification:	Steam & Underground Utilities		
Delivery Method:	Design Bid Build		
Contractor:	KARES CONSTRUCTION COMPANY		
A/E:	FTCH		
Funds returned to:	Physical Plant		

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	8,291	1.3%	6.9%
Field:	42,165	6.7%	35.3%
Total	50,455	8.0%	42.2%

Schedule	**Planned**	**Actual**	**Days (Under) / Over**
Substantial Completion:	12/31/2006	12/31/2006	0
Close Out:	6/15/2007	9/5/2007	82

CP05485 - SPARTAN STADIUM - LEVEL 200 - CAREER SERVICES BUILD OUT

Authorized Budget:	810,000	**Final Cost**	743,317
Construction:	514,000	**Returned**	66,683
Professional Services:	110,100		
Owner Work and Material:	110,000		
Contingency:	75,900		

Classification:	Program Space
Delivery Method:	Design Bid Build
Contractor:	CHRISTMAN CONSTRUCTORS, INC.
A/E:	HNTB
Funds returned to:	Academic Student Services & Multicultural Issues

Change Orders		**% of Contract**	**% of Contingency**
Scope:	4,058	0.8%	5.3%
Document:	13,752	2.7%	18.1%
Field:	8,330	1.6%	11.0%
Total	26,140	5.1%	34.4%

Schedule	**Planned**	**Actual**	**Days (Under) / Over**
Substantial Completion:	5/12/2006	5/4/2006	(8)
Close Out:	5/10/2007	12/27/2007	231

CP04253 - CLINICAL CENTER - ELEVATOR JACKS REPLACEMENT

Authorized Budget:	725,000	**Final Cost**	716,910
Construction:	519,890	**Returned**	8,090
Professional Services:	55,900		
Owner Work and Material:	0		
Contingency:	149,210		

Classification:	Elevators
Delivery Method:	Design Bid Build
Contractor:	NIELSEN COMMERCIAL CONST. CO.
A/E:	EAS
Funds returned to:	Physical Plant

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	0	0.0%	0.0%
Field:	140,139	27.0%	93.9%
Total	140,139	27.0%	93.9%

Schedule	**Planned**	**Actual**	**Days (Under)/Over**
Substantial Completion:	12/15/2006	12/12/2006	(3)
Close Out:	4/1/2007	8/23/2007	144

CP05022 - ENGINEERING RESEARCH COMPLEX - RENOVATE CLEANROOM C16E

Authorized Budget:	725,000	**Final Cost**	710,009
Construction:	568,888	**Returned**	14,991
Professional Services:	108,836		
Owner Work and Material:	645		
Contingency:	46,631		

Classification:	Program Space
Delivery Method:	Design Bid Build
Contractor:	MOORE TROSPER CONSTRUCTION
A/E:	FISHBESK, THOMSON & FCTH
Funds returned to:	Office of Planning & Budgets

Change Orders		**% of Contract**	**% of Contingency**
Scope:	0	0.0%	0.0%
Document:	-7,412	-1.3%	-15.9%
Field:	7,368	1.3%	15.8%
Total	-44	0.0%	-0.1%

Schedule	**Planned**	**Actual**	**Days (Under)/Over**
Substantial Completion:	5/31/2006	8/10/2006	71
Close Out:	9/30/2007	11/18/2007	49

Closed Minor Capital Projects
Fiscal Year 2007-2008

Summary of Data

Twenty-three minor projects were closed during the fiscal year ending June 30, 2008. The approved budgets for the projects totaled $12,383,100. The final cost of these projects was $11,525,707 a difference of $857,393 (6.9%) that was returned to the appropriate unit. All of the closed minor projects were renovations. Similar to the major closed projects the minor closed projects focused primarily on repairing or improving the university infrastructure. About 83% or nineteen of the twenty-three closed projects were elevator, roof, roads, parking lots, site, or utility type work. The remaining four projects were in support of programming needs for the university. The projects that focused on programming needs for the university made up about 21% of the authorized budget or $2.5 M, while the infrastructure related projects comprised about 79% of the authorized budget or $9.9 M.

CP Number	Project Description	Budget	Final Costs	Returned
CP06145	STEAM DISTRIBUTION - NEW STEAM SERVICE FROM STM0002 TO BESSEY HALL	980,000	903,748	76,252
CP06526	OLD HORTICULTURE - BENEFACTORS PLAZA	920,000	860,449	59,551
CP06019	KELLOGG CENTER - ELEVATOR REPLACEMENT	880,000	786,505	93,495
CP06143	STEAM DISTRIBUTION - STM0212 - LAUNDRY (2007)	875,000	834,543	40,457
CP05170	NATURAL SCIENCE - ALTERATIONS TO ROOMS 25, 34, 210, & 202	711,000	711,000	0
CP05587	FEE HALL - EXTERIOR MASONRY FACADE REPAIRS PHASES 3 AND 4	710,000	709,986	14
CP035002	PARKING - LOTS 23/24 RECONSTRUCTION	684,000	559,521	124,479
CP06178	SPARTAN VILLAGE/CHERRY LANE - ROOF REPLACEMENT, SP. VLG. 1410 - 1640, CHERRY LN. 807 - 815	640,000	566,379	73,621
CP04252	ENGINEERING BUILDING - FIRE ALARM UPGRADE	600,000	556,725	43,275
CP04247	PUBLIC SAFETY - REPLACE DX AIR CONDITIONING WITH CHILLER	525,000	461,420	63,580
CP06118	CLINICAL CENTER - RENOVATION TO ROOM D117 (.7T MAGNET)	524,600	530,519	-5,919
CP05577	GROUNDS HEADQUARTERS - ROOM 150 AND HVAC MODIFICATIONS	509,000	490,630	18,370

CP Number	Project Description	Budget	Final Costs	Returned
CP06090	HOLMES HALL - ROOF REPLACMENT AREAS 10, 11, 16 & 17	460,000	429,637	30,363
CP05578	I.M. SPORTS WEST - EXTERIOR RESTORATIONS	425,500	420,176	5,324
CP04028	DEMONSTRATION HALL - REPLACE PIPING IN CRAWL SPACE	420,000	413,622	6,378
CP06505	SPARTAN VILLAGE ELEMENTARY SCHOOL - ROOF REPLACEMENT	400,000	395,546	4,454
CP05582	T.B. SIMON POWER PLANT - ELEVATOR REPLACEMENT	360,000	342,383	17,617
CP05638	BERKEY HALL - REPLACEMENT OF TRACTION ELEVATOR	330,000	292,154	37,846
CP06049	GROUNDS HEADQUARTERS - ROOF REPLACEMENT AREAS 1, 2, 3, AND 4	305,000	270,178	34,822
CP05639	COMPUTER CENTER - ELEVATOR REPLACEMENT	300,000	275,504	24,496
CP07113	ROADS - AUDITORIUM RD/BOGUE STREET - NEW INTERSECTION - 2007	300,000	193,925	106,075
CP04254	VETERINARY MEDICAL CENTER - REPLACE AHU CONTROLS ON 15 FANS WITH HEAT EXCHANGERS	264,000	259,099	4,901
CP04234	NORTH CAMPUS SUBSTATION - REPLACE HOUSE SERVICE TO SUBSTATION	260,000	262,058	-2,058
	Projects: 23	**12,383,100**	**11,525,707**	**857,393**

Capital Project Contractor Score Card Report

Summary of Data

During the past fiscal year, there were fifty-two projects that received final payment in which a contractor score card was completed. The contractor performance was rated good for 11% or six projects, acceptable for 67% or thirty-five projects, and unacceptable for the 21% or eleven projects.

Analysis

The average contractor score for the fifty-two projects that were scored this fiscal year is 64.8, down over two points compared to last year's average score of 67.0, and a 4 point fall compared to fiscal year 2005-2006. Although the average score has declined, overall unacceptable contractor performance has declined.

Since the inception of the contractor score card, almost one hundred and fifty contractor score cards have been completed for 49 different contractors or construction managers. Some contractors have only been rated once while others have been rated several times, thirteen contractors have been rated three times or more. There are six contractors or 12% that have a performance rating of good, 73% or 36 of the rated contractors have scores that are acceptable, and there are 14% or 7 contractors whose performance have been rated unacceptable.

Future Focus

This report is intended to be a feedback tool. Contractors generally like working at MSU, and want to meet the university's expectations. This is an opportunity to identify opportunities for improvements. The Construction Superintendent has reviewed low scores with the contractors to create better performance in the future. As additional projects are evaluated this tool may aid in the selection of contractors for future projects.

The report is comprised of 5 factors: Quality, Schedule, Cost, Project Management, & Final Completion (Close-out). The score for each factor is weighted and is summarized into an overall ranking. In addition to the overall ranking, each factor is ranked for each project. Moreover, the score for each factor is reported under the ranking and is color coded for each project: A green colored score indicates the contractor scored at least 80% of the total possible points for that factor, a yellow score means that the contractor scored between 51% and 79% of the total possible points, and a red score indicates that the contractor scored 50% or less of the total possible points.

Quality factor makes up 25% of the overall score and focuses on three items. First, timely closure of items designated for re-work, avoiding negative impact on MSU operations, and ensuring workmanship and materials meet MSU standards.

Scheduling comprises 20% of the overall ranking and centers around four elements: Performance against owner milestones, utilizing acceptable scheduling practices when establishing schedules and milestones, submitting required schedule reports – keeping MSU informed of schedule issues, and coordinating trade activities.

Cost makes up the third factor and provides for 20% of the overall ranking. Cost is evaluated by determining how changes to a project are estimated by the contractor and charged to MSU. Additionally, are changes identified in a timely manner to minimize the impact to MSU in terms of cost and time?

Project Management is the fourth element and provides 20% of the overall ranking, it focuses on the following: coordinating resources effectively, completing change requests and submittals timely, participation in design reviews – responding to MSU needs in a fair and timely manner, being vested in the project and contributing to the successful completion of the project.

Contractor close-out is the last factor that is measured and makes up 15% of the overall score and focuses on completing the punch list timely and accurately, submitting all drawings and documentation as required, and honoring warranties for materials and workmanship.

Capital Project Contractor Score Card Report

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100% (Good) 51 to 79% (Acceptable) Below 51% (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP05172 - ENGINEERING BUILDING - ALTERATIONS TO ROOM B205		1	89.3	4	21.9	1	18.6	4	18.5	2	19.0	5	11.3
CP06537 - BESSEY HALL - ALTERATIONS TO ROOM 204		2	88.6	6	20.6	4	17.8	1	20.0	2	19.0	5	11.3
CP05170 - NATURAL SCIENCE - ALTERATIONS TO ROOMS 25, 34, 210, & 202		3	88.6	5	21.6	7	16.8	1	20.0	2	19.0	5	11.3
CP03422 - ENGINEERING RESEARCH COMPLEX - ADDITION NO. 2 - ENERGY & AUTOMOTIVE RESEARCH FACILITY		4	85.0	22	17.5	2	18.3	1	20.0	5	18.0	5	11.3
CP06181 - FARRALL HALL - ALTERATIONS TO ROOMS 3 AND 129*		5	84.4	16	18.1	4	17.8	5	18.0	1	20.0	32	10.5
CP05022 - ENGINEERING RESEARCH COMPLEX - RENOVATE CLEANROOM C16E		6	80.9	1	24.1	8	16.1	31	13.0	7	16.5	5	11.3
CP06019 - KELLOGG CENTER - ELEVATOR REPLACEMENT		7	79.9	11	19.4	2	18.3	7	15.0	8	16.0	5	11.3

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100 % (Good) 51 to 79 % (Acceptable) Below 51 % (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP05583 - FOOD SCIENCE - ELEVATOR REPLACEMENT		8	79.3	13	18.8	12	15.0	7	15.0	6	17.0	1	13.5
CP06090 - HOLMES HALL - ROOF REPLACMENT AREAS 10, 11, 16 & 17		9	78.9	11	19.4	6	17.3	7	15.0	8	16.0	5	11.3
CP05249 - UNIVERSITY VILLAGE APARTMENTS - CONSTRUCT NEW APARTMENTS (DEMOLISH OLD)		10	78.6	2	23.1	24	13.3	7	15.0	8	16.0	5	11.3
CP06146 - STEAM DISTRIBUTION - NEW STEAM SERVICE FROM STM0180 TO UPLA BUILDING		11	77.2	3	22.8	29	12.3	7	15.0	14	15.5	4	11.6
CP06048 - JENISON FIELDHOUSE - ROOF REPLACEMENT AREAS 1 THRU 7 AND 9 THRU 17		12	76.9	6	20.6	12	15.0	7	15.0	17	15.0	5	11.3
CP06311 - HANNAH ADMINISTRATION BUILDING - EXTERIOR RESTORATION		12	76.9	6	20.6	12	15.0	7	15.0	17	15.0	5	11.3
CP03358 - VETERINARY MEDICAL CENTER - BLDG. "F", CREATE 2ND FLOOR		14	75.0	13	18.8	12	15.0	7	15.0	17	15.0	5	11.3

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100 % (Good) 51 to 79 % (Acceptable) Below 51 % (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP07048 - GEOGRAPHY BUILDING - ALTERATIONS TO ROOM 121		14	75.0	13	18.8	12	15.0	7	15.0	17	15.0	5	11.3
CP07009 - ROADS - ABBOT ENTRANCE/W CIRCLE DR RECONSTRUCTION 2007		16	74.9	9	20.0	10	15.6	24	14.0	14	15.5	34	9.8
CP06272 - FEE HALL - WEST - ALTERATIONS TO SUITES 324-327 & 3RD FLOOR CORRIDOR		17	74.6	18	17.8	27	12.8	6	16.0	8	16.0	3	12.0
CP05638 - BERKEY HALL - REPLACEMENT OF TRACTION ELEVATOR		18	74.5	22	17.5	9	15.8	24	14.0	8	16.0	5	11.3
CP04131 - HOLMES HALL - LYMAN BRIGGS SCHOOL - HVAC MODIFICATIONS & LAB RENOVATIONS		19	74.1	18	17.8	12	15.0	7	15.0	17	15.0	5	11.3
CP06049 - GROUNDS HEADQUARTERS - ROOF REPLACEMENT AREAS 1, 2, 3, AND 4		20	73.7	10	19.7	27	12.8	7	15.0	17	15.0	5	11.3
CP06186 - PARKING - LOT 100 EXPANSION		21	72.6	24	16.9	21	14.0	7	15.0	14	15.5	5	11.3

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100% (Good) 51 to 79% (Acceptable) Below 51% (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP06526 - OLD HORTICULTURE - BENEFACTORS PLAZA		22	72.1	18	17.8	12	15.0	24	14.0	31	14.0	5	11.3
CP06102 - WILSON HALL - REPLACE AIR CONDITIONING IN SPECIAL DINING ROOM		23	70.4	29	15.6	11	15.4	7	15.0	17	15.0	37	9.4
CP06178 - SPARTAN VILLAGE/CHERRY LANE - ROOF REPLACEMENT, SP. VLG. 1410 - 1640, CHERRY LN. 807 - 815		24	70.1	16	18.1	33	11.8	7	15.0	31	14.0	5	11.3
CP05223 - ENGINEERING BUILDING - REPLACE COMPUTER ROOM AIR CONDITIONING UNITS		25	69.4	35	13.1	12	15.0	7	15.0	17	15.0	5	11.3
CP05339 - NATURAL RESOURCES - ALTERATIONS TO LAB 201		25	69.4	35	13.1	12	15.0	7	15.0	17	15.0	5	11.3
CP06091 - MUSIC PRACTICE BUILDING - ALTERATIONS TO ROOM 100		27	69.1	32	14.4	23	13.6	29	13.5	29	14.5	2	13.1
CP07113 - ROADS - AUDITORIUM RD/BOGUE STREET - NEW INTERSECTION - 2007		28	68.5	27	16.3	21	14.0	24	14.0	29	14.5	34	9.8

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100 % (Good) 51 to 79 % (Acceptable) Below 51 % (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP04078 - FARRALL HALL - ALTERATIONS TO ROOM 112 & 131		29	66.4	24	16.9	24	13.3	31	13.0	37	12.0	5	11.3
CP05613 - MUSIC BUILDING - EXTERIOR PAINT		30	63.9	37	12.2	29	12.3	24	14.0	17	15.0	32	10.5
CP06197 - FARRALL HALL - ALTERATIONS TO ROOMS 100, 101 & 230		31	62.9	38	10.6	32	12.0	7	15.0	31	14.0	5	11.3
CP06143 - STEAM DISTRIBUTION - STM0212 - LAUNDRY (2007)		32	60.4	41	9.4	36	11.3	29	13.5	17	15.0	5	11.3
CP06446 - I.M. SPORTS EAST - IRRIGATION WELL		33	60.3	42	8.8	36	11.3	31	13.0	8	16.0	5	11.3
CP04385 - ERICKSON HALL - ADDITION 3		34	58.6	24	16.9	36	11.3	36	12.0	40	11.0	39	7.5
CP06092 - ROADS - WILSON ROAD - RECONSTRUCTION 2007 - PHASE II		35	57.8	30	15.0	39	10.5	36	12.0	17	15.0	49	5.3
CP06505 - SPARTAN VILLAGE ELEMENTARY SCHOOL - ROOF REPLACEMENT		36	57.5	27	16.3	47	9.0	36	12.0	48	9.0	5	11.3
CP02076 - VETERINARY MEDICAL CENTER - ONCOLOGY ADDITION		37	57.3	18	17.8	47	9.0	40	10.0	34	13.0	39	7.5

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100% (Good) 51 to 79% (Acceptable) Below 51% (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP06082 - COMMUNICATION ARTS & SCIENCES - ALTERATIONS TO ROOMS 29 AND 30		38	54.3	42	8.8	26	13.0	36	12.0	34	13.0	39	7.5
CP06197 - FARRALL HALL - ALTERATIONS TO ROOMS 100, 101 & 230		39	53.0	42	8.8	33	11.8	31	13.0	37	12.0	39	7.5
CP05584 - ROADS - CRESCENT/MIDDLEVALE ROAD - PHASE 3		40	51.9	32	14.4	40	10.0	40	10.0	41	10.0	39	7.5
CP04360 - FOOD STORES - RELOCATE MSU BAKERY		40	51.9	32	14.4	40	10.0	40	10.0	41	10.0	39	7.5
CP05582 - T.B. SIMON POWER PLANT - ELEVATOR REPLACEMENT		42	51.3	39	10.0	40	10.0	40	10.0	41	10.0	5	11.3
CP06473 - PSYCHOLOGY BUILDING - ALTERATIONS TO SUITE 136		43	47.9	47	6.9	29	12.3	49	7.0	37	12.0	34	9.8
CP05587 - FEE HALL - EXTERIOR MASONRY FACADE REPAIRS PHASES 3 AND 4		44	47.5	39	10.0	40	10.0	40	10.0	41	10.0	39	7.5
CP06179 - MANLY MILES - ALTERATIONS TO ROOMS 203 & 204		44	47.5	48	6.3	40	10.0	40	10.0	41	10.0	5	11.3
CP05639 - COMPUTER CENTER - ELEVATOR REPLACEMENT		46	46.3	30	15.0	35	11.5	49	7.0	48	9.0	51	3.8

	Legend	Overall (100)		Quality (25)		Schedule (20)		Cost (20)		Project Management (20)		Close Out (15)	
CP Project Name	80 to 100% (Good) 51 to 79% (Acceptable) Below 51% (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP05639 - COMPUTER CENTER - ELEVATOR REPLACEMENT		46	46.3	30	15.0	35	11.5	49	7.0	48	9.0	51	3.8
CP05640 - ANGELL UNIVERSITY SERVICES BUILDING - ALTERATIONS TO MAIN LOBBY, ROOMS 101, 101A, 101D, 10		46	46.3	42	8.8	40	10.0	40	10.0	41	10.0	39	7.5
CP07092 - UNION BUILDING - FOOD COURT RENOVATIONS		46	46.3	42	8.8	40	10.0	40	10.0	41	10.0	39	7.5
CP04441 - I.M. SPORTS WEST - ALTERATIONS TO ROOMS 130/130A, 142/142C & ROOMS 136 & 140		49	46.1	51	5.0	51	6.5	31	13.0	34	13.0	38	8.6
CP04030 - JENISON FIELDHOUSE - INDOOR POOL MODIFICATIONS		50	34.8	48	6.3	49	8.5	51	5.0	48	9.0	48	6.0
CP06087 - GILTNER HALL - ALTERATIONS TO ROOMS 100, 100A, 157, 158, 158A		51	31.5	48	6.3	50	8.0	48	8.0	52	4.0	49	5.3
CP05400 - MANLY MILES - ALTERATIONS TO ROOMS 107 & 115		52	20.6	52	1.9	52	5.0	51	5.0	51	5.0	51	3.8
Total Projects: 52			**64.8**		**15.0**		**12.9**		**13.3**		**13.7**		**9.9**

Capital Project Owner Score Card Completed by Contractor

Summary of Data

The owner evaluation by contractor is a new process that has recently been introduced. MSU has asked contractors to provide feedback to MSU in how MSU performs as an owner. The goal is to identify University shortcomings and make improvements so that MSU is considered a preferred customer for contractors and construction managers that perform work on campus. Participation by contractors has been sporadic, since October MSU has asked to be rated on 36 projects and have received sixteen evaluations from contractors.

Analysis

Based on the completed score cards at this time, the owner performance was rated good for 75% or twelve projects, acceptable for 12.5% or two projects, and unacceptable for 12.5% or two projects. The average score for the owner score card is 86.7. According to the contractors MSU makes payments within thirty-four days, however, there seems to be a significant gap between the fastest payment time of 19 days and the longest payment time of 80 days. Although we know MSU has opportunities for improvement, at this point, there is not enough data to identify any clear trends.

Future Focus

MSU wants to be the owner of choice for Contractors and Construction Managers. This is a tool to help identify opportunities for improvement and open communication with contractors. The University wants to be fair with contractors and construction managers, but at the same time be vigorous in protecting MSU assets. Furthermore, the new project management database will enable MSU to collect and measure various attributes about a project such as the duration from when a contractor submits a payment application to when a check is created.

The report is comprised of 5 factors: Quality, Schedule, Cost, Project Management, & Final Completion (Close-out). The score for each factor is weighted and is summarized into an overall ranking. In addition to the overall ranking, each factor is ranked for each project. Moreover, the score for each factor is reported under the ranking and is color coded for each project: A green colored score indicates the contractor scored at least 80% of the total possible points for that factor, a yellow score means that the contractor scored between 51% and 79% of the total possible points, and a red score indicates that the contractor scored 50% or less of the total possible points.

Quality factor makes up 25% of the overall score and focuses on three items. First, timely closure of items designated for re-work, avoiding negative impact on MSU operations, and ensuring workmanship and materials meet MSU standards.

Scheduling comprises 15% of the overall ranking and centers around four elements: Performance against owner milestones, utilizing acceptable scheduling practices when establishing schedules and milestones, submitting required schedule reports – keeping MSU informed of schedule issues, and coordinating trade activities.

Cost makes up the third factor and provides for 25% of the overall ranking. Cost is evaluated by determining how changes to a project are estimated by the contractor and charged to MSU. Additionally, are changes identified in a timely manner to minimize the impact to MSU in terms of cost and time?

Project Management is the fourth element and provides 25% of the overall ranking, it focuses on the following: coordinating resources effectively, completing change requests and submittals timely, participation in design reviews – responding to MSU needs in a fair and timely manner, being vested in the project and contributing to the successful completion of the project.

Contractor close-out is the last factor that is measured and makes up 10% of the overall score and focuses on completing the punch list timely and accurately, submitting all drawings and documentation as required, and honoring warranties for materials and workmanship.

Capital Project Owner Score Card Completed by Contractor

	Legend	Overall (100)		Quality (25)		Schedule (15)		Cost (25)		Project Management (25)		Close Out (10)	
CP Project Name	80 to 100% (Good) 51 to 79% (Acceptable) Below 51% (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP06124 - Steam Distribution-Vault 213 Structural and Piping Repairs		1	96.8	3	23.5	4	14.5	2	23.8	1	25.0	1	10.0
CP06036 - Administration Bldg Alter To 4th Floor		1	96.8	3	23.5	5	14.3	1	25.0	1	25.0	6	9.0
CP06092 - Roads - Wilson Raod - Reconstruction 2007 - Phase II		3	94.0	3	23.5	1	15.0	10	20.5	1	25.0	1	10.0
CP05249 - University Village New Apartments		4	92.0	1	25.0	1	15.0	11	20.0	4	23.8	9	8.3
CP05582 - T.B. Simon Power Plant-Elevator Replacement		5	89.8	11	20.3	6	13.3	4	23.3	4	23.8	5	9.3
CP05322 - Natural Science - New Electric Substation		6	88.8	8	21.5	1	15.0	12	19.8	6	22.5	1	10.0
CP05022 - Engineering Research Complex-Renovate Cleanroom C16E		7	87.0	8	21.5	9	12.0	2	23.8	12	21.3	7	8.5

	Legend	Overall (100)		Quality (25)		Schedule (15)		Cost (25)		Project Management (25)		Close Out (10)	
CP Project Name	80 to 100% (Good) 51 to 79% (Acceptable) Below 51% (Unacceptable)	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points	Rank	Points
CP04253 - Clinical Center-Elevator Jacks Replacement		8	84.3	2	24.5	12	10.8	7	20.8	15	20.0	9	8.3
CP05047 - Chemistry-Alterations to Room 511		9	82.8	12	18.8	8	12.5	7	20.8	6	22.5	9	8.3
CP06526 - Old Horticulture-Benefactors Plaza		9	82.8	10	20.5	11	11.5	6	21.3	12	21.3	9	8.3
CP05577 - Grounds Headquarters Room 150 and HVAC Modifications		11	80.8	12	18.8	6	13.3	7	20.8	6	22.5	17	5.5
CP04459 - Munn Ice Arena-Replace Roof		12	80.0	7	22.0	16	9.3	13	19.3	12	21.3	9	8.3
CP06178 - Spartan Village/Cherry Lane-Roof Replacement, SP. VLG 1410-1640, Cherry LN. 807-815		13	79.0	3	23.5	13	10.0	14	18.0	15	20.0	14	7.5
CP06112 - Communication Arts & Sciences-Elevator Replacement		13	79.0	16	14.3	10	11.8	5	22.0	6	22.5	7	8.5
CP05382 - Steam Distribution-New Steam Tunnel from STM0237 to STM0169 (Shaw Lane) and Road Replacement		15	39.8	15	10.0	12	8.8	11	8.0	14	7.0	15	6.0

	Legend	Overall (100)		Quality (25)		Schedule (15)		Cost (25)		Project Management (25)		Close Out (10)	
CP Project Name	**80 to 100% (Good)** **51 to 79% (Acceptable)** **Below 51% (Unacceptable)**	**Rank**	**Points**	**Rank**	**Points**	**Rank**	**Points**	**Rank**	**Points**	**Rank**	**Points**	**Rank**	**Points**
CP05323 - Steam Distribution-New Steam Tunnel from STM0229 to STM0268 (Bogue Street)		16	34.6	13	11.9	14	6.0	14	7.0	16	6.0	17	3.8
Average Score for all Projects Scored: 16		**86.68**		**21.50**		**12.71**		**21.34**		**22.59**		**8.54**	

School of Planning Design & Construction
Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Organizational Commitment			
Establish an organizational goal of a maximum aggregate change order rate not to exceed 6% of initial contract price annually. This represents an overall reduction of 25% over current averages.	Change Order rates have stayed at approximately 7.5% for past 4 years. Still work to do to complete this.	Ongoing	Trend of decreased change orders, particularly for documents errors and scope changes.
Adopt time-related goals for small items, routine change orders or those directed by construction change directive (CCD). A goal of 45 days for the D1 time is suggested.	Skire Unifier requires timelines for all interim steps in a business process. Total University processing time on a Change order, from bulletin or CCD to execution, is to be 34 days. Alerts will be sent to management if any document is held up an excessive amount of time.	Complete	Reduced Change Order Processing Time.
Establish a goal for the D2 sub-processes of 45 days for complex change orders or for scope adjustments.	Implemented in FAMIS via reporting and follow up by CPA, where CPA staff checks on lingering change requests. Will be more automated in Skire Unifier, with delinquent changes automatically shared with management	Complete	Reports and Discoverer queries in place for FAMIS. As projects move into Skire, alerts will be in place.

Appendix B: School of Planning Design & Construction Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Reducing Scope Increases			
Reduce *pre-construction* project contingencies.	Rejected: This concept conflicts with goal of budget certainty for customer, and allowing the project program be established. It should be noted that staff members are building construction budgets, including contingencies, more carefully. EAS has developed a detailed budget builder work sheet to account for project costs. This allows the contingency to enter construction unencumbered by soft costs, and set at a lower level if appropriate to the risk of the project.	Not Applicable.	Not Applicable.
Create policies for when unused contingency can be used for scope increases.	This effectively exists now, though there should be some discussion about when scope changes are prudent. May want to consider modest amount of scope change allowable, particularly on smaller and fast track projects where programming may not have been as extensive.	Complete	Customer Satisfaction with projects
Encourage more time be spent by the consultant in explaining the design to the end-user.	EAS has instructed design staff to build review time into the delivery requirements of the project. It is important to note that sometimes	Ongoing	Customer Satisfaction with projects and reduced scope changes.

Appendix B: School of Planning Design & Construction Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Reducing Field Changes			
Increased testing and field investigation could help.	Project Design Representative reviews soil boring & field investigation with AE. New contract implemented since study projects requires a field investigation plan.	Ongoing	Reduction of field condition changes, but not elimination. The report noted that there is no one broad recommendation which can be made from the database.
There is some indication that plans of existing older buildings may not be accurate, so increased field measurement and documentation of existing conditions might be appropriate	Design contract implemented since study projects requires a field investigation plan. Also, Skilled Trades staff assigned to construction group available to perform field investigations, including punching holes in ceilings and wall for investigation (November 2008).	Ongoing	Reduction of field condition changes.
Increased soils investigation could help particularly for projects which may use deep foundation systems or have known fill areas.	Poor soil conditions continue to be a challenge for projects. Project Manager and designer have discretion and responsibility to request soil borings and tests.	Ongoing	Reduction of field condition changes.
Reducing Document Errors			
Use plan review and coordination policies and practices as a selection factor for selecting design firms.	Updated standard Design Professional Request For Qualifications.	Complete	Design firms that continue to work with MSU should be able to demonstrate more successful review and coordination practices.

Appendix B: School of Planning Design & Construction Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Additionally, require a senior officer of those firms to certify that the protocols have been followed prior to release of documents for bidding	Update AE agreement	Complete	
Construction managers should also be able to respond to how they prevent and manage change orders.	Updated standard Construction Manager Request For Qualifications.	Complete	CM firms that continue to work with MSU should be able to demonstrate more successful review and coordination practices.
Track performance of design and construction firms with respect to change orders	Annual FAMIS Reports track design change orders by Design Professional. It should be part of a more comprehensive Design Professional evaluation process.	Complete	
Specific recommendations for MSU plan review			
Define plan review protocols	Skilled Trades Staff are the key to design review process. Currently assigned to review all projects put out for bid.	Complete	It doesn't appear that the reviews have reduced change orders, but they have identified improvements to the project. Note that the inspectors have submitted hundreds of design comments on projects.
Conclusions on Reducing Change Order Processing Times			
Define plan review protocols which are suitable for projects based on complexity and size.	Plan Review is now driven by the skilled trade staff, in consultation with the design representative.	Ongoing	Reduced document change orders.
Recommendations from SPDC	**CPA & EAS Response**	**Status**	**Measurement of Success**

Hold periodic work/training sessions addressing known problem areas	Design and Construction staffs regularly review problems in staff meetings to share experience with peers.	Ongoing	Reduced document change orders.
Elevate plan review as a priority	EAS has dedicated staff to design review.	Complete	Reduced document change orders.
Provide ample time for university personnel to review plans and specifications.	Projects have been delayed to allow sufficient review time, though this is not perfect (See Snyder Phillips as an example).	Complete	Reduced document change orders.
Consider adding one FTE to EAS for conducting plan review.	Accomplished Separately. EAS has retained several skilled trades staff to serve as field inspectors and design reviewers	Complete	Reduced document change orders.
Require that documents prepared by outside design consultants be complete and received sufficiently in advance of the date for release of documents for bidding to provide adequate time for review.	Design Professional Agreement has been updated	Complete	
7. Focus plan reviews on the following key areas: Coordination of structural, mechanical and electrical plans with architectural plans ⬧ Mechanical Systems ⬧ Electrical Systems ⬧ Site & Concrete	Checklist has been updated	Complete	reduction of change orders from these disciplines.

Appendix B: School of Planning Design & Construction Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Reducing Processing Time			
Set time goals for sub-process.	See Above. Durations set for all activities, with automatic reporting for delinquencies. Since Skire is a collaborative system involving designer and contractor as users, delays are visible to all.	Complete	Reduction in Change order processing times.
Reduce layers of approvals for small change order items	Change order process was examined during implementation into Skire Unifier. Signature authority delegated to Phys Plant for change orders below $25,000.	Complete	Reduction in Change order processing times.
Delegate signature authority	Signature authority delegated to Phys Plant for change orders below $25,000.	Complete	Reduction in Change order processing times.
Create reporting notification on Change Orders to inform VPFO	Skire will include reports for Senior Management on changes approved. In no event will change orders be processed that cause a project to exceed the budget with appropriate authorization.	Ongoing	Reduction in Change order processing times.
Issue late notices for delayed CO items	Currently monitored by Campus Planning and Administration. Review aging Bulletins and Construction Change Directives with project representative. Skire will automatically inform management of delayed tasks, but implementation for construction only beginning.	Ongoing	Reduction in Change order processing times.

Appendix B: School of Planning Design & Construction Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Limit the number of items in a change order.	In place. Single item change orders are the norm	Complete	Reduction in Change order processing times.
Consider putting scope changes in separate change orders to facilitate processing of the other items.	Incorporated in recommendation above. All changes are single items.	Complete	Reduction in Change order processing times.
Adopt project management software such as Prolog or Expedition for tracking change orders and other project documents.	MSU in the process of implementing Skire Unifier, an integrated project management system. Contractors and design professionals are also users of the system. Change order process developed, and in use for projects released for bids after November 1, 2008.	Ongoing	Reduction in Change order processing times.
Use specific alternates during bidding to obtain competitive pricing prior to contract execution for possible scope changes.	Rejected: We don't think we get good value on alternates. Better choice is timely decisions on changes.	Not Applicable.	Not Applicable.
Consider a graduated percentage overhead and markup provision for change orders. MSU may want to evaluate Minnesota change order provisions for use on MSU contracts.	Rejected: Reviewed with contractors who work with MSU (specifically Clark Construction), and they did not see the value, in part because mark up doesn't cover cost now.	Not Applicable.	Not Applicable.
Eliminate or reduce the use of allowances on general contracts or keep allowances on the project ledger but don't assign them to the contract.	Rejected: This appears to be immaterial impact on contract, and could effectively slow up change orders by adding to volume.	Not Applicable.	Not Applicable.

Appendix B: School of Planning Design & Construction Change Order Study Recommendations

Recommendations from SPDC	CPA & EAS Response	Status	Measurement of Success
Extend bidding periods, by perhaps one extra week to allow for more interaction during bidding between bidders, the university and design professional.	Projects schedules include reasonable bidding periods. Reasonable requests to extend bidding are considered.	Ongoing	More pre-bid questions and clarifications that avoid change orders.
Make Pre-bid mandatory	Reviewed with each project. More projects have mandatory pre-bids than previously. Bidders held to know information now, but can do this.	Ongoing	Reduced change orders and claims from information made available during bidding.

Summary of Phase II Recommendations

PLANNING

1. Long – range environmental stewardship plan

Create a long-range environmental stewardship plan to proactively manage the impact and risk to the University as it relates to global climate change and the changing regulatory landscape.

2. Strategic outreach plan

Develop a strategic communication outreach plan to position Michigan State University as a significant leader in environmental stewardship.

WASTE REDUCTION

3. Construction and Demolition Recycling Data

All major construction and demolition contracts should require the contractor to track data in a consistent manner with regard to the amount of material recycled and/or reused, where the material was recycled, the amount of material sent to the landfill and the revenue generated from the recycled material.

4. Reduce Unsolicited Paper Mailings

Explore ways to meet communication needs while reducing materials and energy costs associated with unsolicited paper mailings at Michigan State University.

5. Building profile research for niche recycling

Expand materials building profile research to examine niche opportunities for campus recycling.

6. Enhance visual flow and signage at loading docks

Enhance flow and signage of loading docks so places to recycling materials for recycling materials are more visible.

7. Scrap metal study

Develop a plan to study the potential to expand the current scrap metal collection program in specific building types.

8. Phase II of a Comprehensive Recycling Program for campus.

Begin Phase II of the comprehensive recycling plan which will focus on the collection of spent toner cartridges, paperboard/boxboard, plastics, and uncontaminated household metals.

INPUTS

9. Environmentally friendly packaging options

Reduce inputs to the MSU campus by developing and incorporating environmentally friendly packaging terms and conditions into supplier agreements.

10. Develop input metrics for the Enterprise Business System Project

Work with the Enterprise Business System Project (EBSP) Enterprise Information Systems (EIS) Team to develop and recommend options for capturing data within the EBSP using Business Intelligence tools to both identify and measure campus inputs for purchased products and some services such as travel where there is an environmental impact.

11. Purchasing Energy Star Products

Begin an aggressive awareness and procurement campaign to encourage the campus to purchase Energy Star equipment and appliances when available.

WATER CONSERVATION

12. Water Conservation from Fixture Replacement

Survey existing restroom facilities in major buildings and develop a plan for cost-effective water conservation from accelerated fixture replacement based on the research studies.

ENERGY REDUCTION & CARBON MANAGEMENT

13. Prioritize LEED energy criteria for new construction and renovation.

Review & prioritize LEED points that achieve LEED certifiable standards by emphasizing energy criteria for construction and renovation projects.

14. Energy Analyst

Establish a full time energy analyst position; duties to include:

1. Analyze heating, ventilating and air conditioning equipment (HVAC), central plant and control system data for faults, discrepancies, suboptimal operation, and energy saving opportunities.
2. Provide on-going analysis of the results of energy changes across campus.
3. Interface with building environmental stewards to provide detailed HVAC information regarding their buildings
4. Coordinate with the retro-commissioning team as they perform site surveys in campus buildings
5. Provide in-house continuous commissioning service through Central Control that is currently under contract.

15. Utility billing system for all departments on campus.

A feasibility study should be conducted to determine various methods and potential cost effectiveness for a utility billing system for facility users (e.g. units and departments).

16. Future Power Generation

Initiate a study regarding future power generation for Michigan State University main campus and MSU research and extension facilities. The study should include investigating new “best of breed” technologies including carbon sequestration, carbon scrubbers, distributed generation, renewable generation and a reliability and life cycle cost analysis to determine optimal power configuration and technology for each scenario.

17. Data base manager for campus tree plantings

Identify a full-time data base manager for Campus Planning and Administration's (CPA's) campus tree plantings database.

18. No net loss of campus green space

MSU should have no net loss of campus plantings and continue to protect, enhance and expand campus green spaces. New green spaces should be indentified on the master plan along with the development of a campus landscape plan.

19. Inventory / Identify carbon offset potential from off-campus properties.

Inventory and identify carbon offset potential from off-campus properties.

20. Transportation Data Enhancements

Identify and develop key metrics for enhanced data analysis for transportation.

21. Engine Idling Awareness

Implement an education and awareness campaign to reduce engine idling of vehicles.

COMMUNICATION & EDUCATION

22. Environmental stewardship education module for first year students

Develop and implement a mandatory environmental stewardship education module for all incoming MSU first year and transfer students.

23. Campus Energy and Material Waste Reduction Goals and Feedback

Set and broadly communicate clear long term goals for carbon emissions, energy reduction and waste. These goals should be coupled with regular reliable feedback on progress towards the goals to faculty, staff and students.

The Environmental stewardship goals should be to reduce landfill waste by 30%, reduce energy (electrical and steam) by 15% and reduce greenhouse gas emissions by 15% by 2015.

24. Environmental stewardship education module for new hires

Create an energy conservation and waste reduction education module for all new employees. This module would introduce the university's commitment toward environmental stewardship.

Energy and Environmental Projects

1. **Bio-Mass Fuel** – Wood Staging Study complete, permit to burn wood verified, expect to begin burning wood on a consistent basis in unit 4 in the spring of 2009. Permission to plan bio-mass facility.

2. **Building Utilization/Classroom Consolidation** – Implemented in January 2008, reductions made in 6 of 8 target buildings, continue to identify areas of consolidation.

3. **Retro-Commissioning** – Employed team to perform retro-commissioning of existing buildings with a focus on energy savings. Erickson Hall and International Center baseline data has been collected.

4. **Owner Commissioning of New Facilities** – Employed an in house commissioning group to provide a consistent method of commissioning new facilities; reduce overall construction costs; eliminate duplication of effort during construction; optimize building operation in order to ensure the design intent is met with regard to energy savings; ensure we meet energy achievements of LEED criteria including energy savings goals.

5. **Food Science –** Installed air quality system in a select number of labs to monitor air quality and during unoccupied periods reduce the number of air changes per hour in the lab. Reducing the amount of air that is cooled or heated, along with fan speed reductions based on reduced air flows will save energy.

6. **Chemistry Building** – Classroom labs on first floor have been programmed through central control to reduce the number of air changes per hour based on occupancy to reduce energy consumption.

7. **Pavilion** – High bay fluorescent fixtures have been tested in the animal preparation area

8. **Central Control** – Installed DDC controls and connect Manly Miles and Nisbet building to Central Control to reduce operating hours of equipment and conserve energy.

9. **Lighting Controls** – Continue to evaluate and identify areas that occupancy sensors or photo cell control would apply in existing facilities. Retrofit those areas that would lend themselves to control, examples are Business College and Wells Hall.

10. **New Technology or Equipment** – Evaluate and identify opportunities to install new technology or equipment that will conserve energy or provide renewable resources. - Example partnering with the College of Engineering to study composite materials used in manufacturing of wind turbines, also to study the aspects of recycling glass for use in concrete, and to study new types of cooling processes such as Dr. Mueller's water chiller. Partnering with the School of Planning and Construction Design to model buildings on campus with regard to energy use.

11. **Campus Metering** – Upgrade existing meters in buildings to include real time data accessible to campus users to encourage energy conservation and behavioral changes is in progress**.**

Updated 1-29-09

12. **Wells Hall** – Installation of Chemical Free Water Treatment trial for Cooling Towers to reduce make up water consumption and reduce chemical use.

13. **Physical Plant** – Installation of cork flooring as a renewable resource product to determine maintenance and wear

14. **Physical Plant** – Installation of LED lighting in corridor of tunnel between wings to reduce energy.

15. **Spartan Village** – Installation of LED walkway lighting to reduce energy consumption.

16. **Manly Miles** – Installation of recycled content carpet tiles in the Center for Systems Integration and Sustainability.

17. **Biomedical Physical Science and Administration Building** – Pilot change in custodial cleaning practices to reduce the number of lights required on in the buildings during unoccupied hours. Teams of custodians to sweep floor by floor and turn off lights, close windows as they complete a floor and move to the next level.

18. **Chemistry Building Addition** – Installation of recycled glass flooring in the new lobby north entrance.

19. **Physical Plant Custodial** – Green cleaning product use is maximized and green cleaning practices are part of the educational process and culture of the custodial staff.

20. **Physical Plant - MILES** – All electric vehicles being tested in Landscape Services and Telecommunications.

Michigan State University
Space Assignment Policy

Specifically Addressing Office and Research Space

Revised*: October 2007*

I. Preamble: Policy Statement on the Assignment of Space[1]

All Michigan State University buildings, space, and land, regardless of fund source or location, belong to the University as a whole and are subject to assignment and reassignment by the Provost to meet the overall needs and best interest of the institution. Long-range planning for optimum use of these valuable University assets is a continuing process.

The assignment and use of space must change with University priorities. This may include space currently and traditionally held by academic units. Policies and procedures that guide space assignment and reassignment are the responsibility of the Executive Committee on Buildings, Facilities, and Space (ECBFS). Unless otherwise specified by the Provost or the Vice President for Finance and Operations, space assigned to a College/MAU, whether in a single building or multiple facilities, may be reassigned or reallocated within and among internal units of the College/MAU by the College/MAU to meet its goals and purposes. Any assignment of space between or among Colleges/MAUs is subject to prior approval by the Office of Planning and Budgets/Facilities Planning and Space Management, and may necessitate action by the ECBFS.

II. Introduction

Among the many resources needed to accomplish the mission of a university, facility resources, particularly the allocation of space, are critical. Similar to other essential components such as personnel, financial support, and equipment, it is recognized that space is finite and that the creation of new space is a slow and expensive process that is not always possible. Therefore decisions regarding space need to be made within the context of utilizing existing resources in the most effective manner possible. As a result, the assignment and reallocation of space needs to be accomplished thoughtfully and in accordance with policies and criteria that meet the needs of the units' current and future mission and programs. The decision making process needs to take into account the special needs and unique differences among academic units and colleges. With this understanding, the following policy has been developed for space utilization at Michigan State University.

[1] *This is an excerpt from the Facilities Planning and Space Management Policy and Procedures document.*

The following is intended to be consistent with and follow from other all-campus policies[2] regarding the assignment of space. Furthermore, these policies and the following assignment criteria are intended to:

1. Acknowledge that space is a limited resource that should be considered an integral component in program planning-similar to resource issues of budget, personnel, and equipment.

2. Recognize the special space and facility support needs of each academic unit and college.

3. Promote stewardship and accountability for space assigned to the relevant academic units and colleges.

4. Promote a process that:

   - Is open and consistently implemented across all colleges.
   - Provides for the efficient distribution of space within and across colleges and a process for resolving conflicting interests both expeditiously and fairly.
   - Produces recommendations based on an objective assessment of need, accepted measures of productivity, and the priorities of the unit, college, and university.

5. Promote long-range strategic space planning that cuts across unit and college boundaries with reviews to occur at 3 year intervals. It is expected that space allocations within academic units are evaluated on an annual basis as part of regular review procedures. As one potential outcome of the review, changes in space assignments should be forwarded to FPSM for updating the university space inventory database.

6. Provide for space allocation committees that recognize the updated role of cross-collegiate deliberations in implementing policies and space allocation criteria noted below. A set of space allocation committees may be appointed both within and among the colleges. Within-college committees may include representatives from each of the units in a college, and be appointed by the dean. Cross-college committee(s) may be established to recommend space allocation across a group of facilities that are shared by multiple colleges. For example, the Health Colleges Space Committee oversees space assignments in Fee Hall, Life Sciences, Clinical Center "B" Building, and the Veterinary Medicine Complex. Other cross-college committees may be established to oversee other groups of facilities. Cross-college committees should have a representative from each college that shares space in the designated group of facilities, to be appointed by the relevant deans. The across-college

[2] *The all-campus policies can be found in FPSM – University Policies and Procedures Resource Guide, April 29, 1997 also located on the Web at Http://www.msu.edu/dig/opb/sm.*

committee(s) should include a representative from the Vice President for Research, and a representative from the Provost's Office: Facilities Planning and Space Management. Representatives should understand and be capable of representing the particular and specific unit and college space needs, and be able to develop and assess unit-specific productivity criteria.

7. In addition to the standing committees noted above, *ad hoc committees* also may be established in cases that require special attention to focused space issues.

8. The Office of the Registrar retains responsibility for the assignment of all instructional space, although some space assignment may be delegated to academic units.

III. Policies

1. The University operates in a dynamic environment. To be successful, it must be able to use its resources flexibly to not only create change, but also adapt to it. It is recognized that space, particularly research and studio space, cannot be assigned permanently, or for an indefinite period of time to any one individual, program, unit, or college. Space may require reallocation based on need, productivity, or when the priorities of the unit, college, and/or university change. The Provost retains the authority to assign space for new University initiatives which may be thematic and cross-unit, consistent with University priorities. At the same time, it is recognized that the physical movement of facilities can be costly, time consuming, and disruptive. University policies should require sufficient due diligence to ensure that reassignments are undertaken only when fully justified.

2. The relevant dean, unless otherwise specified by the Provost, has the authority to assign and to reassign space that is currently occupied and assigned to the college among its internal units to meet the programmatic plans of the college.

3. For units and programs that are jointly administered, space may be reassigned across major administrative units with the unanimous agreement of the relevant deans or the deans' designees. In these matters, the lead college has the responsibility to facilitate the resolution of space issues relative to the unit.

4. Program and personnel planning must make explicit the implications for space assignment. Program creation, growth, or contraction, must include a component that identifies a space plan. Similarly, all personnel hiring and contract and grant decisions require a space plan approved in advance of the offer with arrangements for space to be available when the offer, contract, or

grant is implemented.[3] Primary responsibility for these provisions rests with the lead dean(s) associated with the project, and with the department chairs of the associated units.

5. The college or major administrative unit designee for space will review all assigned space assigned for research and creative endeavors, inclusive of jointly-administered space, at least every 3 years. A consistent process across units for reassessing need and renewing the assignment will be put in place based on the criteria that follow in this document. It is expected that unit administrators conduct regular annual reviews of space allocation within their respective administrative units, and make appropriate alterations in allocation of space consistent with this policy. Changes in space assignments should be forwarded to FPSM for updating the university space database.

6. Requests for space need to consider the financial resources and the trajectory of growth that each faculty member's program brings to the unit/university. At a minimum, each college will establish a set of criteria for research and studio space assignment that includes some combination of indicators listed in Section IVB (Research and Related Support Space). In addition, each college may develop a more complex hierarchy of allocation priorities, based on the mission, goals, activities, and needs of the college and its units.

7. Inasmuch as contracts and grants are awarded for a defined period of time, the assignment of space to support an award is also to be time-limited in accordance with the provisions of the contract or grant. Generally speaking, consideration for continuing space assignment is contingent on the renewal of an award. During the request for renewal, the space assignment should also be reassessed.

8. Due diligence should be exercised to avoid space reallocation during temporary interruptions in funding. An interruption of one year or less may be tolerable, provided that the faculty have developed and implemented a sound plan for the continuation of funding within the coming year.

9. Utilization of space, particularly but not limited to the amount of space and type, will be a consideration at the time of the annual faculty performance review. Space, as a resource, should be allocated in proportion to the productivity of each faculty member and within the contextual needs of each discipline/set of responsibilities. Adjustments in the space assigned may be made based on this review.

[3] *It is recognized that in selected instances, the space plan may not be fully developed prior to the required submittal date for a contract or grant. However, a plan must be in place that provides the space that may be needed if the contract or grant is awarded prior to acceptance of the award by the University Trustees.*

10. Wherever possible, the colleges and units should promote the clustering and sharing of research space among groups of faculty working in related areas, and/or requiring access to similar types of specialized equipment.

11. When space becomes vacant, regardless of the reason, and unless otherwise specified by the Provost, the space vacancy will be communicated to the appropriate space allocation committee, as provided for by existing University policy.

12. The cross-college space allocation committee(s), in consultation with the Provost's Office, have the responsibility for examining space needs across colleges and assessing the assignment of space based on the need to support college and university priorities. The space allocation committee(s) may act on behalf of the colleges. Further, they have the authority to assign and reassign space within facilities occupied by the colleges. When the space allocation committee cannot resolve matters, the issue(s) may be referred to the relevant dean(s) for review and response. In the event that the space committee and the dean(s) cannot reach a resolution, the matter will be referred to the ECBFS. The ECBFS will be the final arbiter in such disputes.

IV. Space Assignment Guidelines and Criteria

A. Office Space

All faculty, academic and non-academic staff, and graduate assistants should be assigned suitable office space to carry out their responsibilities. Suitability may be defined in a variety of ways. For example, suitable space may be located in or adjacent to a laboratory; in or adjacent to a clinic or other clinical facility; in or adjacent to a studio or other space designated for creative endeavors; on or off campus; or otherwise situated at the discretion of the dean or dean's designee. At the discretion of the dean, this could include shared office space. Based on past practice and because they do not have full-time duties, all graduate assistants will share office space.

1. Office space, both private and shared, will be assigned taking into account the following criteria:

   - Level of responsibilities.
   - Type of Appointment.
   - Level of productivity.
   - Proximity to other assigned space (i.e. laboratory, studio or clinical space).
   - Proximity to other faculty with similar academic interests or a demonstrated interest and commitment to collaborative scholarship.

2. Recognizing the limited amount of space, faculty should not be assigned more than one office. In instances where faculty are jointly appointed

and provide services in more than one department or unit, the faculty member, in conjunction with the various units and colleges, is expected to be assigned a primary office. Departments or units that are not providing the primary office may provide suitable workspace for the faculty member. This would typically consist of an office or workspace to be shared with part time, emeriti, or other similarly situated faculty.

3. Emeriti, adjunct, and visiting faculty may, depending on their contribution to the unit, college, or university, be assigned to office space as determined by the appropriate University administrator or designee. In most instances, again recognizing the limitation of space and within the context of the above criteria, productive emeriti faculty would be required to share office space with other similarly situated faculty.

B. Research and Related Support Space

Faculty, with a research agendum, creative project or program approved by the relevant dean(s), should be assigned suitable space to carry out their responsibilities. If space has been provided to a research or project team, the principle investigator will be primarily responsible for ensuring that the space is utilized in accordance with the assignment approval. Shared support space such as cold rooms, dark rooms, tissue culture, autoclaves, etc. are shared among a number of researchers and should be assigned and administered at the unit or college level. At the discretion of the college, laboratory research space also could be shared space. Furthermore, the location, type, and amount of research space will be made at the discretion of the unit and the college in accordance with their needs and priorities. It is also acknowledged that this space is finite and assignment decisions will need to be made on the basis of unit, college, and university priorities with the potential outcome of some space needs not being met. Although, any faculty member subjected to research or creative activity productivity review in their performance evaluations can assume access to space and infrastructure, the space assignment might not include an independent laboratory. All space assignments can and may be adjusted on the basis of productivity and competing priorities of the involved unit, the college, and or the university.

1. A plan for research space for new faculty (including wet, dry, and specialty laboratories), or space for creative endeavors must be approved in advance of any offer and available when the faculty member is hired. It is understood that new faculty, especially junior faculty, are selected based on their potential for productivity in the future, as well as their accomplishments to date. At a minimum, a new faculty member must have developed a research agenda or program that conforms to the strategic plan of the relevant unit(s), as determined by their dean(s). Additionally, the new faculty member should display evidence of, or have strong potential for, some combination of the following:

- Publication or acceptance for publication of refereed journal research articles in the current and immediately preceding years.
- Active and ongoing submission of extramural grant, contract or other proposals to support their research or creative endeavors.
- Ability to support funded graduate research assistants.
- Involvement with collaborators in research team efforts both on campus and externally.
- Evidence of or potential for achieving a national reputation in a chosen field.
- High priority outreach and extension activities, in accord with unit strategy.

2. Space assignments for new faculty should take into account the following factors:

   - Projected duration of projects.
   - Proximity to appropriate support space (i.e., animal management, biochemical hazard control, radiation exposure safety, large equipment and material storage, etc.).
   - Proximity to other assigned space (i.e., laboratory, studio or clinical space).
   - Proximity to other faculty with similar academic interests with a demonstrated interest or commitment to collaborative scholarship.

3. Review of research space (including wet, dry, and specialty laboratories or studios) for currently appointed faculty will be part of the annual performance appraisal process. The review of space will include:

   - The amount and condition of current space assigned, including square footage, laboratory configuration and safety issues.
   - The number of personnel utilizing the space, including faculty, technicians, graduate students, post doctoral fellows, etc.
   - Whether space is shared with other faculty and the estimated amount of time the space is used by each faculty member.
   - Record of productivity as outlined in number four below.

4. Space may be continued for currently appointed faculty taking into account a combination of the following:

   - A research agendum or program that conforms to the strategic plans of the unit, college and university, as determined by the relevant dean(s), in conjunction with the departments.
   - Recognition of active research as evidenced by the following types of indicators over a three year rolling average (this is an illustrative, not a definitive, listing):

- Publication or the acceptance for publication in high-quality, refereed journals of research articles in the current three year period.
- Significant performance, exhibits or other forms of referred review in the creative arts.
- Success at obtaining extramural funding to support the faculty member's research or creative endeavors.
- Active links with commercial or private industry through fiscal and technical support.
- Ability to support funded graduate research assistants.
- Involvement with collaborators in research efforts both on and off campus.
- Evidence of a national reputation in his/her chosen field(s).
- Strategically-oriented outreach and/or extension activity, including that aimed at economic development and the creation of new jobs for the region.

- The projected duration of currently funded projects.
- The identification of planned project renewal, new, or expanded projects.
- Anticipated changes in the personnel levels required to accomplish the research program.
- Interest in reconfiguration or an alternative space assignment that may facilitate a new project by relocating all or a portion of the assigned space to a different location, to better support new or ongoing collaborative research.
- Proximity to appropriate support space (i.e. animal management, biochemical hazard control, radiation exposure safety, large equipment and material storage, etc.).
- Proximity to other assigned space (i.e. laboratory, studio or clinical space).
- Proximity to other faculty with similar academic interests given a demonstrated interest and commitment to collaborative scholarship.

5. The amount of space previously assigned may be modified based upon a combination of the factors outlined in Number 3. above.

6. The university has a responsibility to provide appropriate support to all three parts of a faculty member's role: teaching, research, and outreach. In many cases, that includes access to research space, but it does not guarantee exclusive access to a given space.

Public Art on Campus

Committee Accomplishments
December 1999 through June 2008

Campus Planning and Administration
January 9, 2009

Table of Contents:

Art by chronological order of installation

Public Art on Campus Committee

In December 1999, the Michigan State University Board of Trustees (BOT) authorized a new Board Established Committee to advance the presence of public art on campus. The Public Art on Campus Committee (PAOCC) is charged with making recommendations to the Provost and the Vice President for Finance and Operations and Treasurer regarding the acquisition, placement and maintenance of public art on the MSU campus.

The BOT authorization furthermore resolves that Michigan State University will dedicate ½ of 1% of the cost of major renovations or new buildings (excluding utility facilities) to public art, up to a maximum of $250,000. The dedicated funds may be handled in several ways including in priority order:

- Cash donations
- In-kind art contributions
- Assignment of art already owned by the university
- Specific allocation of university funds

Any remaining funds (the difference between the budgeted amount and the amount required for purchase and installation) are put into a common campus art fund to support more costly art acquisitions or to acquire additional public artwork. Remaining funds can also be used for maintaining the public art collection.

Since its inception, the Public Art on Campus Committee has guided the installation of 13 major pieces of outdoor sculpture, 26 paintings/photographs and one interior hanging sculpture. In addition, the PAOCC guided the installation of a bronze replica of *The Spartan*, and approved the installation of various pieces presented to the university that met the goal of providing high quality public art that enriches the learning environment, stimulates lively discussion and evokes aesthetic appreciation of the MSU campus.

The committee also developed standards for labeling campus public art; implemented a process to engage stakeholders in the selection process; fostered the identification of donated art; assisted in the promotion and marketing of campus public art; and fostered appropriate educational activities related to the addition of new art on campus.

The following report provides an overview of the committee's accomplishments through Fiscal Year 2007-2008 via a pictorial and narrative review of the major art installations.

Biomedical/Physical Sciences Art

By Various Artists

Year of Installation:	2001
Fabrication Date:	Varied
Material:	Various Mediums
Campus Location:	Biomedical and Physical Sciences Building

About the Pieces:

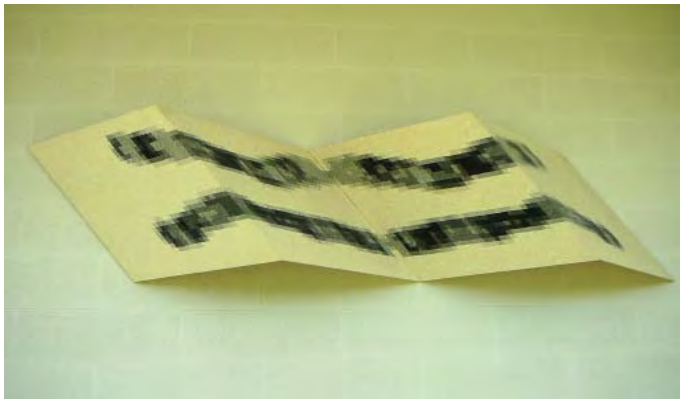
The Biomedical and Physical Sciences building was in progress when the public art initiative was authorized by the BOT. As a result, it did not have an art budget. Provost Simon, understanding the importance of this new facility and being a strong supporter of the public art on campus initiative, leveraged funding to meet the program's requirements. This resulted in the acquisition of 26 individual paintings, photographs and other wall hangings all crafted by MSU art department faculty. In addition, a major outdoor sculpture was commissioned by Michigan artist Russell Thayer that graces the south building entrance along Wilson Road.

Many of these pieces can be interpreted within the context of the biological, medical, and physical sciences programs that the building serves to integrate. The pieces are placed throughout the building in public spaces and provide a wonderful connectivity between the facility's programmatic activities, the sciences, arts and humanities, and the institution's renowned faculty artists.

Ascention at Giza by Karl Wolter
Charcoal, Pastel and Ink
First Floor

Biding Juju by D'Ann de Simone
Oil Collage on Canvas
First Floor

Brim Full by Alisa Henriquez
Oil and Fabric on Canvas
Second Floor



Chromosome Twin by Brian Boldon
Ceramic Screenprint
First Floor

Clues for DCI Tennison by Karl Wolter
Charcoal, Pastel and Ink
Fourth Floor Conference Room

Collections by Tom Berding
Oil on Canvas
First Floor

Delusion I by Gregory Siler
Oil on Canvas
First Floor

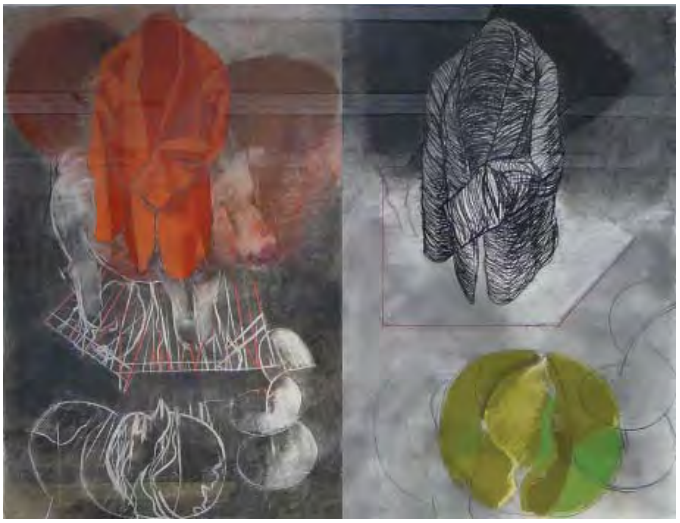
Delusion II by Gregory Siler
Oil on Canvas
First Floor

Delusion III by Gregory Siler
Oil on Canvas
First Floor

Echo by Jim Fagan
Acrylic
First Floor

Heavy Weather/Storm Directly East
by Irving Taran
Oil on Canvas
Second Floor

Lorain by Gregory Siler
Oil on Canvas
First Floor



Masters at the Game by Karl Wolter
Charcoal, Pastel and Ink
Second Floor Conference Room

Ordinary Sublime by Karl Wolter
Charcoal, Pastel and Ink
Third Floor Conference Room

Pink Globe by D'Ann de Simone
Woodcut, Gouache and Ink
Sixth Floor

Pinkfade by Jim Fagan
Acrylic
Fifth Floor

Detail-Polytech XXIV by Clifton McChesney
Acrylic on Canvas
First Floor

Radium Falls by Irving Taran
Acrylic on Birch Panels
First Floor

Sea Grass by D'Ann de Simone
Gouache Mixed Media
Second Floor

Stipescape by Jim Fagan
Acrylic
Fourth Floor

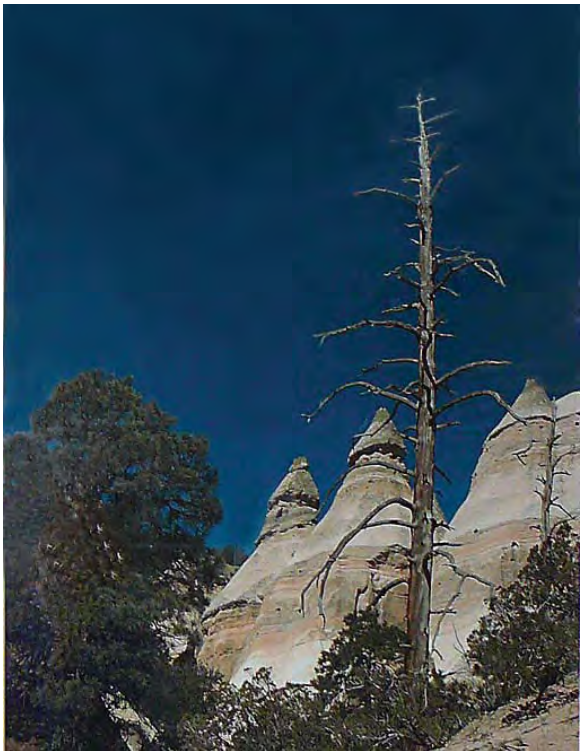
Trees (spring) by D'Ann de Simone
Lithograph, Gouache
Third Floor

Triangles and Stripes by Jim Fagan
Acrylic
Third Floor

Fresnel Lens by Roger Funk
Digital Print
First Floor

Rocks and Sand by Roger Funk
Digital Print
Fifth Floor

Spiral Stairs by Roger Funk
Digital Print
Sixth Floor



Tent Rocks by Roger Funk
Digital Print
Fourth Floor

John Hannah

By Bruce Wolfe

Year of Installation:	2004
Fabrication Date:	2004
Material:	Bronze w/ granite base
Campus Location:	Plaza north of the Administration Building

About the Piece:

The bronze sculpture, dedicated in a ceremony that included Hannah's son Thomas, is seven feet tall and weighs more than 700 pounds. Standing on a granite base, the statue captures Hannah walking briskly in mid-stride, reflecting his non-stop activity on behalf of the university. "John Hannah dramatically raised the reputation and profile of our university," said former MSU President Peter McPherson. "But, just as importantly, he raised our expectations and aspirations." Hannah was MSU's 12th president, serving from 1941 to 1969, a period of unprecedented growth for the university and a time that saw MSU become one of the largest and most respected universities in the world. It was under his leadership that the university's student population rose from 6,000 to nearly 40,000. It was also during that time that Michigan State College became Michigan State University. Hannah's association with the university spanned seven decades – from the 1920s when he was with the Cooperative Extension Service to the 1980s when he served as president emeritus. The sculpture, which was funded entirely by private dollars, was created by Bruce Wolfe, a renowned California artist who is known for his ability to capture the unique and often subtle attributes of his subjects. The dedication of the statue was one of the many events commemorating MSU's 150th anniversary and is also the first project commissioned under the public art on campus initiative by the Public Art on Campus Committee.

Artist Bio:

Bruce Wolfe is a native Californian born in Santa Monica and residing in Northern California nearly all his life. Adept in oils as well as lost-wax bronze, he has received commissions to create busts and figurative portraits of many notables. He studied art at San Jose State University and The Art Institute of California - San Francisco. Mr. Wolfe has taught figure painting at the Academy of Art in San Francisco, and sculpture and painting at the College of Arts in Oakland, California. Bruce Wolfe has had five solo exhibitions of his work including one at La Galerie in Paris, France.


"THE UNIVERSITY IS AN INTEGRAL PART OF A
SOCIAL SYSTEM THAT HAS GIVEN MORE OPPORTUNITY
MORE FREEDOM, MORE HOPE TO MORE PEOPLE
THAN ANY OTHER SYSTEM
Hannah

The Spartan (bronze)

By Leonard Jungwirth (Sculpture)
Artworks Foundry (Casting)

Year of Installation:	2005
Fabrication Date:	2005
Material:	Bronze
Campus Location:	North end of Demonstration Field

About the Piece:

The original terra cotta sculpture was created by Leonard Jungwirth in 1945. While annual repair work helped stem the damage done by precipitation, extreme cold and vandalism, the statue eventually needed more intensive repair. In 1989, the Save Our Sparty (SOS) campaign helped restore the statue and created fiberglass molds for future conservation efforts. By 2003, university officials estimated that the terra cotta statue would only last five to seven more years before crumbling beyond repair. Unfortunately, the 1989 molds had deteriorated and new molds were made in 2004 to cast an identical bronze replica that Michigan State hopes will withstand weather and vandalism. During the summer of 2005, the intersection at which the statue stood was completely redesigned to allow for safer motorized and non-motorized circulation and to provide a plaza within which the sculpture sits. On Thursday August 25, 2005 an unveiling of the new bronze Spartan took place. In addition, a parade commemorating the University's sesquicentennial on Saturday, October 8, 2005, concluded with a dedication ceremony at the statue. To this day it is tradition for some alumni and other Spartan fans to have a picture taken with the statue to mark major life events. This version of *The Spartan* was funded by private gifts. The origional ceramic stuatue has been relocated to the ground floor of Spartan Stadium.

Artist Bio:

Leonard Jungwirth was a dedicated art professor who taught at MSU from 1940 until his death in 1963. Born in Detroit, he worked in his father's wood carving shop before earning degrees at the University of Detroit and Wayne State University. He also studied religious sculpture at the Academy of Fine Arts in Munich. In the 1930s, he was an artist and supervisor in Detroit for the Works Progress Administration's Federal Art Project, a government program which paid artists to make work for public facilities during the Depression. His secular and religious sculptures were exhibited widely often with his wife painter Irene Gayas Jungwirth. Professor Jungwirth suffered a fatal heart attack after casting bronze at a local foundry with his students in 1963.

Artworks Foundry, located in Berkeley, California, is among the nation's leading foundries for the production and restoration of bronze sculptures, reliefs and monuments. Since its founding in 1977 by master craftsman Piero Mussi, Artworks Foundry has served over 2,000 artists in projects ranging from miniature to monumental under Dale Smith's leadership.


THE SPARTAN
LEONARD D. JUNGWIRTH (AMERICAN, 1903-1963)
MSU FACULTY MEMBER, DEPARTMENT OF ART, 1940-1963
ORIGINAL TERRA COTTA SCULPTURE, 1945
BRONZE CAST FROM ORIGINAL, 2005
DEDICATED ON OCTOBER 8, 2005
IN 1926 GEORGE S. ALDERTON, SPORTS EDITOR FOR THE LANSING STATE JOURNAL, AND DALE STAFFORD, SPORTSWRITER FOR THE LANSING CAPITOL NEWS, DISAVOWED "THE MICHIGAN STATERS" AS THE INSTITUTION'S TEAM NAME. INSTEAD, THEY SELECTED THE "SPARTANS," A NAME SUBMITTED BY PERRY J. FREMONT A FORMER MICHIGAN STATE ATHLETE.


"The Spartan" has been cast in bronze, and a new plaza surrounding the statue has been created, through gifts of $25,000 or more from the following persons and groups:
Associated Students of MSU
Laurie M. Dama
MSU Alumni Club of Metro Chicago
MSU Alumni Club of Minnesota
MSU Alumni Club of West Michigan
MSU Development
The Peter F. Secchia Family
In Honor of Brayden and Davis Smith
Howard P. Stoddard, Jr.
Student Alumni Foundation

BP-87

By Caspar Henselmann

Year of Installation:	2006
Fabrication Date:	1987
Material:	Painted Steel and Coated Styrofoam
Campus Location:	Biomedical and Physical Sciences Building

About the Piece:

This piece was originally conceived for a show at Chicago's Navy Pier. At the time, Caspar Henselmann was preoccupied with tectonic plate movement. The concept behind the piece is embedded in the physical reality that we are sitting on a thin floating surface on a small sphere on an elliptical trajectory within our solar system. This sculpture was donated to MSU by the artist.

Artist Bio:

Caspar Henselmann was born in 1933 in Germany and grew up in Ticino, Switzerland. His family immigrated in 1950 to the United States and settled in Chicago, Illinois. He received a B.F.A. from The Art Institute of Chicago and a diploma of medical illustration from the College of Medicine at the University of Illinois. He worked in Detroit, Michigan and turned to sculpture during his studies there. He settled in New York City where he has worked and lived since 1960. The artist, known for large-scale minimalist structures in steel, wood, and concrete, also produces intimate pieces using similar materials and procedures. He has exhibited extensively in the United States and Europe, including 25 solo shows. His works are in museums and in many private collections both in Europe and the United States.

Collateral Damage:

If You Can't Say Anything Good About Someone, Sit Right Here By Me

By Joseph Mannino

Year of Installation:	2006
Fabrication Date:	1999
Material:	Stoneware Benches
Campus Location:	Wells Hall (east side)

About the Piece:

Joseph Mannino states: "My sculpture employs architectural elements in order to create structures that are playful yet ominous and contradictory. Many of my works can be read as monuments. The Latin translation of monument alludes to things that remind. My sculptures are psychological stopping points, offering a place to contemplate a complex world. They are not heroic memorials, but quiet commemorations."
The concept for Mannino's piece *Collateral Damage* was a quotation from an embroidered pillow on a loveseat belonging to Alice Roosevelt Longworth that read "If you can't say anything good about someone, sit right here by me." The sculpture was donated to MSU by the artist and the installation was underwritten by a gift from the graduating class of 2006.

Artist Bio:

Joseph Mannino was born in Chicago, Illinois in 1950. He received his B.A. degree from Knox College in Galesburg, Illinois and his M.F.A. from Southern Illinois University in Carbondale. Mannino has had numerous solo exhibitions both nationally and abroad. His work uses static forms to express his reactions to cultural, political and personal events. He translates these reactions into works made up of simplified forms, often with outsized proportions, so as to transcend time and space and to elicit an emotional and intellectual response. Mannino aims to engage his viewers and invite them to address issues they might prefer not to see. A recipient of a Pennsylvania Council on the Arts grant, Mr. Mannino is presently Associate Head of the School of Art and Associate Professor of Art at Carnegie Mellon University in Pittsburgh.

Cherished

By Jonathan and Evelyn Clowes

Year of Installation:	2007
Fabrication Date:	2007
Material:	Metal and wood
Campus Location:	Veterinary Oncology Building Atrium

About the Piece:

"We create 'site specific' sculptures. We visited [MSU] to get to know the site and to learn the mission, as our goal is to create an artistic or sculptural expression that speaks to both. We feel this sculpture is an expression of a nurturing and caring gesture toward animals, which is what the Veterinary Teaching Hospital is all about- it's a compassionate, loving place." –Evelyn Clowes

Artist Bio:

Growing up in a family who loved sailing, Jonathan Clowes's early aesthetic influences grew from nature, the graceful curves of sea-faring vessels, sails, and the ocean. As a young boy Jonathan was always making things. His pursuit of sculpture-making took him from the halls of M.I.T., Boston's Museum School and the Portland School of Art to the boat yards of New England where he notes, "one really learns to appreciate craftmanship." His recent work has been the result of collaboration with his wife Evelyn, who is his artistic, as well as his life partner.

Evelyn Clowes's work, as an ordained minister and as an artist, celebrates abundant life that is found in nature; among the hills and high holy places of this planet. Her forms and joyful use of color authentically represent that which is vibrantly alive, not just the physical, but also the numinous. While her own wonder and awe are part of her work, Evelyn seeks to express a more universal wondering that communicates deeply with those who view her work. For this artist, the composition of forms married with rich detailing, are part of her effort to express deeply felt human and spiritual realities. She hopes each person will be touched by her work, such that they begin to grasp the truth and see the goodness invested in themselves.

Life's Lessons

By George Lundeen

Year of Installation:	2007
Fabrication Date:	2007
Material:	Bronze
Campus Location:	Michigan 4-H Children's Garden

About the Piece:

The child seeking knowledge is well suited within the Michigan 4-H Children's Garden. The sculpture illustrates the quest for knowledge and compassion for nature. As an interactive piece, it is comfortably at home in this interactive garden. This sculpture was a gift from Jane Taylor, the founder and first curator of the Michigan 4-H Children's Garden.

Artist Bio:

A native of Holdrege, Nebraska, George Lundeen was a Fulbright-Hayes Scholar studying at the Academia de Belle Arte in Florence, Italy. He holds a Master of Fine Arts from the University of Illinois and a Bachelor of Arts from Hastings College in Nebraska. Lundeen established his sculpting studio in Loveland, Colorado in the mid-1970s where he currently lives and works. He has been commissioned to sculpt portraits and interpretive works for universities, municipalities, foundations and corporations. Mr. Lundeen is a member of the National Academy of Design and the National Sculpture Society.

Pegasus

By Avard Tennyson Fairbanks, Ph.D.
Grant R. Fairbanks, M.D.

Year of Installation:	2007
Fabrication Date:	2006
Material:	Bronze
Campus Location:	Pegasus Critical Care Center

About the Piece:

"This piece is dedicated to the spirit of Matilde R. Wilson who through her enduring legacy, the Matilde R. Wilson Fund, has given wings to our dreams."

-Quote from sculpture pedestal

The Pegasus sculpture was started by Avard Fairbanks and after his death New Year's Day in 1987, was completed by his son Grant.

Artist Bio:

Avard Fairbanks was born in Provo, Utah in 1897. His father, John B. Fairbanks, was an artist and art professor. Avard's brother, J. Leo Fairbanks was also an artist and helped Avard start sculpting as a teenager. In 1918, Avard worked with his brother on friezes for the Laie Hawaii Temple. It was during this time that he married Beatrice Maude Fox in Honolulu, Hawaii. This would not be Fairbanks's last connection with temples. The statues of the Angel Moroni on the Washington D.C. Temple, the Jordan River Utah Temple, Seattle Washington Temple and the São Paulo Brazil Temple are all Fairbanks's work. Fairbanks studied at the Art Students League of New York beginning at age 13 and the École Nationale Supérieure des Beaux-Arts beginning at age 17. He received his bachelor's degree from Yale University and his master's degree from the University of Washington. For three years Fairbanks studied on a Guggenheim Fellowship in Florence, Italy. He earned his Ph.D. in anatomy from the University of Michigan, where he also was a professor of sculpture, before heading to the University of Utah to teach. Fairbanks made a statue of Lycurgus that led to his being knighted by King Paul of Greece. Four of his sculptures are on display in the United States Capitol, and many more are featured in state capitols and other locations. Possibly his most enduring artistic contribution was designing the ram symbol for Dodge.

Twyla

By Bill Barrett

Year of Installation:	2007
Fabrication Date:	2005
Material:	Fabricated Bronze
Campus Location:	Grand River Parking Ramp (west entrance)

About the Piece:

Twyla's name is inspired by both the artist's granddaughter Twyla and the professional dancer and choreographer Twyla Tharp. The piece exhibits the artist's gravitation to the freedoms embodied in Abstract Expressionism. Twyla's expressive gesture hints at fluid movement, human form, grace, and balance with an energetic tension visible from all vantage points.

Artist Bio:

Bill Barrett, one of today's foremost sculptors, was born in Los Angeles, California. He earned a B.S. and M.S. in Design from the University of Michigan, and later an M.F.A. from the same institution. Since mid-1960, Barrett has been exhibiting his unique metal sculptures and abstract paintings in numerous solo and group exhibitions in such places as the United States, Switzerland, Bulgaria, and Japan. Barrett's sculptures of fabricated aluminum, bronze, or steel address the interplay between positive and negative space with grace, elegance and exquisite balance. His sophisticated constructions, through a delicate balance of form and content, transcend the starker aesthetics of minimalism with a warmth and humanity. Barrett, who divides his time between New York City and Santa Fe, is represented in numerous private and public collections nationwide. His works have been installed on many university campuses and he is frequently called upon to produce large public sculpture on commission.

Unity III

By Charles McGee

Year of Installation:	2007
Fabrication Date:	2007
Material:	Powder-Coated Aluminum
Campus Location:	Energy and Automotive Research Building

About the Piece:

There is a captivating energy and sense of movement created by the connectivity and magnetism of the sculpture's form, representing the cohesion of mankind into a universal form. In its purest sense, the sculpture depicts people coming together and the inherent beauty of this synergy. The artist's life is rooted in the belief that people must connect and work together to achieve outcomes that benefit all, including world peace. The artist believes that strength and progress will emerge from connectivity rather than individualism.

Artist Bio:

Charles McGee was born in Clemson, South Carolina in 1924. At the age of ten his family left their farm and its rural lifestyle and moved to industrialized Detroit. He was immediately fascinated by all the signs, kinetic movement, and activity of the city. McGee then went on to study under artist Guy Palazzola at the Society of Arts and Crafts (now the College for Creative Studies) for 10 years before establishing his own school in 1969. With a volunteer staff, he founded the Charles McGee School of Art and taught children and adults until the school closed in 1974. He spent 18 years teaching art at Eastern Michigan University, has taught at the University of Michigan, and currently shares his experience with his students at the Birmingham Bloomfield Art Center. The College for Creative Studies recently awarded him an honorary doctorate for his career as an artist and educator.

Over the years McGee has curated several exhibitions including *Seven Black Artists* at the Detroit Artists Market in 1969. That show was pivotal in his career, leading him to establish Gallery 7, an artists' collective that lasted 10 years. In 1979, McGee, along with artist Jean Heilbrunn and others, founded the Contemporary Art Institute of Detroit in an attempt to invigorate the art scene. McGee continues to explore abstract compositions often using simple forms of straight lines, curves and dots to connote the passage of time and complex layers of experience. He was awarded the first ever Eminent Artist Award from the Kresge Foundation in December 2008.

US 1-9

By Caspar Henselmann

Year of Installation:	2007
Fabrication Date:	1987
Material:	Painted Steel
Campus Location:	Erikson Hall (north side)

About the Piece:

US 1-9 represents a personal experience the artist had while driving on a maze of highways to his first teaching experience at Rutgers University. This experience inspired the concept of a large sculpture representing a highway interchange that would be placed into a hill. The full-scale piece was never implemented. The sculpture was donated to MSU by the artist.

Artist Bio:

Caspar Henselmann was born in 1933 in Germany and grew up in Ticino, Switzerland. His family immigrated in 1950 to the United States and settled in Chicago, Illinois. He received a B.F.A. from The Art Intistitute of Chicago and a diploma of medical illustration from the College of Medicine at the University of Illinois. During his time working and studying in Detroit, Michigan he turned to sculpture. He settled in New York City where he has worked and lived since 1960. The artist, known for large-scale minimalist structures in steel, wood and concrete, also produces intimate pieces using similar materials and procedures. He has exhibited extensively in the United States and Europe, including 25 solo shows. His works are in museums and in many private collections both in Europe and the United States.

Gateway to Health

By Doug DeLind

Year of Installation:	2008
Fabrication Date:	2008
Material:	Welded Bronze
Campus Location:	IM West Building (north side)

About the Piece:

This sculpture depicts exercise in a diverse world and human engagement in sports and recreation. Located outside the IM West Building, it physically and emotionally ties with the mission of the Intramural and Recreative Sports department.

Artist Bio:

Doug DeLind of Lansing, Michigan, was born in 1947. He is well known for his prints, paintings, bronze sculptures and ceramics. He has won numerous awards in ceramics with permanent installations in Michigan, Georgia, Illinois and Pennsylvania. A master of the ancient Japanese firing technique known as Raku, his sculptures are visages of ancient deities; nearly all portraying human faces. “The creation of a symbol to represent a human face is the most basic artistic drive of vital people,” DeLind says. “It says ‘I exist’ to other people of other times.” He holds bachelor’s and master’s degrees in advertising, sculpture and ceramics from Michigan State University. He has taught ceramics, jewelry and art history at community colleges and workshops. Between 1976 and 1977 he served as an artist-in-residence for Okemos Public Schools. Mr. DeLind shows his work in galleries in Michigan, Indiana, and Massachusetts.


IM SPORTS — WEST

Sculptural Improvisation II

By Richard Hunt

Year of Installation:	2008
Fabrication Date:	1991/2008
Material:	Welded Bronze
Campus Location:	Biomedical and Physical Sciences Courtyard

About the Piece:

Many of Hunt's sculptures, including this one, are influenced by the surrealist ideas of other artists like Matta and Picasso. He has always taken an interest in the morphology and blending of natural and industrial forms. He states," It is my intention to develop the kinds of forms nature might create if only heat and steel were available to her." He has also said that his work is "the kind of sculpture where you can take material and work it and rework it, cut something off, reposition something…" His ideas clearly support the title of this piece.

Artist Bio:

Richard Hunt was born in Chicago in 1935 and received his B.A.E. from The Art Institute of Chicago. He was awarded the Logan Prize from The Art Institute of Chicago in 1956, while still a student there, and again 6 years later. The Museum of Modern Art in New York purchased their first work of his in 1956 while he was still a student at The Art Institute of Chicago. He was given a retrospective there in 1970. A major touring exhibition of his work was produced by International Arts & Artists, Inc. for Detroit's Charles H. Wright Museum of African American History in 1998. Hunt has completed more than 100 commissions, more public sculptures than any other artist in the country. His signature pieces include *Jacob's Ladder* at the Carter G. Woodson Library in Chicago and *Flintlock Fantasy* in Detroit. He was appointed by President Lyndon Johnson as one of the first artists to serve on the governing board of the National Endowment for the Arts and he also served on boards of the Smithsonian Institution. Hunt is the recipient of numerous awards and honorary degrees including the International Sculpture Center's 2009 Lifetime Achievement award. His work is always organic, with flowing, upward movement. Although abstract, it makes general reference to nature, growth, yearning, and reaching for light and life, which may account for his success with public art in a world that is generally resistant to abstraction.

Thomas Jefferson

By Bruce Wolfe

Year of Installation:	2007
Fabrication Date:	2007
Material:	Bronze
Campus Location:	Radiology Gardens

About the Piece:

This sculpture of Thomas Jefferson conveys the idea that hard work and dedication nurture growth not only of plants, but also of the human body, mind, and spirit.

Artist Bio:

Bruce Wolfe is a native Californian born in Santa Monica and residing in Northern California nearly all his life. Adept in oils as well as lost-wax bronze, he has received commissions to create busts and figurative portraits of many notables. He studied art at San Jose State University and The Art Institute of California - San Francisco. Mr. Wolfe has taught figure painting at the Academy of Art in San Francisco, and sculpture and painting at the College of Arts in Oakland, California. Bruce Wolfe has had five solo exhibitions of his work including one at La Galerie in Paris, France.


"...EVERY TREE SHALL BE MADE TO BEAR
FRUIT AND EVERY PLANT NOURISHMENT."
-THOMAS JEFFERSON

Untitled

By Russell Thayer

Year of Installation:	2008
Fabrication Date:	2008
Material:	Painted Steel
Campus Location:	Biomedical and Physical Sciences Bldg. (South entrance)

About the Piece:

The artist Russell Thayer writes: "This sculpture is designed to be a bright arrow pointing to the recessed entry of the building complex that is otherwise invisible to the people or vehicles coming down the street. It is a welcoming gazebo-like structure encouraging interaction between the people and the artwork, a place of congregation for the users of the building. Visually, it has a feathery lyricism on a street of right angles. It is like a colorful flower growing between a pile of cement blocks. It is not a sculpture on a pedestal separated from the people only to be looked at, but a piece to be involved with by walking through."

Artist Bio:

Born in1934, Russell Thayer is one of Michigan's most respected artists and art educators. He has created a vast number of pieces as an artist in the last forty years. After graduating from the University of Michigan School of Art, he became a teacher of art and art history at Delta College where he recently ended his formal teaching career. Some of his artistic influences are architecture, Asian art, and Medievalism. Thayer excells at merging elements from diverse cultures to create harmonious compositions in his drawings, paintings and sculptures.

Works In Progress

The following summarizes projects for which the Public Art on Campus Committee has either identified an artist, is commissioning a piece, or has selected an existing piece for purchase. This report will be updated as the pieces are fabricated and installed on campus.

1. *Beal Garden Gates*, made possible by a generous gift from Alumna Mrs. Sandra Carlisle. The gates, fabricated to resemble plant forms, are being crafted by Stefani & Company of Birmingham, Michigan. The gates were installed in October 2008 and will be included in the next report for fiscal year 2008-2009.
2. The university has agreed to purchase a sculpture titled *Global Balance* by artist Christoph Spath for the new Communication Arts courtyard. The courtyard and the sculpture are funded by a gift from alumnus Richard Bush.
3. With approval, John Van Alstine will be commissioned to design a sculpture for the north lawn of Snyder/Phillips Hall. The piece will be made of stone and steel.
4. Four works of art by artist Chakaia Booker are being purchased for the new Surplus Store and Recycling Center. Her pieces feature recycled rubber tires composed into various dynamic forms.
5. The Mary Mayo Hall renovation will include interior art crafted by the Motawi Tile Company of Ann Arbor, Michigan. In addition, a painting will be acquired for placement above the second fireplace.

Committee Membership

Susan Bandes
Director, Kresge Art Museum

Thomas Berding
Chair, Department of Art and Art History

Kurt Dewhurst
Director, MSU Museum

Marti Heil
Associate Vice President for University Development

Jeffrey Kacos
Director, Campus Planning and Administration

Michael Kiley
General Counsel

April Kingsley
Curator, Kresge Art Museum

William Latta
Associate Vice President for Advancement Services

Linda Stanford
Associate Provost for Academic Services

Stephen Troost
Campus Planner

Real Property Holdings

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Tollgate Education Center, Novi

Prepared by:

Land Management Office

Real Property Holdings - Table of Contents

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Real Property Holdings - Real Estate Facts

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

- MSU-owned lands comprise 23,591.705 acres
- Main campus lands (north of Mt. Hope) comprise 2,049.577 acres
- Research, education, and outreach lands (south of Mt. Hope) comprise 2,738.392 acres
- The golf course is 325 acres
- 82.256 acres of campus lands are leased to others
- Off-campus properties include 18,390.789 acres
- Property for sale comprise 5.691 acres

- .240 acres and the Michigan Street Project Condominium - Unit 5 were purchased for the College of Human Medicine in Grand Rapids
- Pfizer donated 6.3 acres with a research facility in Holland
- No properties were sold during the period of July 1, 2007 - June 30, 2008

- New mineral leases were entered into for properties identified as:
  MacCready Reserve
  Rogers Reserve
  Martin Property (Rose-Dell Seed Orchard)

- Leases of a term of ten years or greater require Board of Trustee approval. A long-term lease was recently entered into with the YMCA at the Brook Lodge property in Kalamazoo County. Only real property leases are included in the Real Property Holdings report.

- The University has three State Building Authority bond-financed projects. The project site parcel is deeded to the State Building Authority and leased back to the University. Current projects are: Anthony Hall Dairy Plant and Meat Lab (to be repaid 2032); Biomedical and Physical Sciences Building (to be repaid 2037); and Diagnostic Center for Population and Animal Health (to be repaid 2041). SBA bonds are typically issued for 35 years but the State may retire them before their maturity date.

- A fifty year lease between Michigan State University and the State of Michigan was entered into February 1956 for approximately six acres on Harrison Road. The Department of Agriculture constructed a lab on the parcel known as the Geagley Laboratory. In 2002, the parcel was deeded to the State of Michigan in order for the State to convey the property to the State Building Authority to obtain bond financing for needed improvements. An "Agreement to Restore Title" requires the State to deed the parcel to Michigan State University at the time the property is conveyed back to the State from the State Building Authority. At that time, a lease will be entered into between Michigan State University (landlord) and the State (tenant) in order for the State to continue occupancy at the Geagley Laboratory. The "Agreement to Restore Title" is on file in the Michigan State University Office of General Counsel and the Land Management Office.

Real Property Holdings - Summary

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

PROPERTY	**ACRES**
East Lansing Campus	
North of Mt. Hope	2,049.577
Golf Course	325.000
Research, Education and Outreach South of Mt. Hope	2,738.392
Campus Property Leased to Others	82.256
Total Campus Acres	**5,195.225**
Off-Campus	18,390.789
Property for Sale	5.691
Total Deeded Acres	**23,591.705**
Property Leased to MSU Long-Term	365.000
Total Leased and Deeded Acres	**23,956.705**

Real Property Holdings - Acquisitions and Properties Sold

MICHIGAN STATE UNIVERSITY

July 1, 2007 - June 30, 2008

ACQUISITIONS		**ACRES**
Property:	College of Human Medicine - Grand Rapids 443 Michigan Street, NE Grand Rapids, Michigan Kent County	0.240
Acquisition Date:	12/11/2007	
Acquisition Cost:	$950,000.00	
How Acquired:	Purchase	
Property:	Michigan State University - Holland No # Howard Avenue 182 Howard Avenue 281 Holland Avenue 275 Howard Avenue Holland, Michigan Ottawa County	6.300
Acquisition Date:	12/21/2007	
How Acquired:	Donated	
Property:	College of Human Medicine - Grand Rapids Michigan Street Project Condominium - Unit 5 Grand Rapids, Michigan Kent County	0
Acquisition Date:	12/19/2007	
Acquisition Cost:	$15,449,820.00	
How Acquired:	Purchase	

PROPERTY SOLD		**ACRES**
Property:	None	0

PROPERTY FOR SALE		**ACRES**
Property:	Hulett Road Engineering	5.691

Real Property Holdings - Active Mineral Leases

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

MSU owns the Martin Property, MacCready Reserve, Rogers Reserve, and the Management Education Center. The Mancelona Property and Homer Nowlin Property were sold; MSU retained the mineral rights on both properties.

PROPERTY	**ACRES**
Mancelona Property (MSU owns mineral rights) Section 16, Mancelona Township, Antrim County Leased to Mercury Exploration Co. Lease is continued with producing well	31.400
Martin Property (Rose-Dell Seed Orchard, MSU owns surface and mineral rights) Sections 23 and 24, Albion Township, Calhoun County Leased to West Bay Exploration Three year lease (commenced December 2007)	160.000
MacCready Reserve (MSU owns surface and mineral rights) Sections 11 and 14, Liberty Township, Jackson County Leased to West Bay Exploration Three year lease (commenced December 2007)	408.000
Rogers Reserve (MSU owns surface and mineral rights) Section 4, Liberty Township, Jackson County Leased to West Bay Exploration Three year lease (commenced December 2007)	77.373
Homer Nowlin Property (MSU owns mineral rights) Sections 28 and 23, Rich Township, Lapeer County Leased to Total Petroleum, Inc. Lease is continued with producing well	313.000
Management Education Center (MSU owns surface and mineral rights) Section 9, Troy Township, Oakland County Leased to West Bay Exploration Company Lease is continued with producing well	24.320
Total Acres Under Mineral Leases	**1,014.093**

Real Property Holdings - Mineral Rights Reserved on Sold Properties

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

PROPERTY	ACRES
Allegan County	
Section 21, Saugatuck Township	53.275
Antrim County	
Section 16, Mancelona Township	29.900
Clinton County	
Section 22, Eagle Township	24.000
Sections 22 & 27, Eagle Township	61.300
Ingham County	20.369
Section 1, Delhi Township	
Lapeer County	
Section 28, Rich Township	10.000
Section 33, Rich Township	303.000
Lenawee County	
Section 29, Adrian Township	80.000
Monroe County	
Section 21, Milan Township	80.000
Oakland County	
Sections 2, 11, 12, Avon Township	234.434
Section 32, Bloomfield Township	5.000
Ontonagon County	
Section 6, Bohemia Township; Section 12, Greenland Township	78.000
Section 23, Bohemia Township	40.000
VanBuren County	
Section 6, Geneva Township	29.000
Section 23, South Haven Township	53.230
Total Mineral Acres Reserved:	**1,101.508**

Real Property Holdings - Gas and Oil Royalty Income

MICHIGAN STATE UNIVERSITY

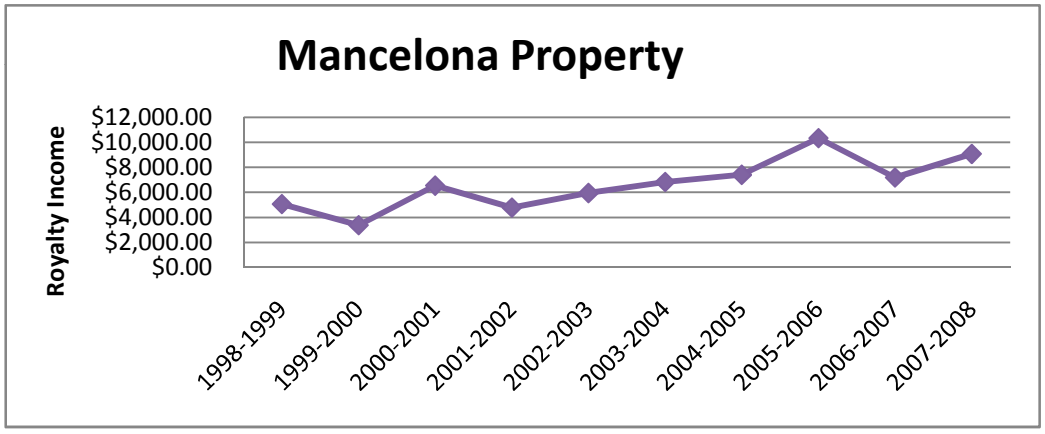
As of July 1, 2008

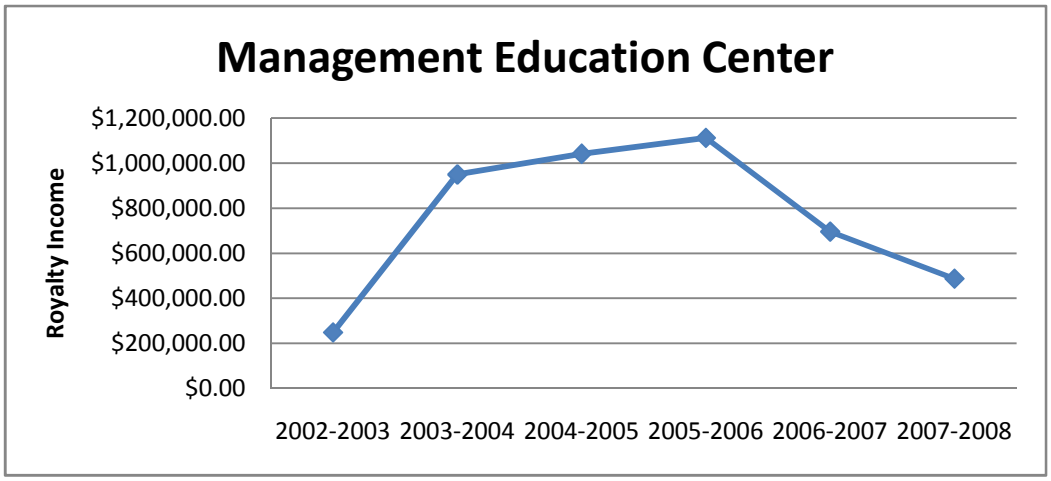
Mancelona Property
(Income funds the Land Fund Account)

1998-1999	$5,068.62
1999-2000	$3,390.42
2000-2001	$6,547.95
2001-2002	$4,789.45
2002-2003	$5,958.69
2003-2004	$6,833.60
2004-2005	$7,415.27
2005-2006	$10,337.62
2006-2007	$7,192.83
2007-2008	$9,082.79

Management Education Center
(Income funds Eli Broad College of Business Programs)

2002-2003	$248,679.62
2003-2004	$949,191.09
2004-2005	$1,041,242.41
2005-2006	$1,111,581.83
2006-2007	$695,627.95
2007-2008	$486,734.28





Real Property Holdings - Gas and Oil Royalty Income

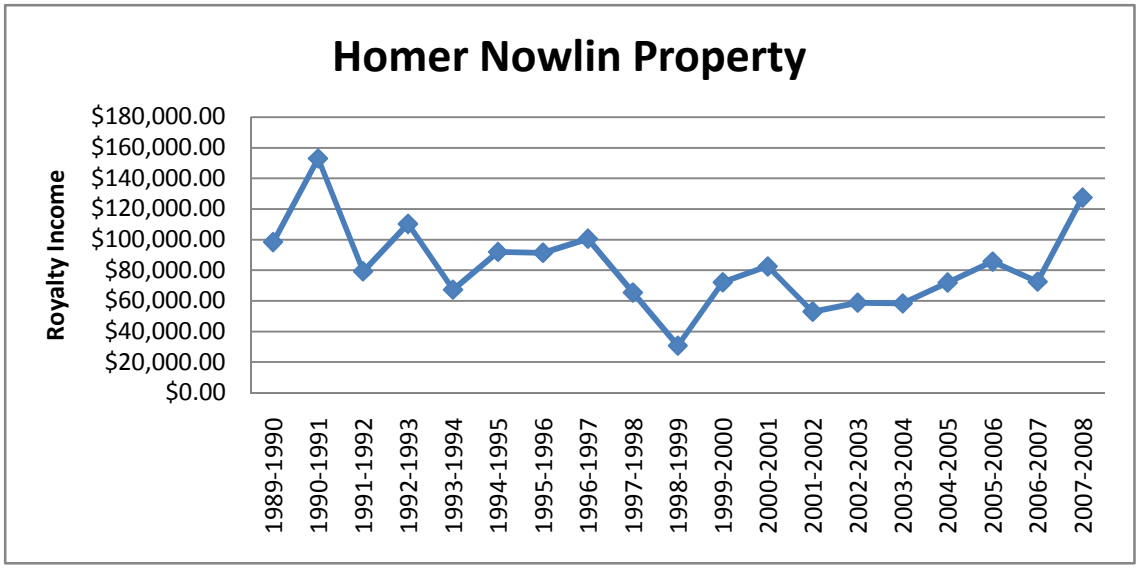
MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Homer Nowlin Property

(Income funds endowed chair in the College of Agriculture and Natural Resources)

1989-1990	$98,404.78
1990-1991	$153,008.72
1991-1992	$79,323.99
1992-1993	$110,311.26
1993-1994	$67,355.68
1994-1995	$91,965.81
1995-1996	$91,421.59
1996-1997	$100,641.83
1997-1998	$65,468.04
1998-1999	$30,788.53
1999-2000	$72,118.88
2000-2001	$82,535.99
2001-2002	$53,000.00
2002-2003	$58,819.50
2003-2004	$58,386.86
2004-2005	$71,997.24
2005-2006	$85,676.23
2006-2007	$72,534.18
2007-2008	$127,494.63



Real Property Holdings - Leased/Licensed Properties

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Leases of 10 years or longer require MSU Board of Trustee approval. The following leases meet that criteria. Only real property leases are included in the Real Property Holdings annual report.

MSU as TENANT	**ACRES**
Property: Trevor Nichols Research Complex (Kalamazoo Orchard site) Administrative Unit: College of Agriculture and Natural Resources Department of Entomology	45.000
Northwest Michigan Horticulture Research Station Administrative Unit: College of Agriculture and Natural Resources Department of Horticulture MSU Extension	100.000
Tollgate Education Center Administrative Unit: College of Agriculture and Natural Resources Land Management Office MSU Extension	100.000
Saginaw Valley Bean and Sugar Beet Research Farm Administrative Unit: College of Agriculture and Natural Resources Department of Crop and Soil Sciences	120.000
Total Leased Acres:	**365.000**

Real Property Holdings - Leased/Licensed Properties

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Leases of 10 years or longer require MSU Board of Trustee approval. The following leases meet that criteria. Only real property leases are included in the Real Property Holdings annual report.

TENANT	MSU PROPERTY	ACRES
Prairieville Township	Lux Arbor Reserve	0.800
Berrien County Extension Service	Southwest Michigan Research & Extension Center	1.380
Cass County Historical Commission	Fred Russ Forest	1.800
Cass County Park & Recreation Commission	Fred Russ Forest	14.000
Marcellus Community School	Fred Russ Forest	21.450
Department of Natural Resources	Dunbar Forest	9.400
Michigan State Police Headquarters	Campus	13.000
MSU Federal Credit Union	Campus	4.711
Sewage Plant	Campus	16.500
Consumers Energy	Campus	0.100
Northstar Cooperative, Inc.	Campus	9.710
University Rehabilitation Alliance	Campus	35.000
Candlewood/Vista I, LLC	Campus	3.235
Gull Lake Bible Conference	Kellogg Biological Station	10.000
Sheridan Lake YMCA (License)	Brook Lodge	415.000
Sheridan Lake YMCA (Lease)	Brook Lodge	40.000
Leland Township	Leland Property	0.700
Avon Players	VanHoosen Jones	1.793
	Total Acres Leased/Licensed to Others:	**598.579**

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Brook Lodge
Augusta, Kalamazoo County

Purpose	Status	Acres
Conference center, teaching, research, and outreach	Active	633.240

Administrator	Comment
Kellogg Center Land Management Office	Long term lease on 40 acres to Sherman Lake YMCA

Clarksville Horticultural Experiment Station
Clarksville, Ionia County

Purpose	Status	Acres
Horticulture research on small fruit and tree fruit	Active	440.000

Administrator	Comment
Department of Horticulture Land Management Office	Agricultural Research Station Coordinator: Philip Schwallier Farm Manager: Gerald Skeltis

Dobie Road
Okemos, Ingham County

Purpose	Status	Acres
Wildlife research	Active	114.431

Administrator	Comment
Department of Fisheries & Wildlife Land Management Office	Location of WKAR tower T-Mobile tower

Dunbar Forest Experiment Station
Sault Ste. Marie, Chippewa County

Purpose	Status	Acres
Forest research and demonstration	Active Title restricted on 4,668.84 acres Land reverts to State if not used solely for forestry purposes	5,759.815

Administrator	Comment
Department of Forestry Land Management Office	None

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Hidden Lake Gardens
Tipton, Lenawee County

Purpose	Status	Acres
Arboretum and plant conservatory	Active	756.618

Administrator	Comment
Land Management Office	Manager: Steven Courtney

Human Medicine, College of
Grand Rapids, Kent County

Purpose	Status	Acres
Medical School	Active	1.740

Administrator	Comment
College of Human Medicine	Includes Condominium #5

Hulett Road Engineering
Okemos, Ingham County

Purpose	Status	Acres
Former facilities and site for College of Engineering research	Property is for sale Building vacant	5.691

Administrator	Comment
Land Management Office	None

Jolly Road Engineering
Okemos, Ingham County

Purpose	Status	Acres
Facilities and site for College of Engineering research	Active	3.260

Administrator	Comment
College of Engineering Land Management Office	None

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Kellogg, W.K. Biological Station
(Including Farm and Bird Sanctuary)
Hickory Corners, Kalamazoo County

Purpose	Status	Acres
Teaching, research, and extension activities in the environmental sciences focusing on the interdependence of natural and managed landscapes. The programs treat integrated study of biology, wildlife, and production agriculture, including animal input.	Active Title on original gift restricted. Property needs to be maintained and operated for educational purposes.	1,685.930

Administrator	Comment
Director, Biological Station College of Agriculture & Natural Resources College of Natural Science Land Management Office	Agricultural Research Station Director: Dr. Katherine Gross Farm Manager: Jim Bronson Bird Sanctuary Coordinator: Tracey Kast Farm Acreage: 939.754 Bird Sanctuary Acreage: 746.176

Kellogg, W.K. Biological Station
Lux Arbor Reserve
Delton, Barry County

Purpose	Status	Acres
Research and education in the agricultural, biological, botanical, and horticulture sciences	Active	1,323.000

Administrator	Comment
Same as Kellogg Biological Station	Included with Kellogg Biological Station as an Agricultural Research Station Farm Manager: Steve Norris

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Kellogg, W.K. Experimental Forest
Augusta, Kalamazoo County

Purpose	Status	Acres
Forestry research, teaching, demonstration, and public use	Active Title restricted on 280 acres. To be used for reforestation, education, and experimental purposes	715.995

Administrator	Comment
Department of Forestry Land Management Office	Agricultural Research Station Coordinator: Dr. David McFarlane Resident Forester: Greg Kowalewski

Lake City Experiment Station
Lake City, Missaukee County

Purpose	Status	Acres
Research in beef cattle, forages, and potatoes	Active Title restricted	810.010

Administrator	Comment
Department of Animal Science Land Management Office	Agricultural Research Station Coordinator: Dr. Dan Buskirk Farm Manager: Doug Carmichael

Leland Property
Leland, Leelanau County

Purpose	Status	Acres
Long-term lease to Leland Township	Active	0.700

Administrator	Comment
Land Management Office	None

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

MacCready Forest and Wildlife Reserve
Clark Lake, Jackson County

Purpose	Status	Acres
Wildlife and forestry demonstration	Active	408.000

Administrator	Comment
Department of Forestry Department of Fisheries & Wildlife Land Management Office	None

Management Education Center
Troy, Oakland County

Purpose	Status	Acres
Advanced management training center	Active	24.327

Administrator	Comment
College of Business	None

Martin Property (Rose-Dell Seed Orchard)
Calhoun County

Purpose	Status	Acres
Tree seed orchard and demonstration site	Active Proceeds from leases and timber sales to be used for farm maintenance and scholarships	160.000

Administrator	Comment
Department of Forestry Land Management Office	

Mason Research Farm
Mason, Ingham County

Purpose	Status	Acres
Cereal grains and soybean research	Active	117.000

Administrator	Comment
Department of Crop & Soil Sciences Land Management Office	None

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Michigan State University Campus
East Lansing, Ingham County

Purpose	Status	Acres
Research, education, and outreach	Active	5195.225

Montcalm Experimental Farm
Lakeview, Montcalm County

Purpose	Status	Acres
Potato production research and cash crops	Active	57.250

Administrator	Comment
Department of Crop & Soil Sciences	Agricultural Research Station
Land Management Office	Coordinator: Dr. Dave Douches
	Farm Manager: Bruce Sackett

MSU Sailing Club
Haslett, Ingham County

Purpose	Status	Acres
Sailing and wind surfing lessons	Active	0.760

Administrator	Comment
Intramural Sports and Recreative Services	None

Muck Soils Research Farm
Laingsburg, Clinton County

Purpose	Status	Acres
Organic soil vegetable and crops research	Not recommended to sell	447.048
	Active	

Administrator	Comment
Department of Crop & Soil Sciences	Agricultural Research Station
Land Management Office	Coordinator: Dr. Darryl Warncke
	Farm Manager: Ron Gnagey

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Pfizer Property
Holland, Ottawa County

Purpose	Status	Acres
	Active	6.300
	Land use or resource use restrictions	

Administrator	Comment
Vice President for Research and Graduate Studies	None

River Terrace Property
East Lansing, Ingham County

Purpose	Status	Acres
Investment	Active	1.210

Administrator	Comment
Land Management Office	None

Rogers Reserve
Jackson, Jackson County

Purpose	Status	Acres
Botantical and horticultural sciences research and teaching	Active	115.850

Administrator	Comment
Department of Plant Pathology Land Management Office	Coordinator: Dr. Dennis Fulbright

Russ Forest Experiment Station
Decatur, Cass County

Purpose	Status	Acres
Forestry plantings and genetics research	Active	938.750
Demonstration and public use	Title restricted on 269 acres	
	Land to be used for educational purposes	

Administrator	Comment
Department of Forestry	Agricultural Research Station
Land Management Office	Coordinator: Dr. David MacFarlane
	Non-Resident Forestor: Greg Kowalewski

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Southwest Michigan Research and Extension Center
Benton Harbor, Berrien County

Purpose	Status	Acres
Horticultural research and extension center	Active	350.000

Administrator	Comment
Department of Horticulture	Agricultural Research Station
Cooperative Extension Service	Coordinator: Dr. Thomas Zabadal
Land Management Office	Farm Manager: Dave Francis

Stranahan-Bell (WaWaSum)
Grayling, Crawford County

Purpose	Status	Acres
Inland stream and reforestation research	Active	251.000
Small conference center		

Administrator	Comment
Land Management Office	None

Sycamore Creek
Holt, Ingham County

Purpose	Status	Acres
Support campus water management plan;	Active	54.500
controlled access to Sycamore Creek flood	Title restricted on 52 acres	
plain	Deed covenants restrict use	

Administrator	Comment
Land Management Office	None

Tollgate Education Center
Novi, Oakland County

Purpose	Status	Acres
Agricultural and environmental	Active	56.675
education and leadership training		

Administrator	Comment
Cooperative Extension Service	Farm Manager: Roy Prentice
Land Management Office	

Real Property Holdings - Inventory

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Trevor Nichols Research Complex
Fennville, Allegan County

Purpose	Status	Acres
Fruit pest research	Active	156.100

Administrator	Comment
Department of Entomology	Agricultural Research Station
Land Management Office	Coordinator: Dr. John Wise
	Farm Manager: Matt Daly

Upper Peninsula Experiment Station
Chatham, Alger County

Purpose	Status	Acres
Dairy, forestry, and crops research	Active	1,262.227

Administrator	Comment
Department of Animal Science	Agricultural Research Station
Land Management Office	Coordinator: Dr. Herb Bucholtz
	Farm Manager: Paul Naasz

Upper Peninsula Tree Improvement Center
Escanaba, Delta County

Purpose	Status	Acres
Research and demonstration in forestry and crops	Active	1,737.260

Administrator	Comment
Department of Forestry	Coordinator: Dr. David McFarlane
Land Management Office	Resident Forester: Dr. Ray Miller

VanHoosen Property
Rochester, Oakland County

Purpose	Status	Acres
Long-term lease to Avon Players	Active	1.793

Administrator	Comment
Vice President for Finance and Operations	Remaining land of Sarah
Land Management Office	Van Hoosen gift acquired in 1956

Total Acres: 23,591.705

Real Property Holdings - Agricultural Research Stations

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Agricultural Research Stations owned by MSU

Clarksville Horticultural Experiment Station
9302 Portland Road
Clarksville, MI 48815

Dunbar Forest Experiment Station
12839 S. Scenic Drive
Sault Ste. Marie, MI 49783

Kellogg, W.K. Biological Station
3700 E. Gull Lake Drive
Hickory Corners, MI 49060

Kellogg, W.K. Experimental Forest
7060 N. 42nd Street
Augusta, MI 49012

Lake City Experiment Station
5401 W. Jennings Road
Lake City, MI 49651

Montcalm Experimental Farm
4747 McBride Road
Lakeview, MI 48850

Muck Soils Research Farm
Route 3
9370 E. Herbison Road
Laingsburg, MI 48848

Russ Forest Experiment Station
20673 Marcellus Highway
Decatur, MI 49045

Southwest Michigan Research and Extension Center
1781 Hillandale Road
Benton Harbor, MI 49022

Trevor Nichols Research Complex
6237 124th Avenue
Fennville, MI 49408

Upper Peninsula Experiment Station
E3774 University Drive
P.O. Box 168
Chatham, MI 49816

Upper Peninsula Tree Improvement Center
6005 J. Road
Escanaba, MI 49829

Agricultural Research Stations leased by MSU

Northwest Michigan Horticultural Experiment Station
6686 S. Center Highway
Traverse City, MI 49684

Saginaw Valley Bean and Sugar Beet Research Farm
3066 S. Thomas Road
Saginaw, MI 48603

Real Property Holdings - Land Acquisition by Decade

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

	Acres	
	Campus	**Off-Campus**
Prior to 1920	1,026.380	1,060.327
1920's	564.350	2,007.112
1930's	284.614	795.026
1940's	1,605.236	6,281.322
1950's	1,266.862	862.190
1960's	767.850	2,417.390
1970's	188.747	861.049
1980's	13.943	3,265.245
1990's	66.338	1,775.765
2000's	1.069	1,057.430

Real Property Holdings - Land Available for Agricultural Research

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

Off-Campus	**Acres**
12 Outlying Stations (owned)	15,683.385
2 Outlying Stations (leased)	220.000
Dobie Road Property, Okemos	114.431
Off-Campus owned land used for agricultural research (Not designated as a research station)	1,106.350
Off-Campus leased land used for agricultural research (10 years or longer)	365.000
Campus	
Land used for agricultural research - south of Mt. Hope	2,734.149
Total Acres:	**20,223.315**

Real Property Holdings - Warranty Deeds to State Building Authority

MICHIGAN STATE UNIVERSITY

As of July 1, 2008

The following parcels have been or will be deeded to and leased back from the State Building Authority, for financing pursuant to earlier Board of Trustees approval.

- Anthony Hall Dairy Plant and Meats Lab
- Biomedical and Physical Sciences Building
- Diagnostic Center for Population and Animal Health

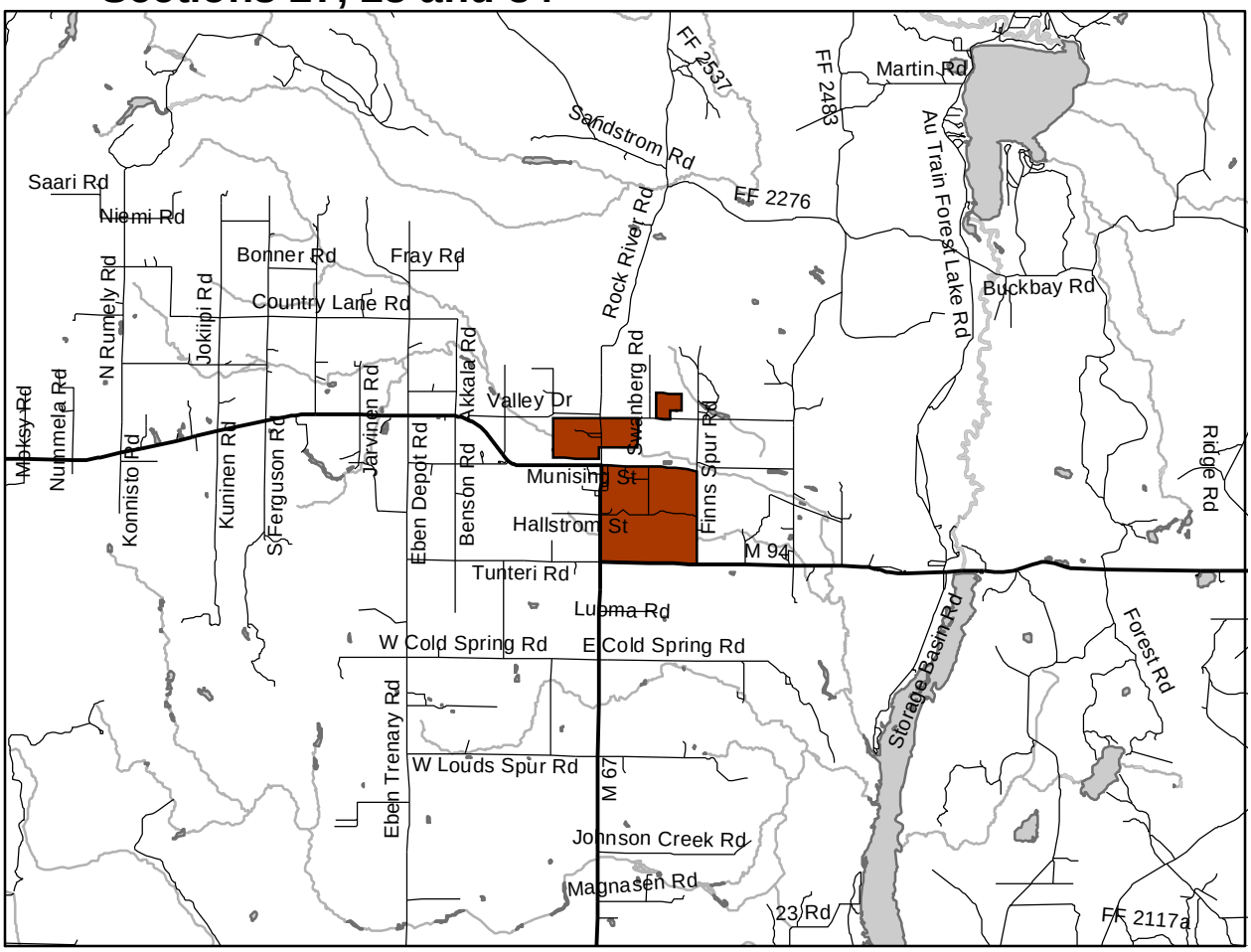
The following parcels have been deeded to the State of Michigan, pursuant to Board of Trustees approval, in connection with a State of Michigan financing of improvements. A written agreement obligates the State to deed the property back to MSU at a later date.

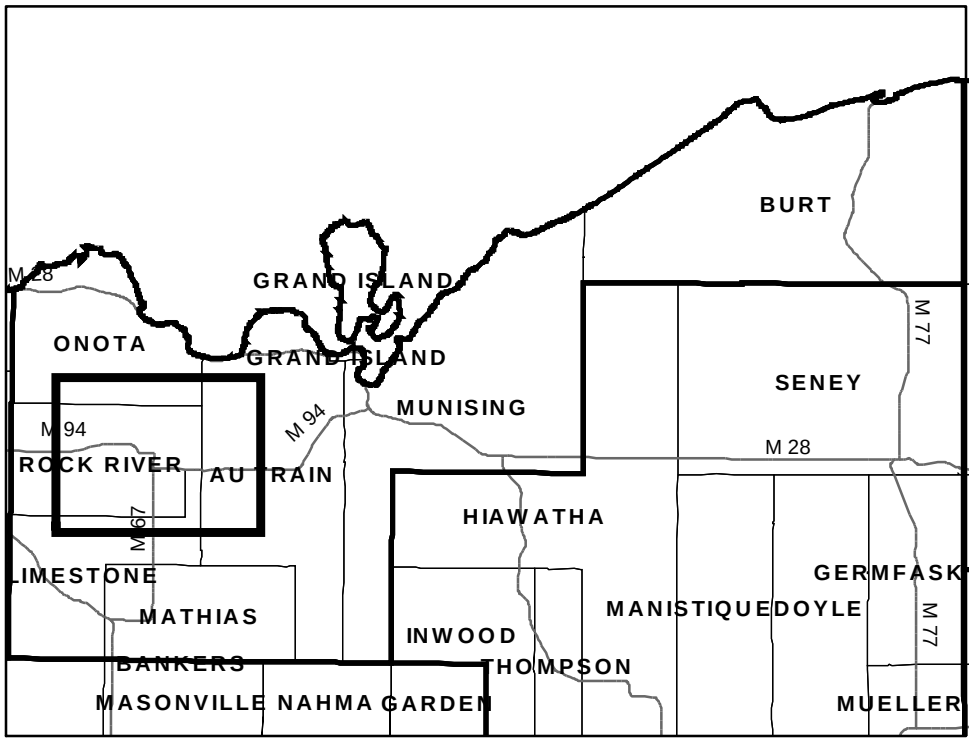
- The Geagley Laboratory

Location Maps
of
Michigan State University Properties
Alphabetical by County

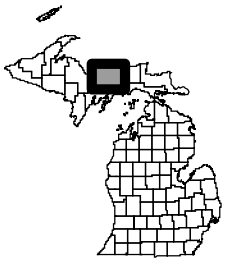
Upper Peninsula Experiment Station

Alger County, City of Chatham and Rock River Township, Sections 27, 28 and 34



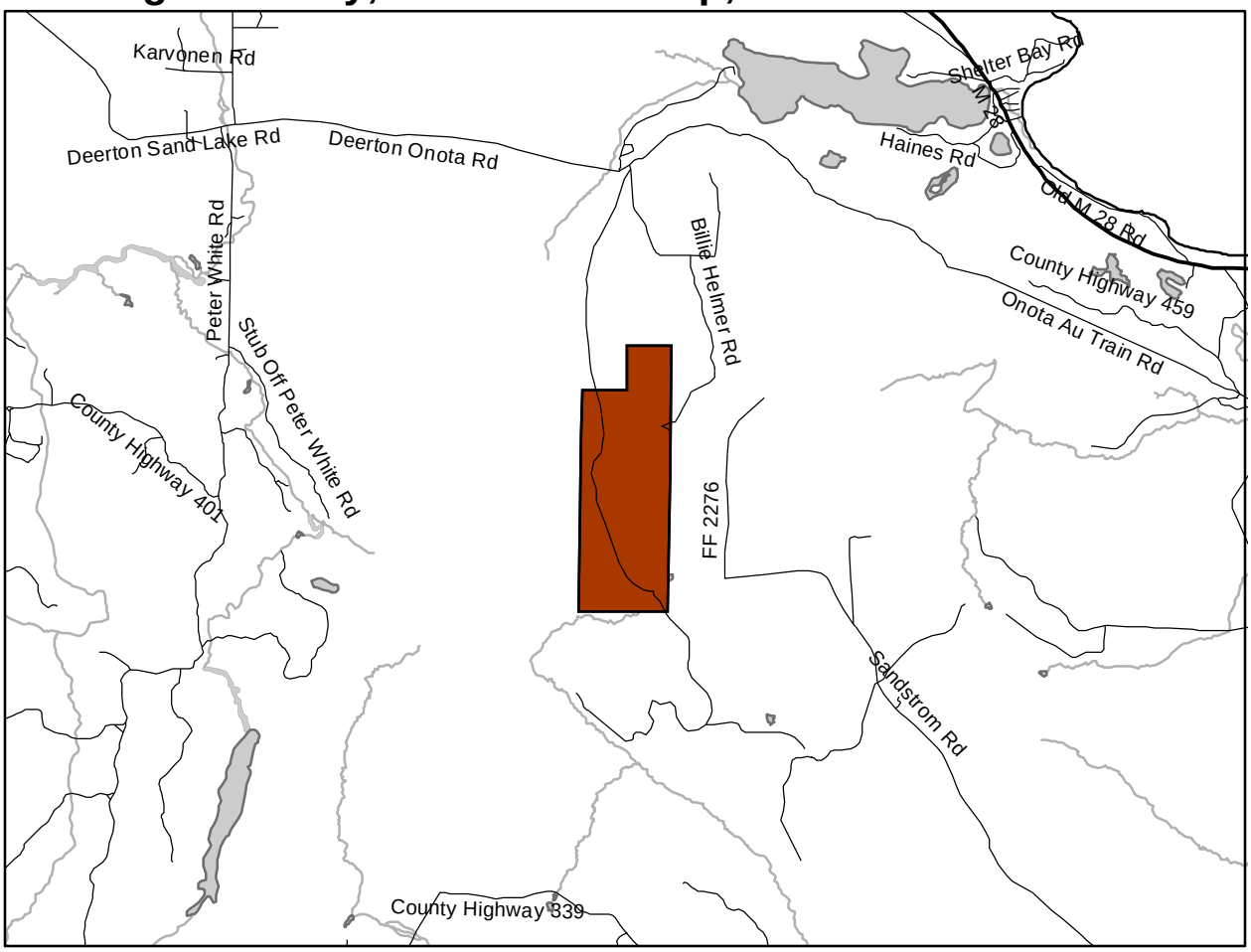


County Locator
Alger County



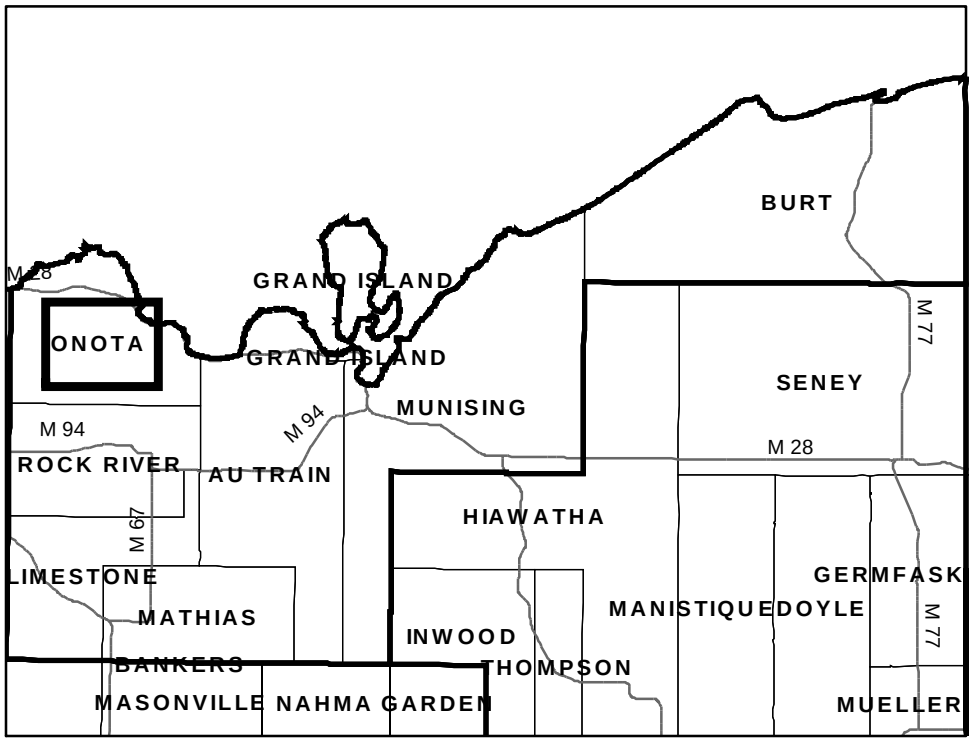
Jim Wells Forest

Alger County, Onota Township, Sections 24 and 25



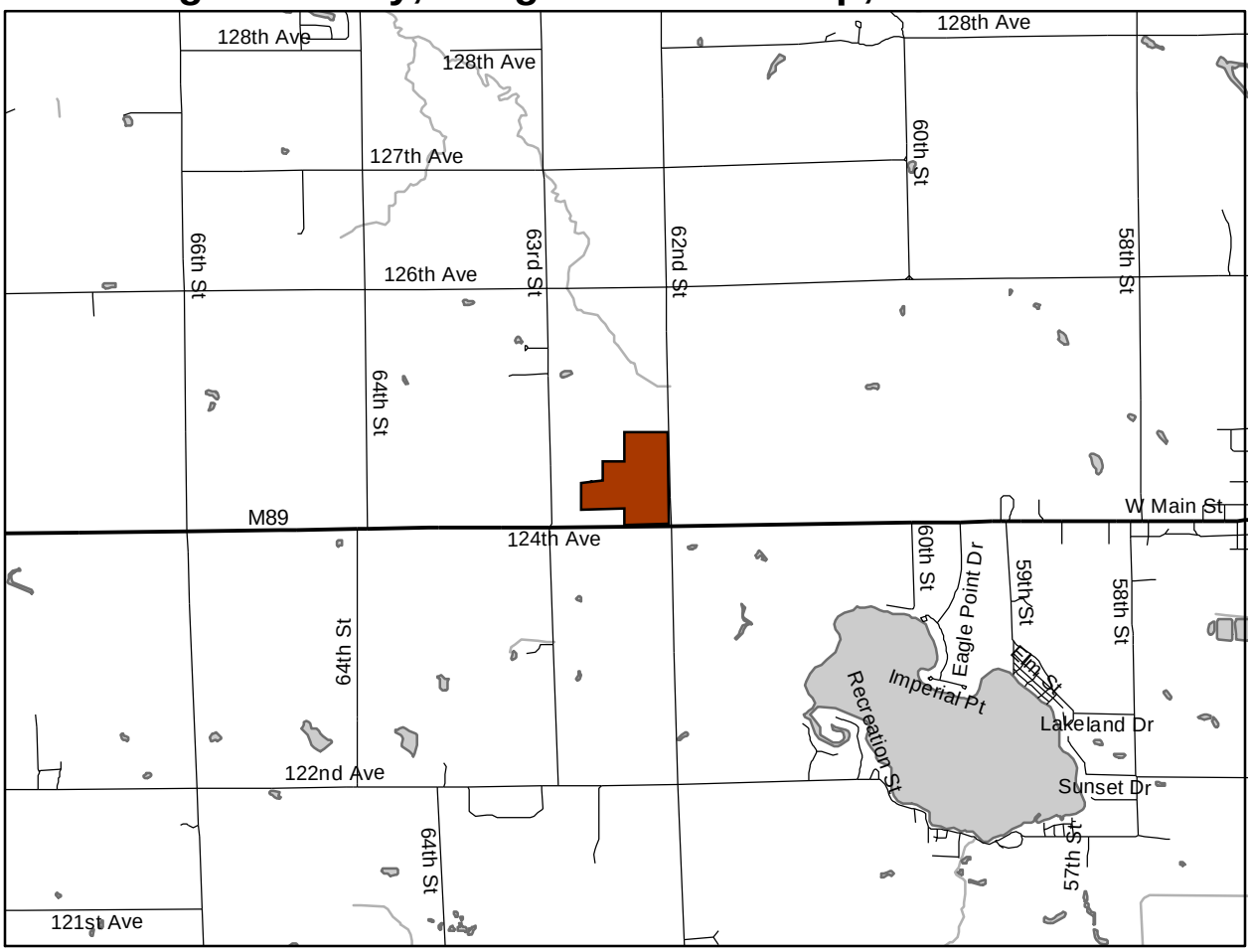
County Locator

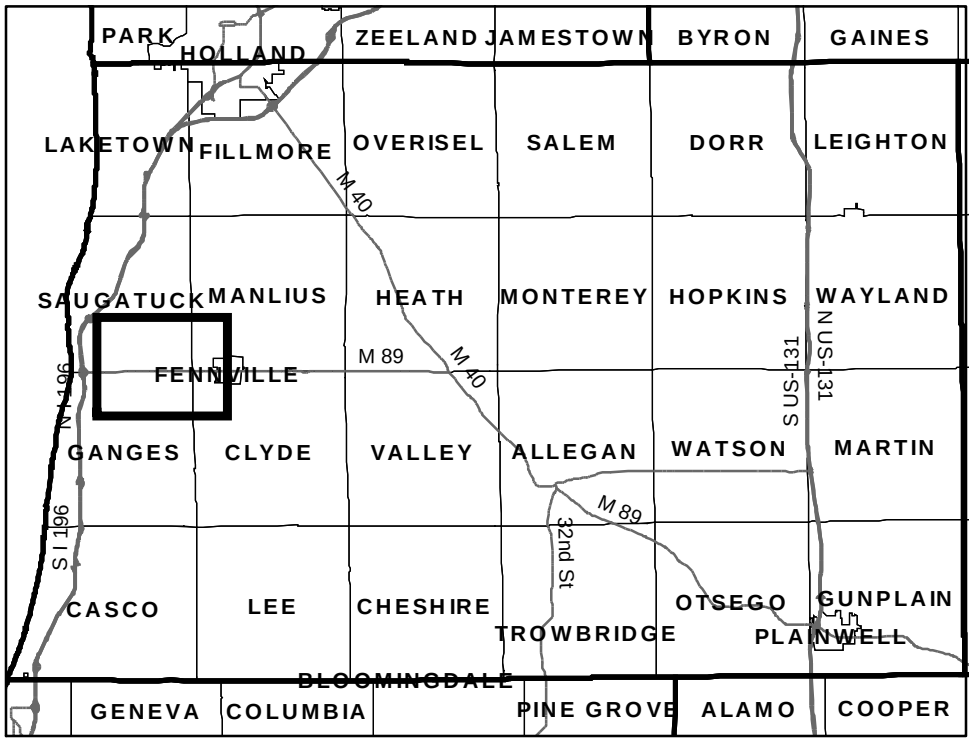
Alger County



Trevor Nichols Research Complex

Allegan County, Saugatuck Township, Section 35



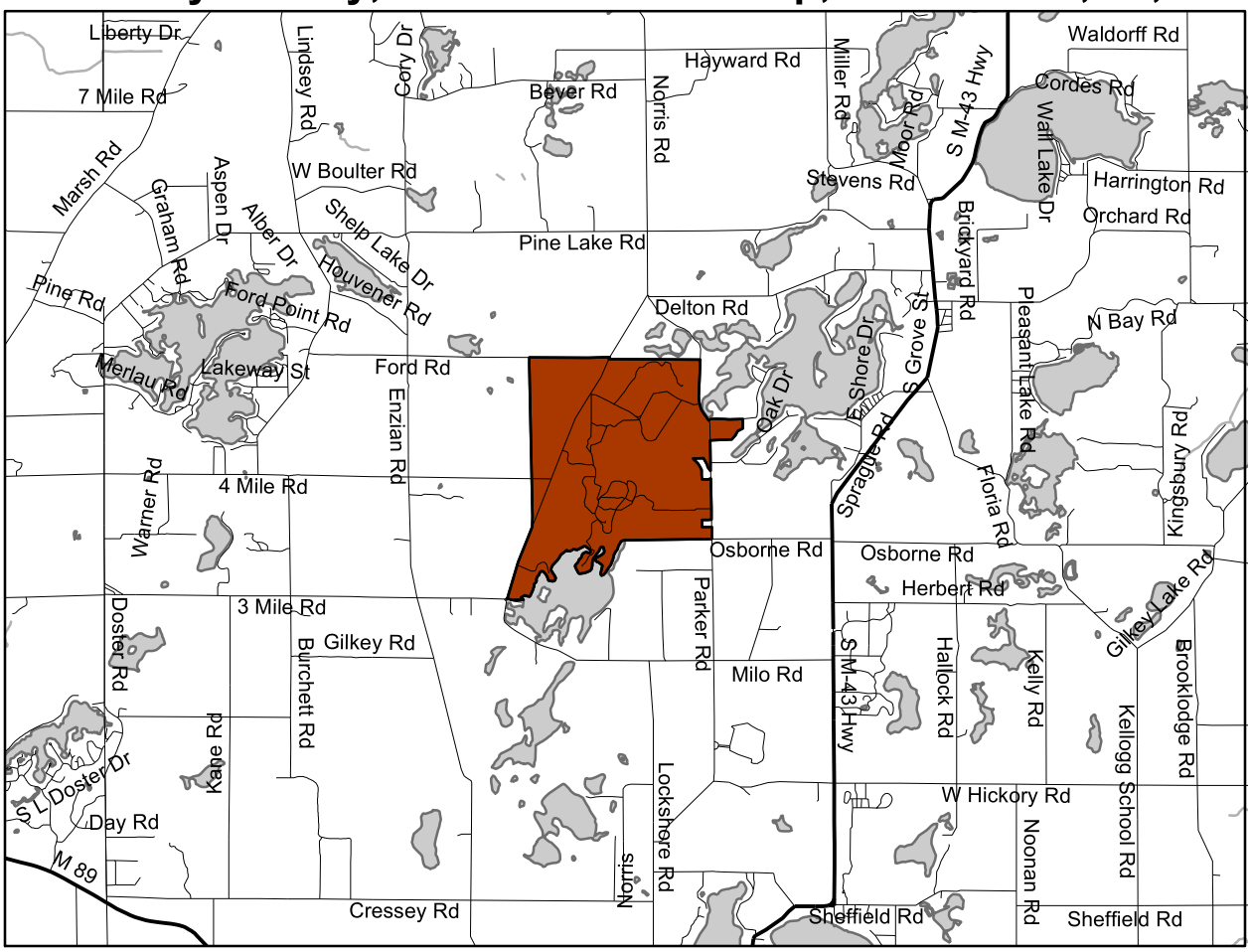


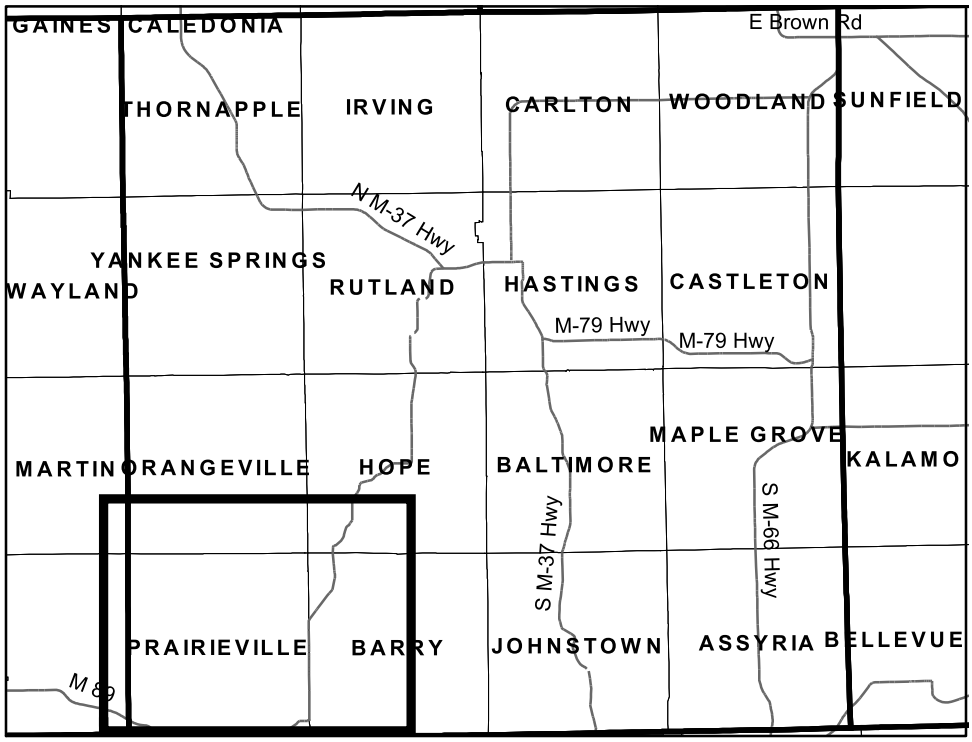
County Locator

Allegan County

W.K. Kellogg Biological Station (Lux Arbor Reserve)

Barry County, Prairieville Township, Sections 10, 11, 14 and 15



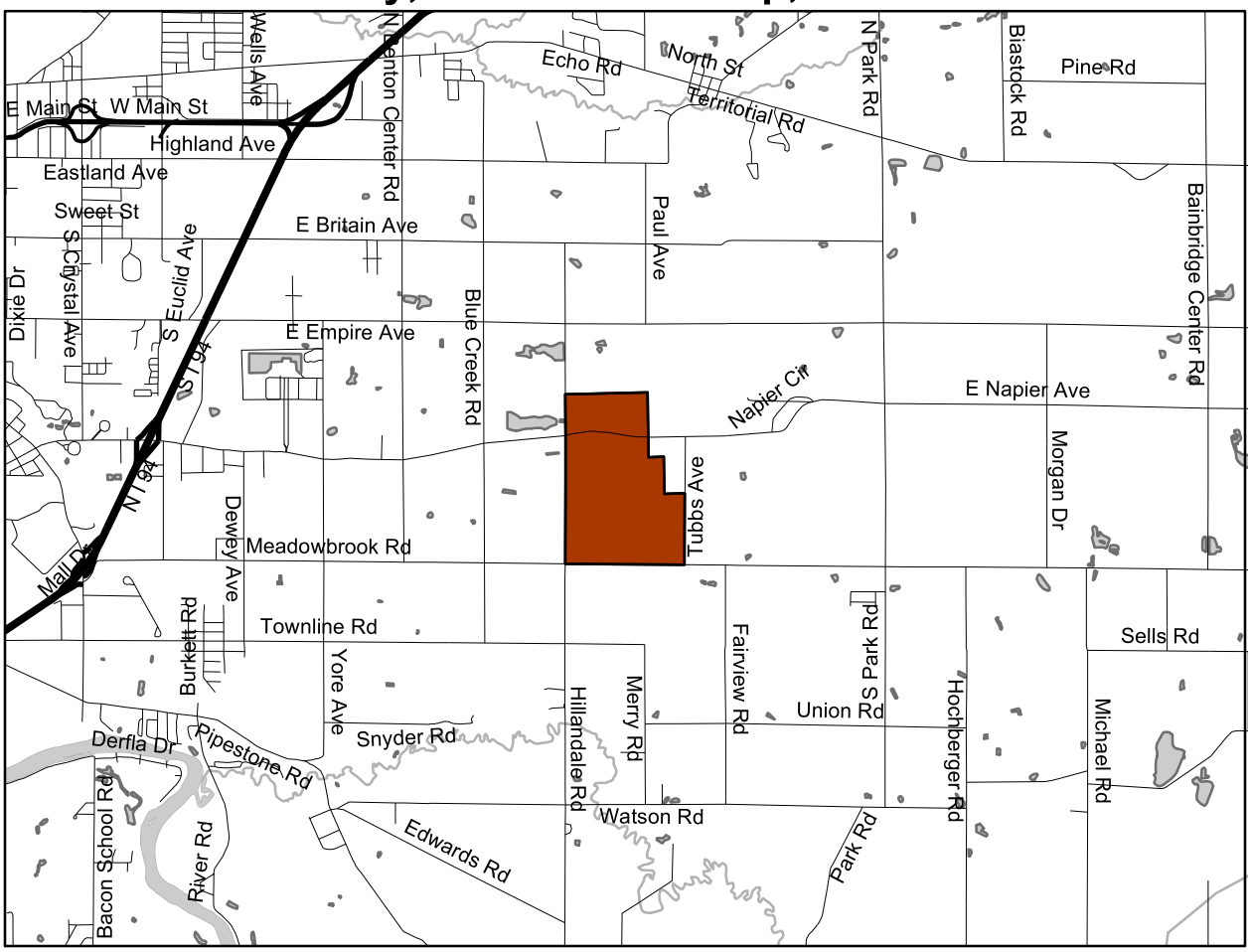


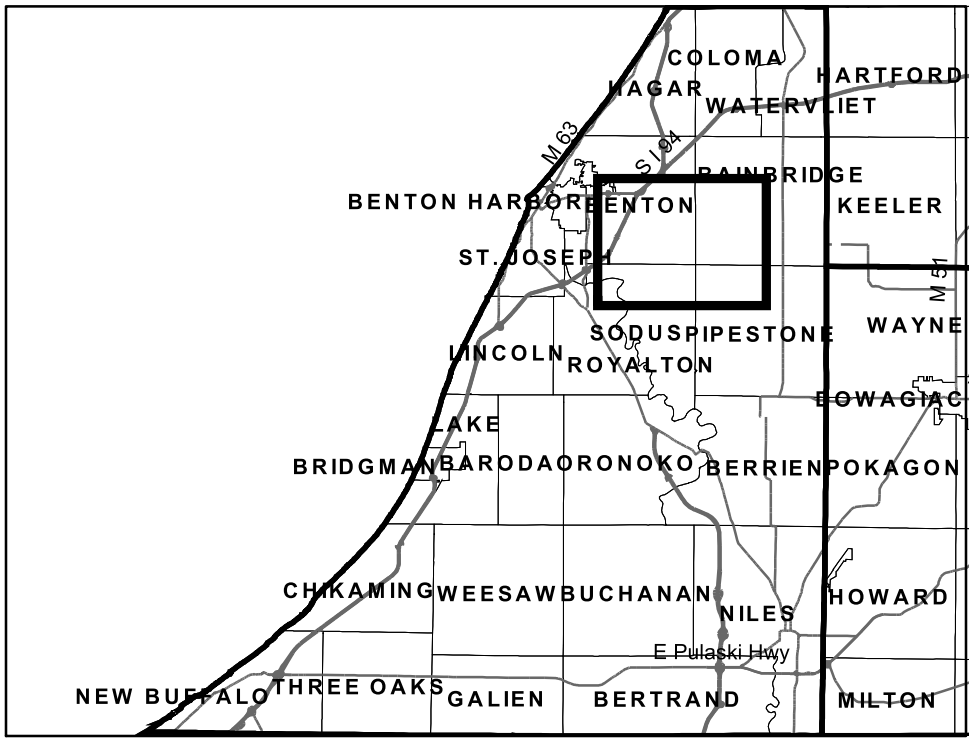
County Locator

Barry County

Southwest Michigan Research and Extension Center

Berrien County, Benton Township, Sections 25 and 36



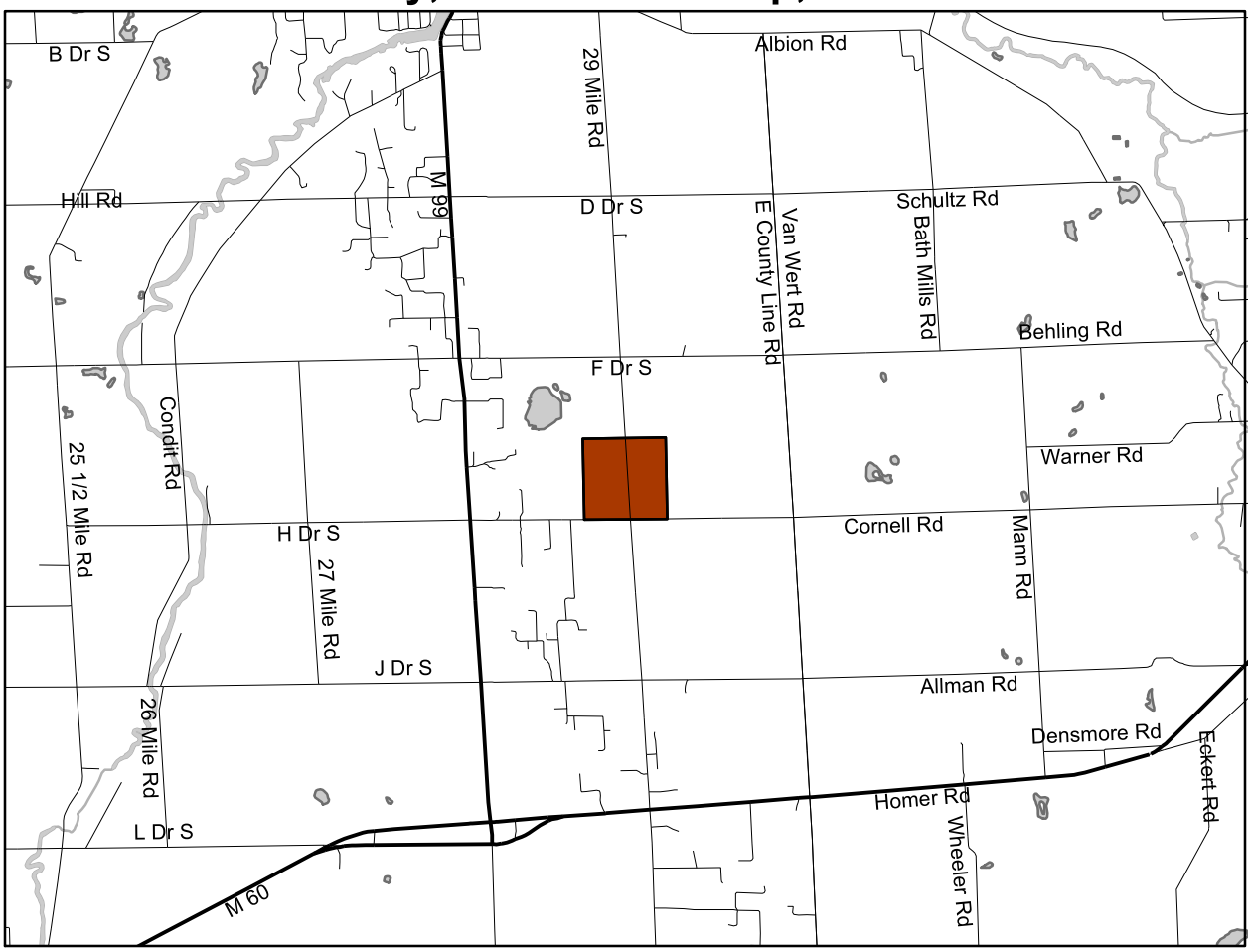


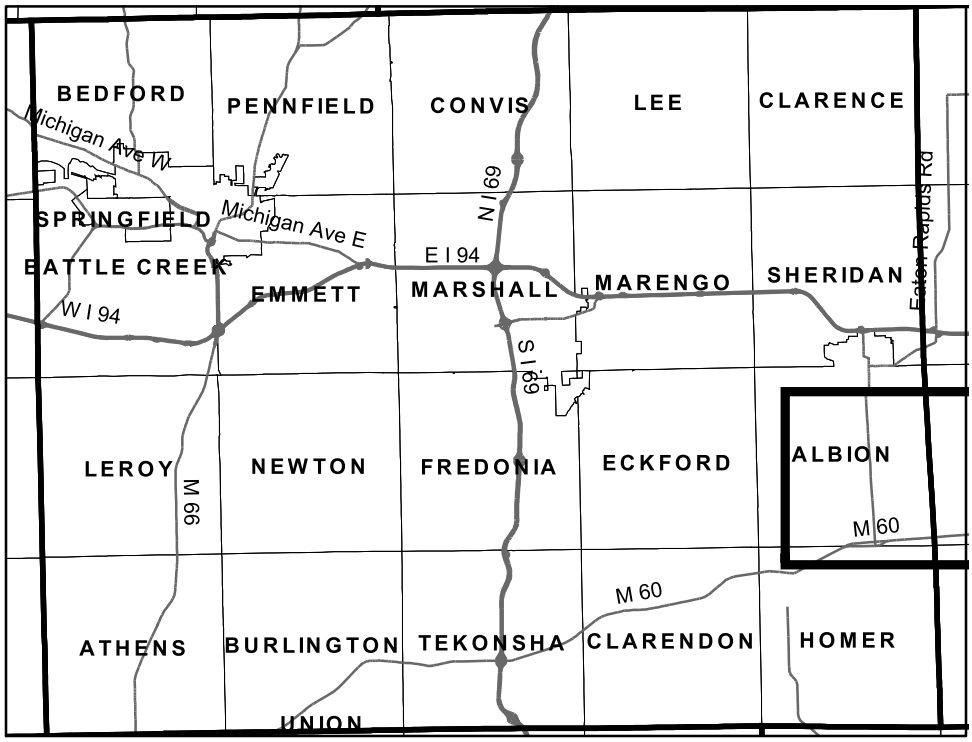
County Locator

Berrien County

Rose-Dell Seed Orchard Research Facility

Calhoun County, Albion Township, Sections 23 and 24



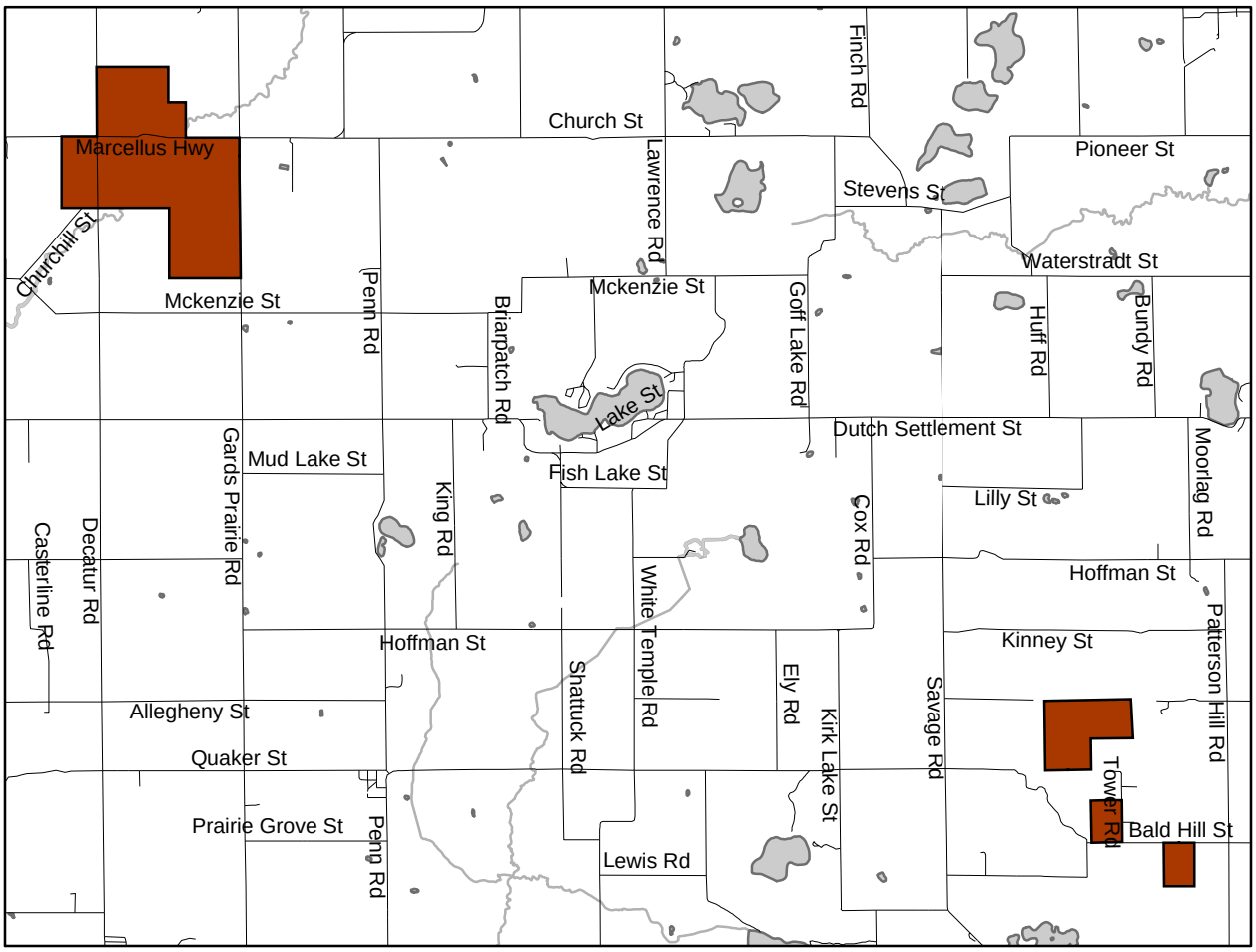


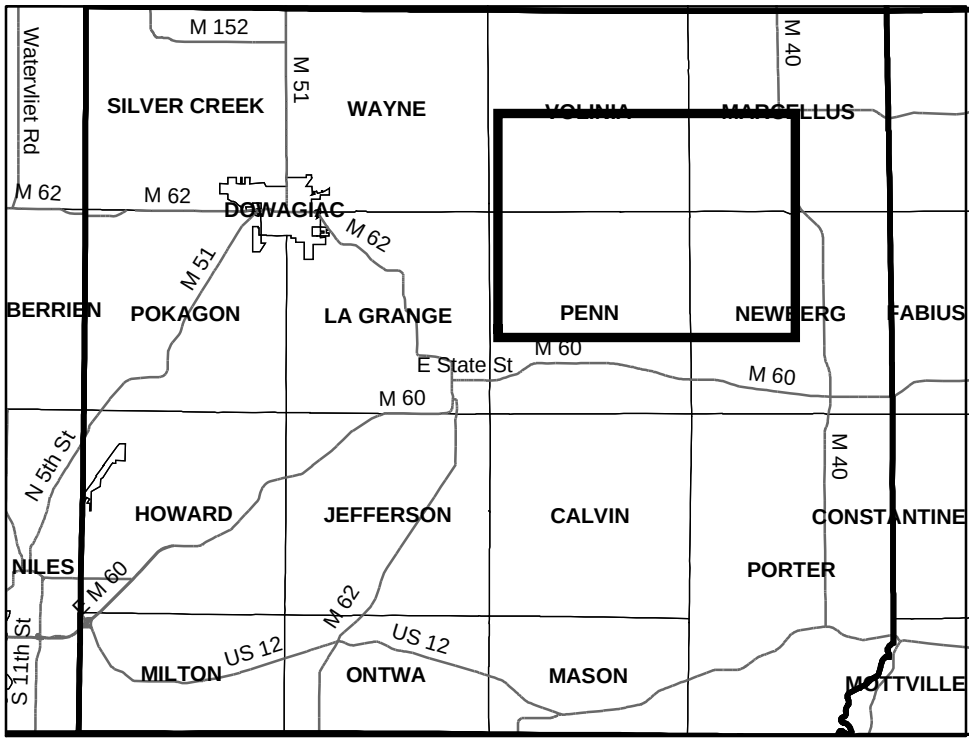
County Locator

Calhoun County

Fred Russ Forest Experiment Station

Cass County, Newberg Township, Sections 16, 17, and 21; Volinia Township, Sections 20, 29 and 30



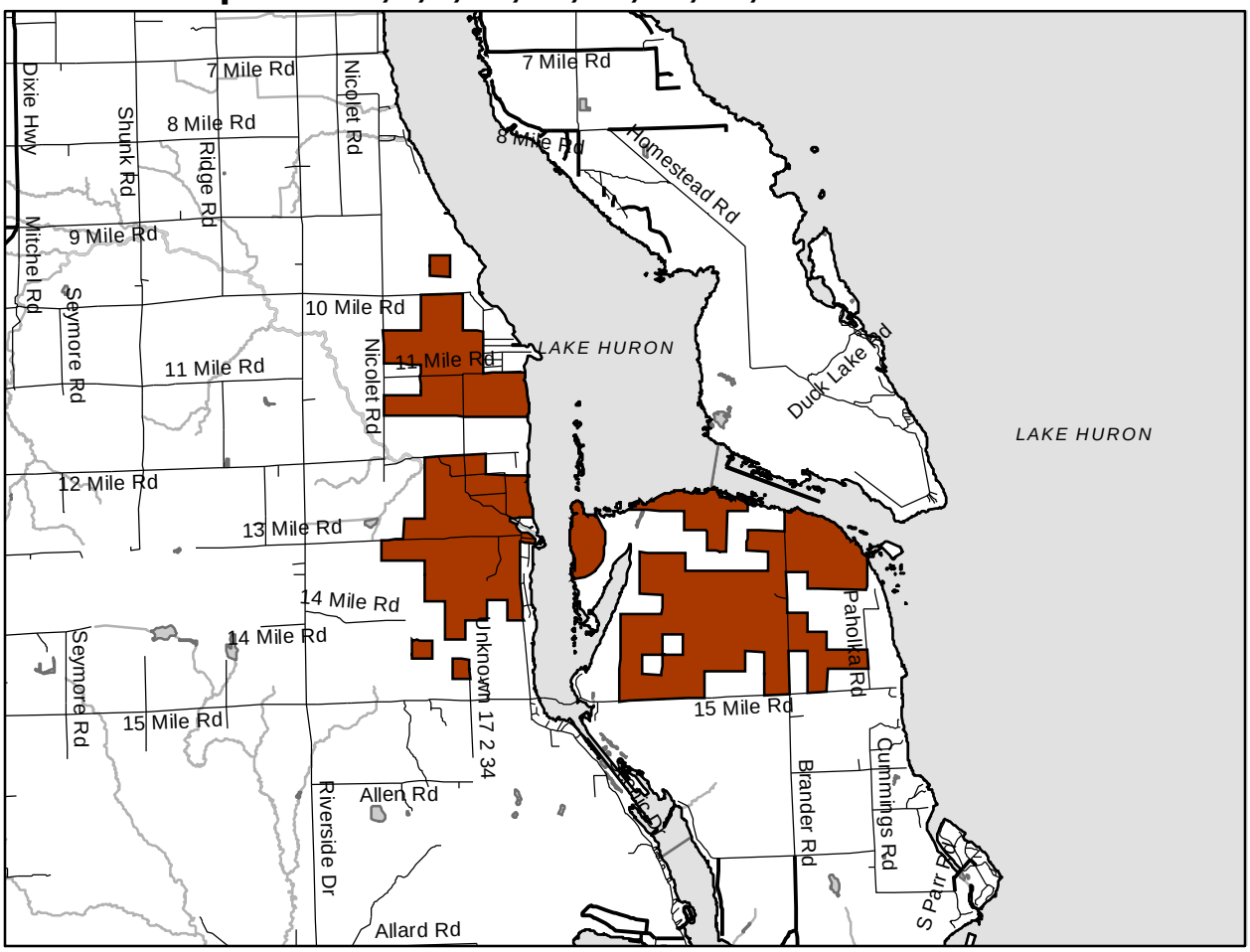


County Locator

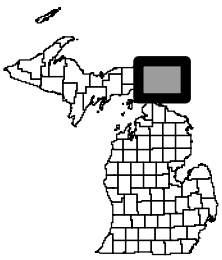
Cass County

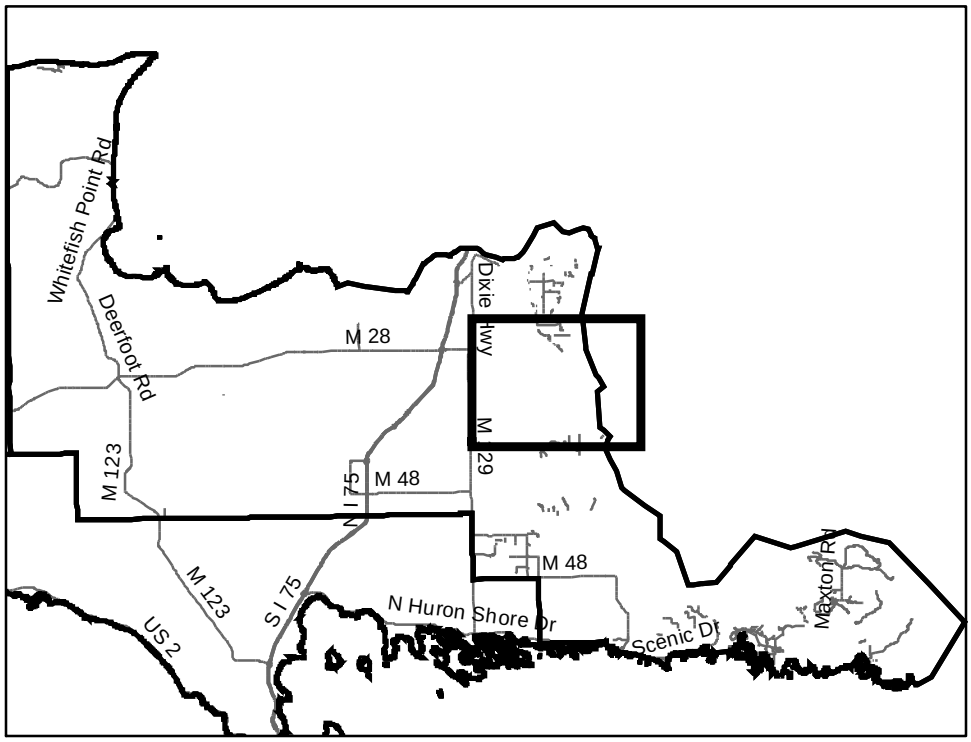
Dunbar Forest Experiment Station

Chippewa County, Soo Twp. Sec,3,4,5,8,9,10,11,14,15 and 16; Bruce Twp. Sec.1,6,7,12,13,24,25,30,31 and 36



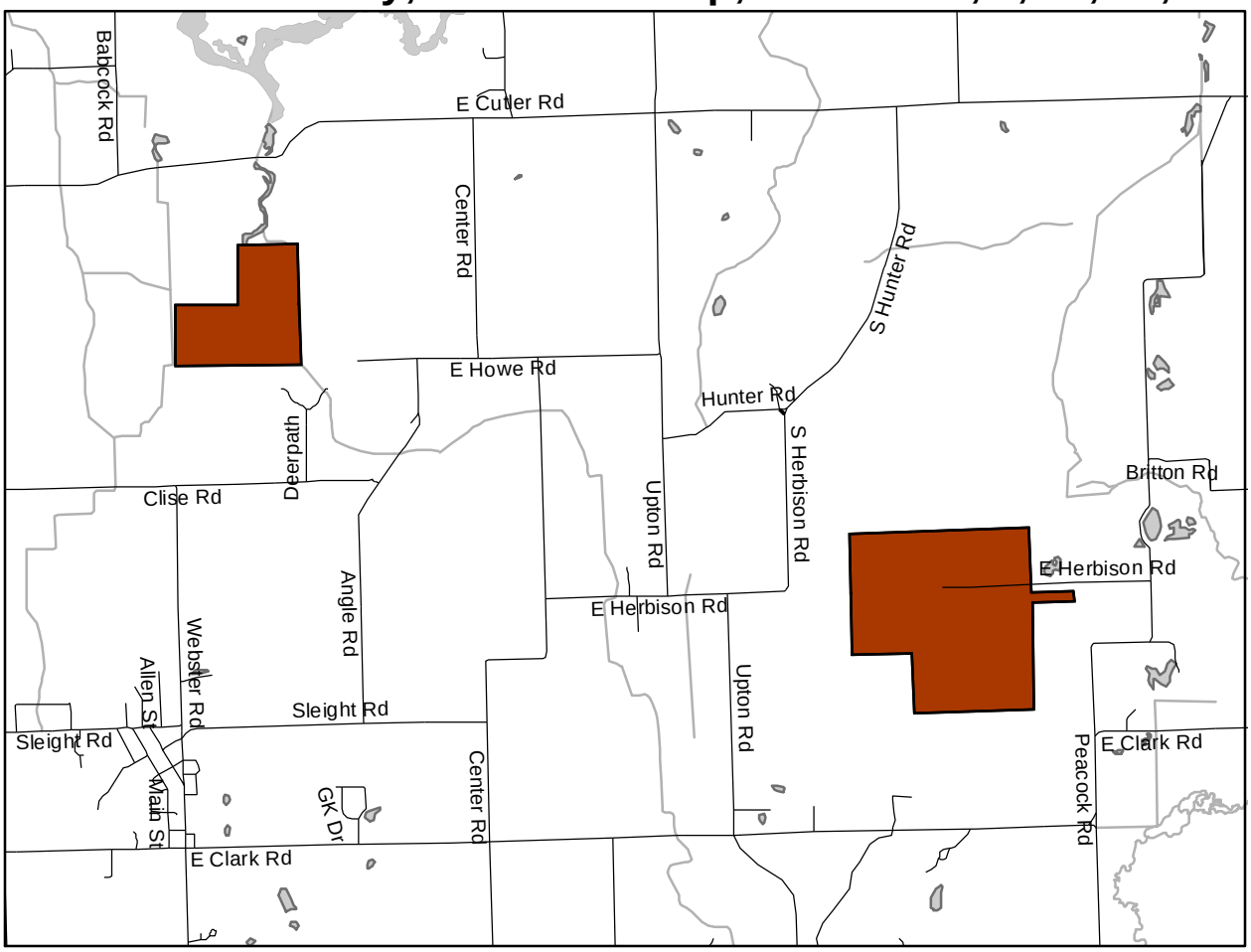
County Locator
Chippewa County

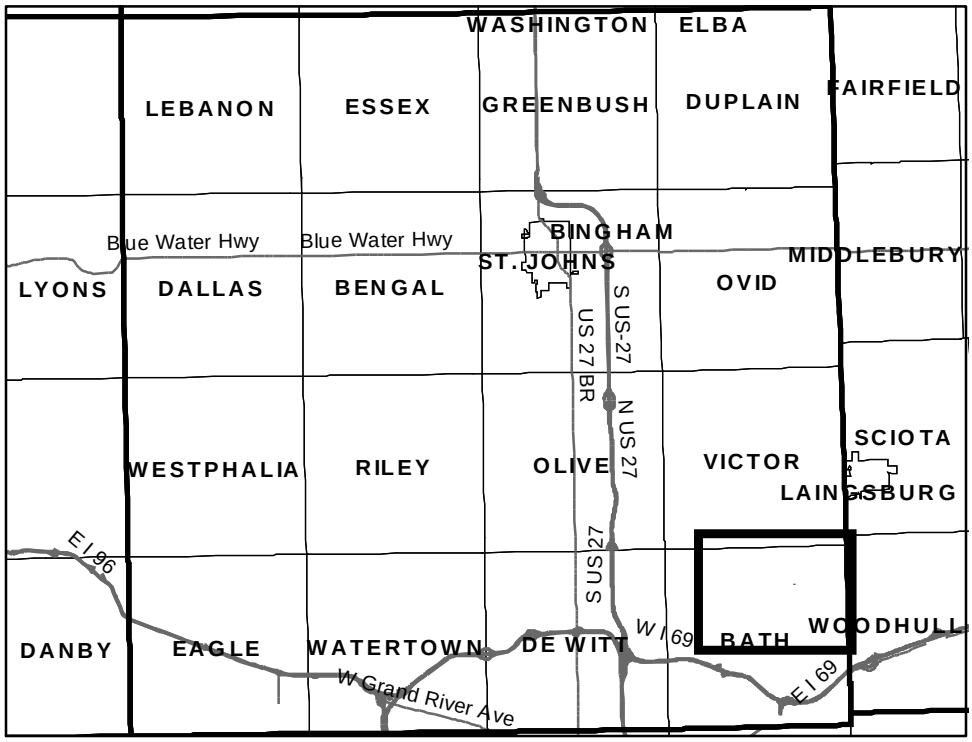




Muck Soils Research Farm

Clinton County, Bath Township, Sections 4, 5, 11, 12, 13 and 14



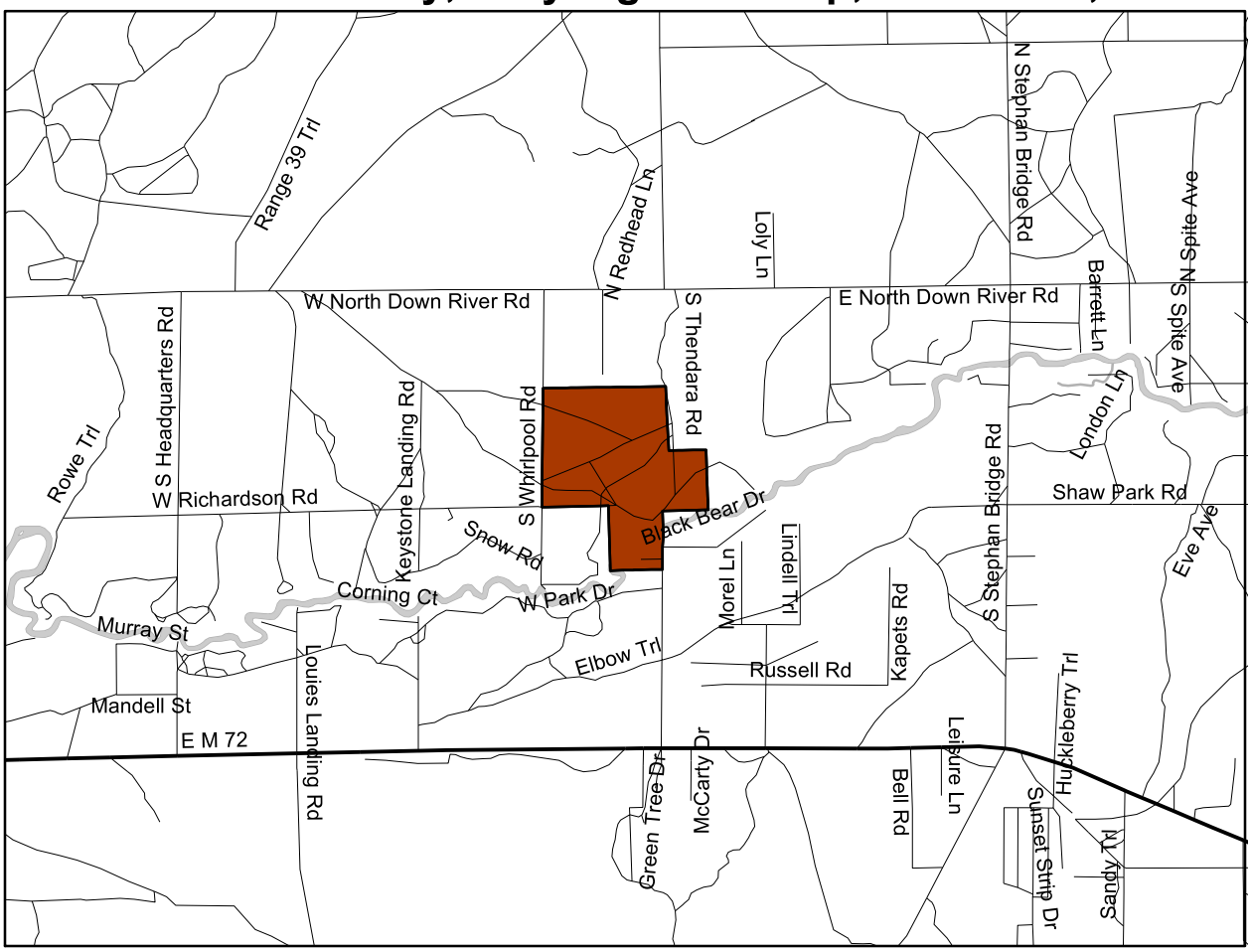


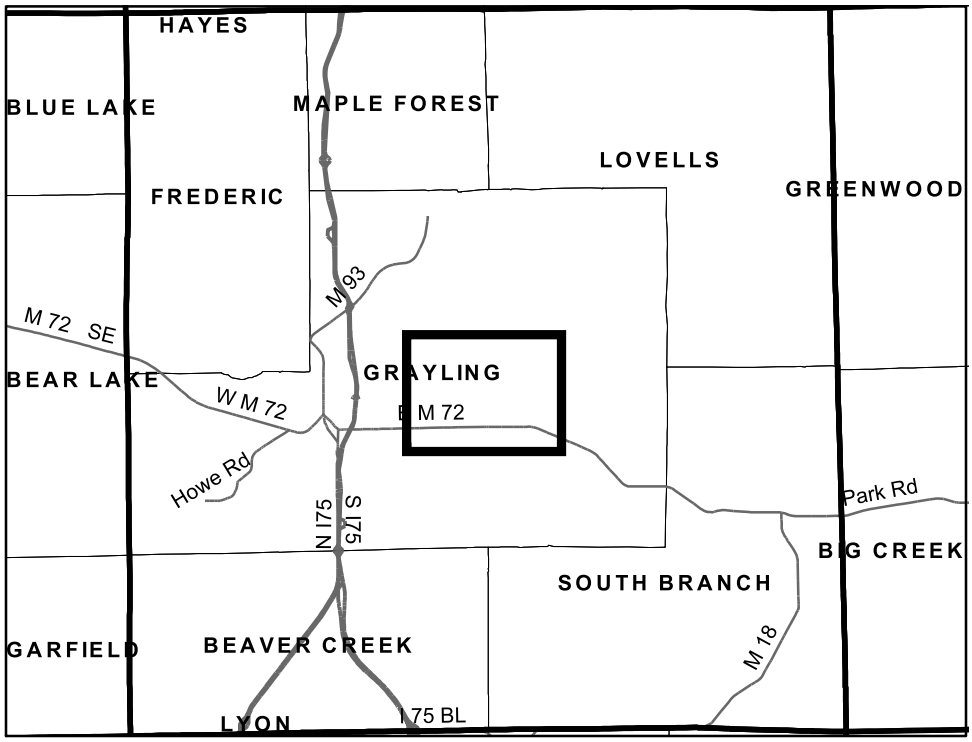
County Locator

Clinton County

Stranahan-Bell Property (Wa Wa Sum)

Crawford County, Grayling Township, Sections 1, 6 and 12



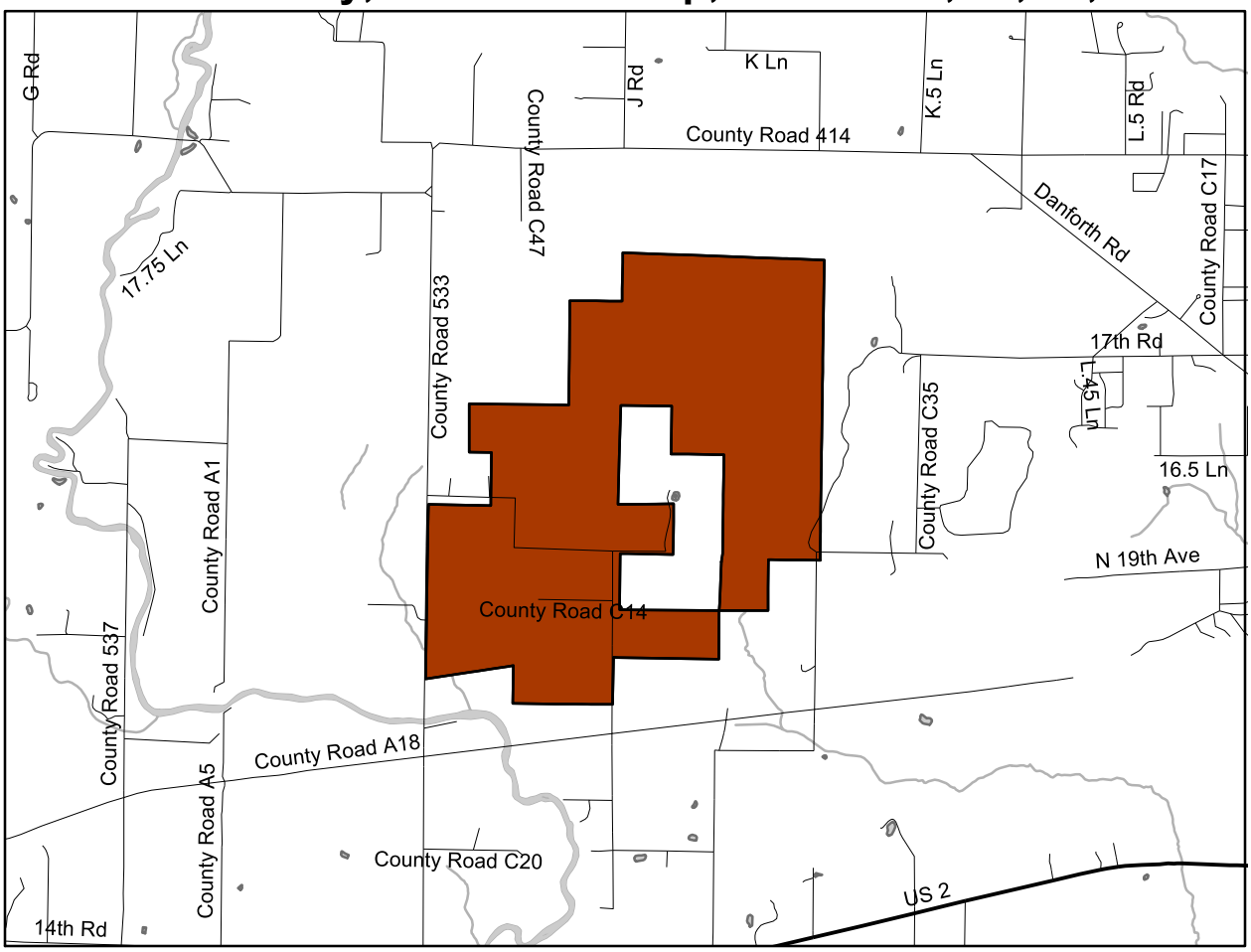


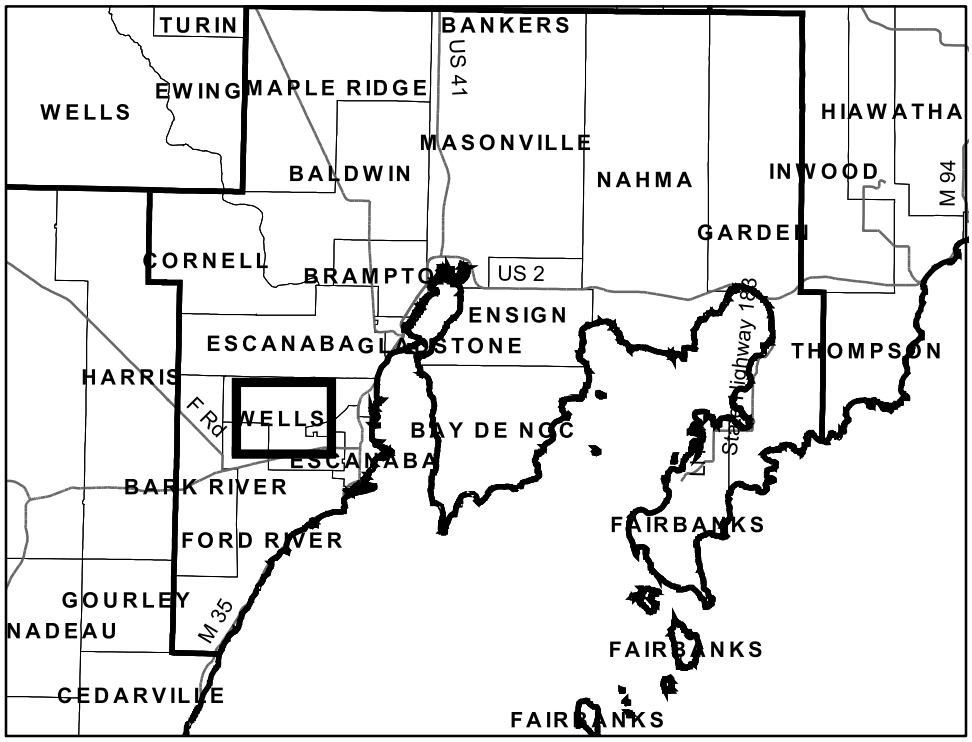
County Locator

Crawford County

Upper Peninsula Tree Improvement Center

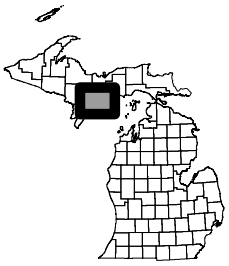
Delta County, Wells Township, Sections 8, 17, 18, 19 and 20



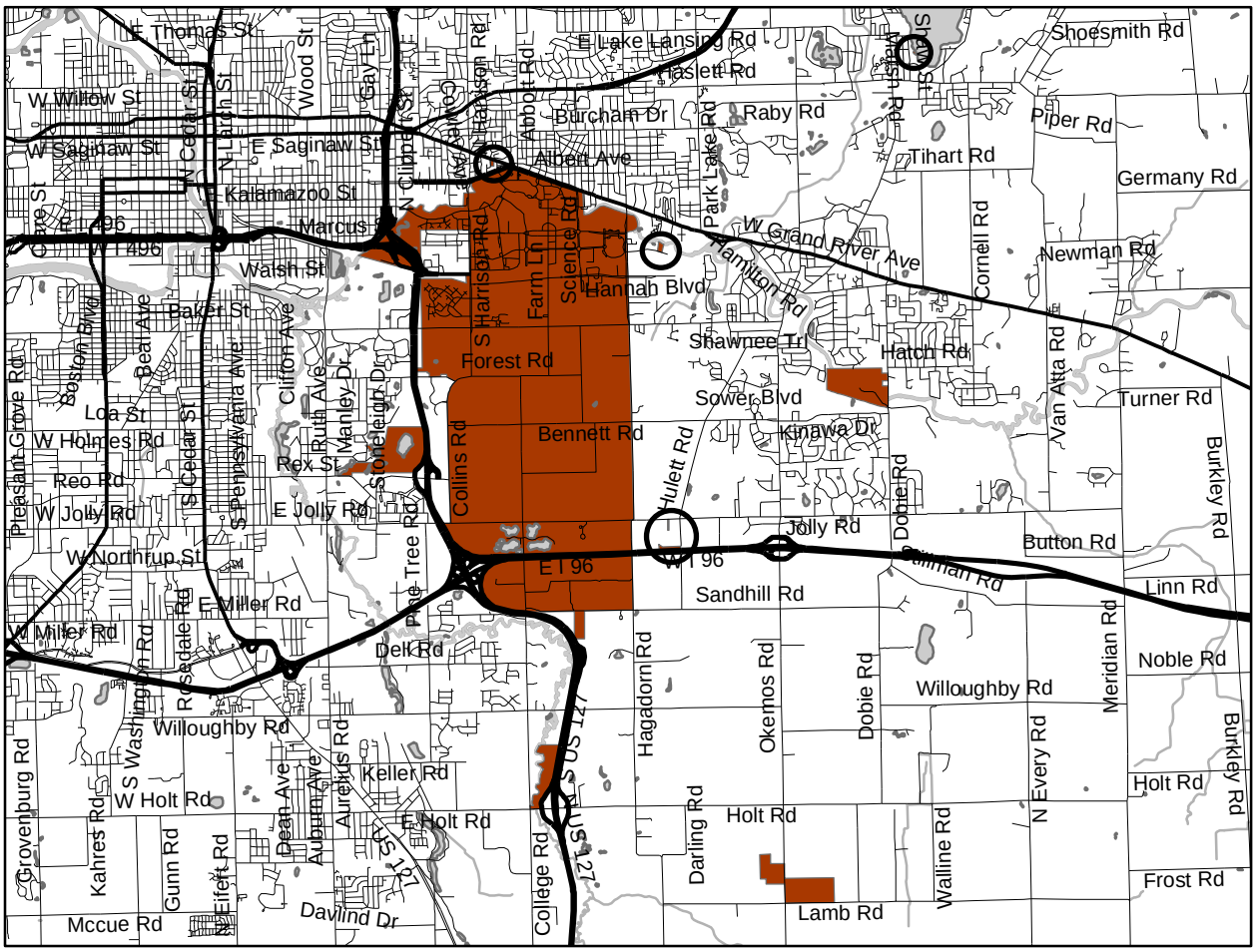


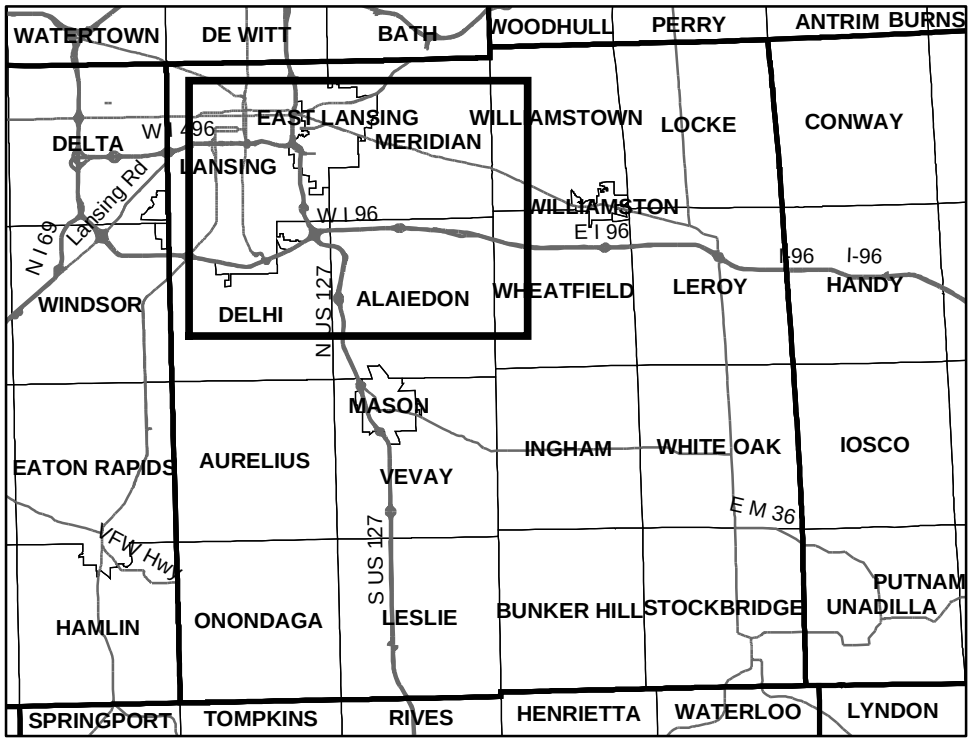
County Locator

Delta County

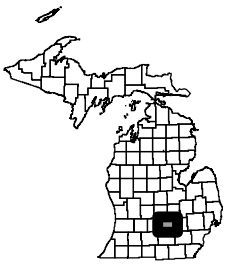


Ingham County Properties
Lansing, Meridian, Delhi and Alaeidon Townships



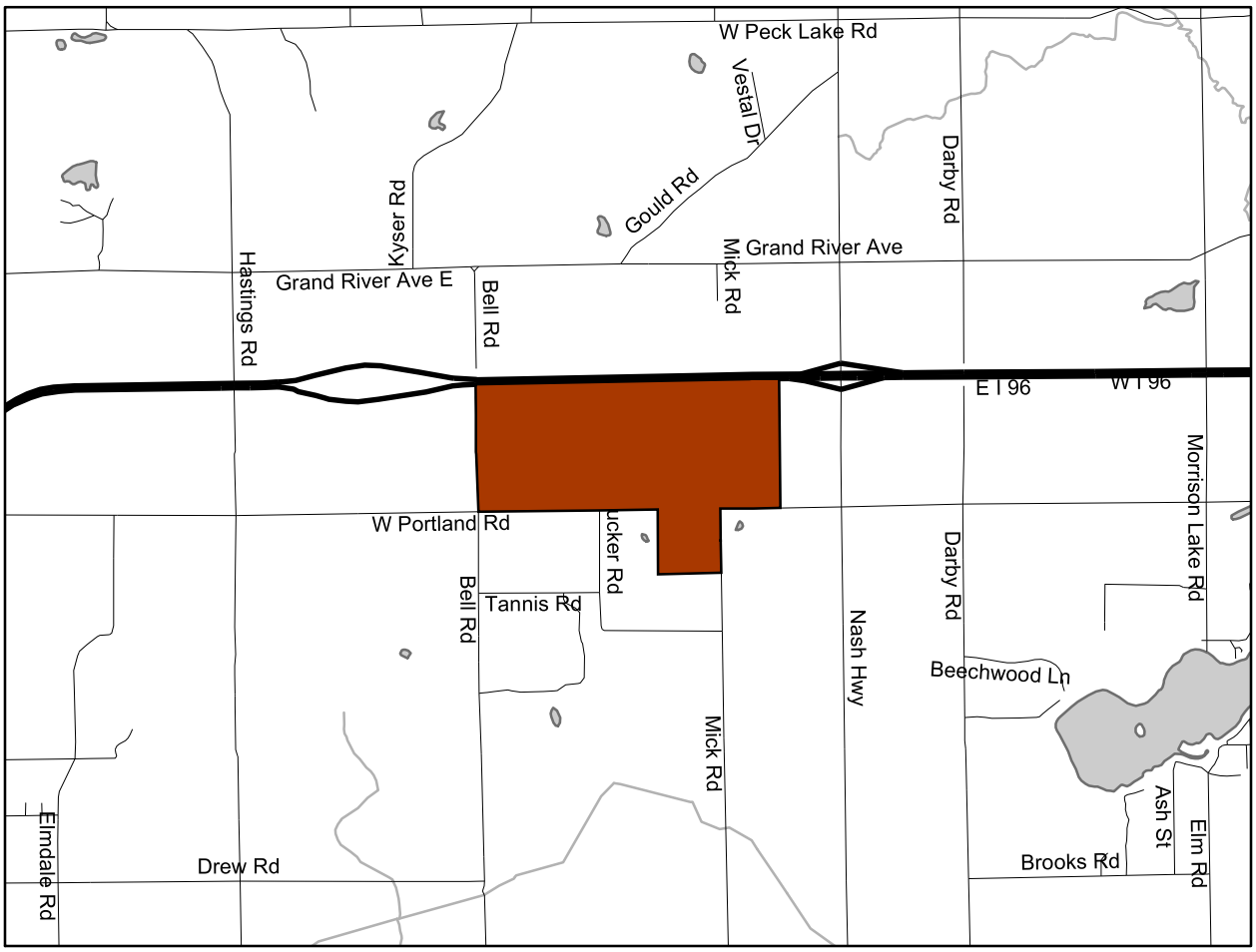


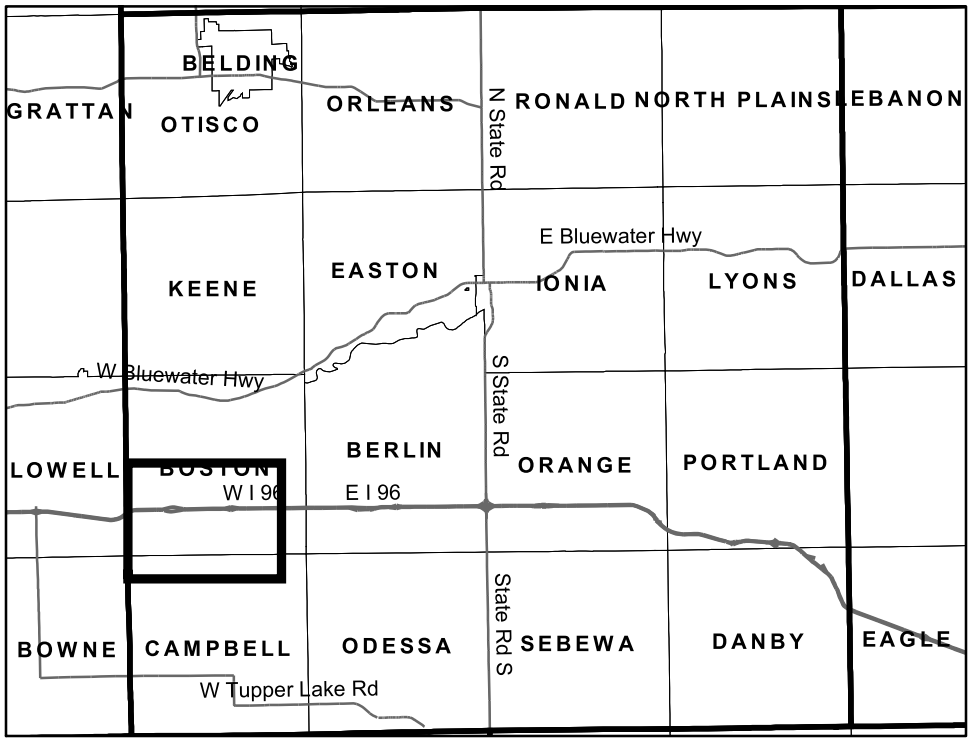
County Locator
Ingham County



Clarksville Horticultural Experiment Station

Ionia County, Boston Township, Sections 27, 28 and 33



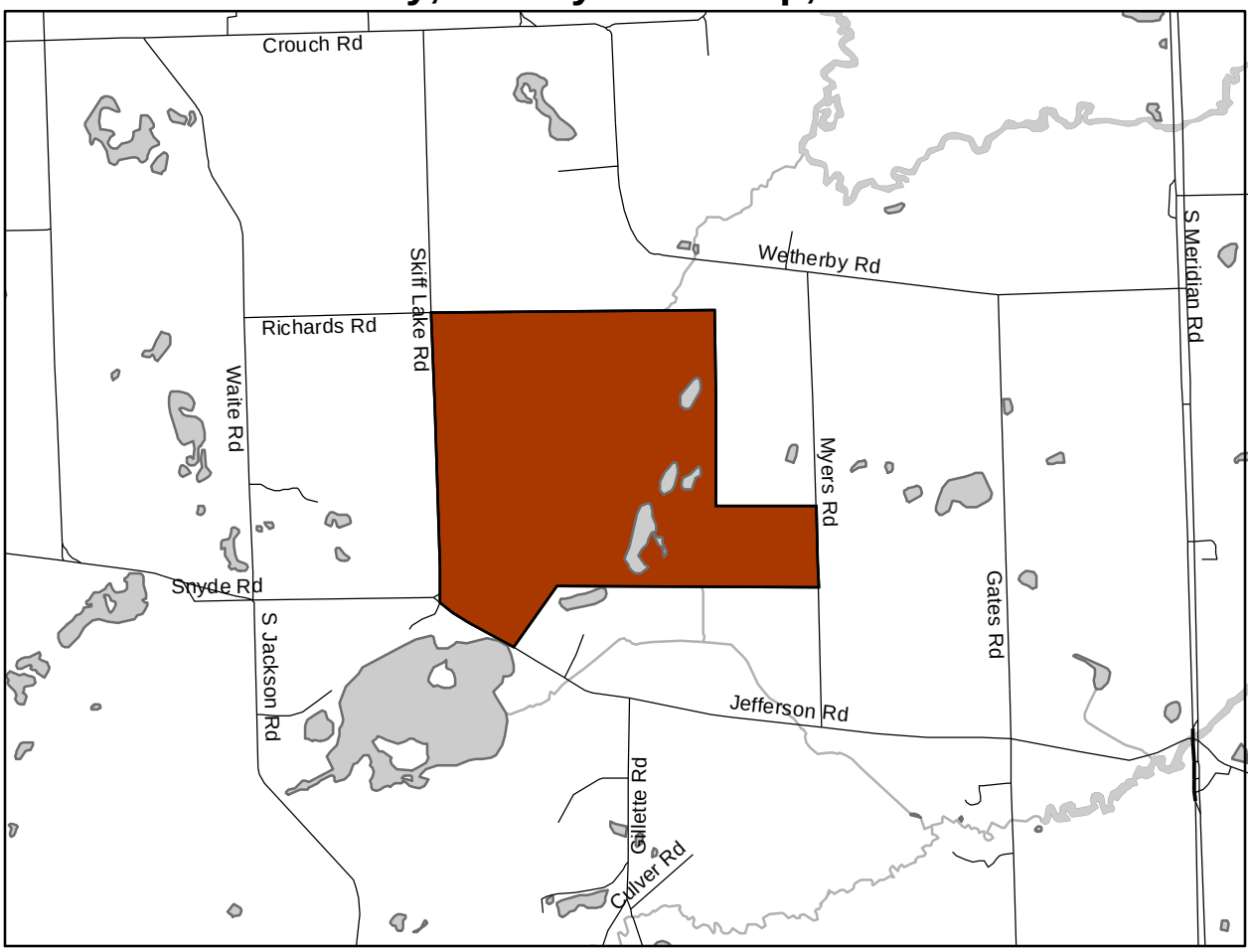


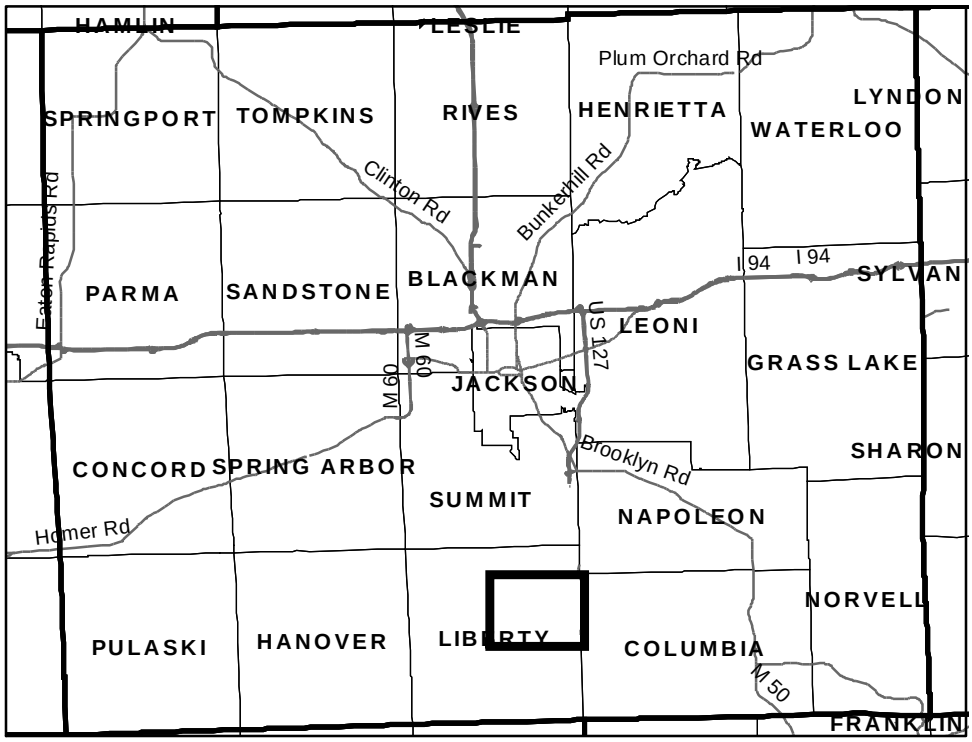
County Locator

Ionia County

MacCready Reserve

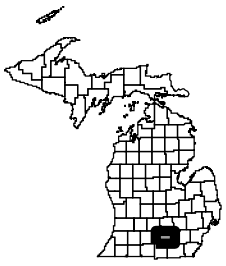
Jackson County, Liberty Township, Sections 11 and 14





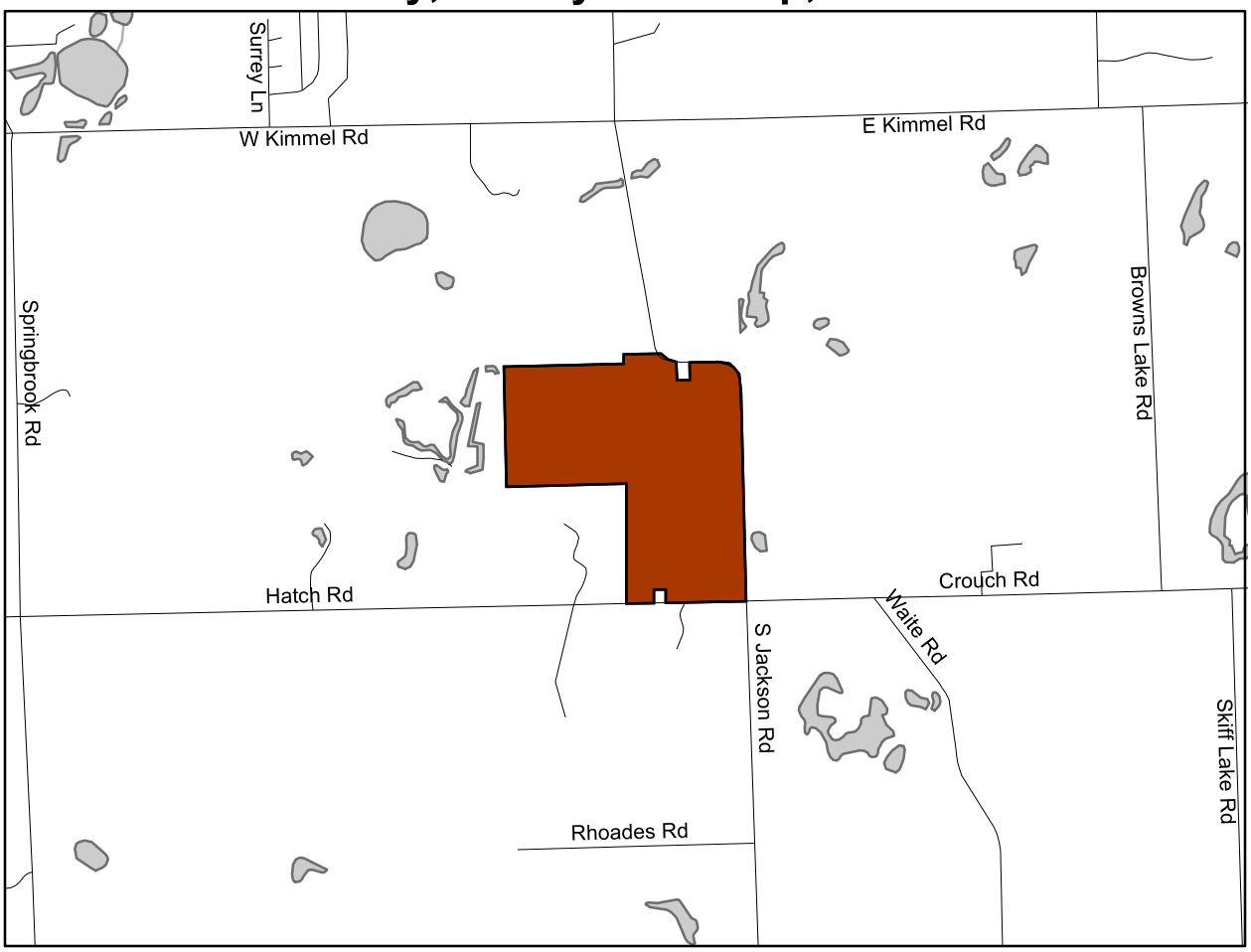
County Locator

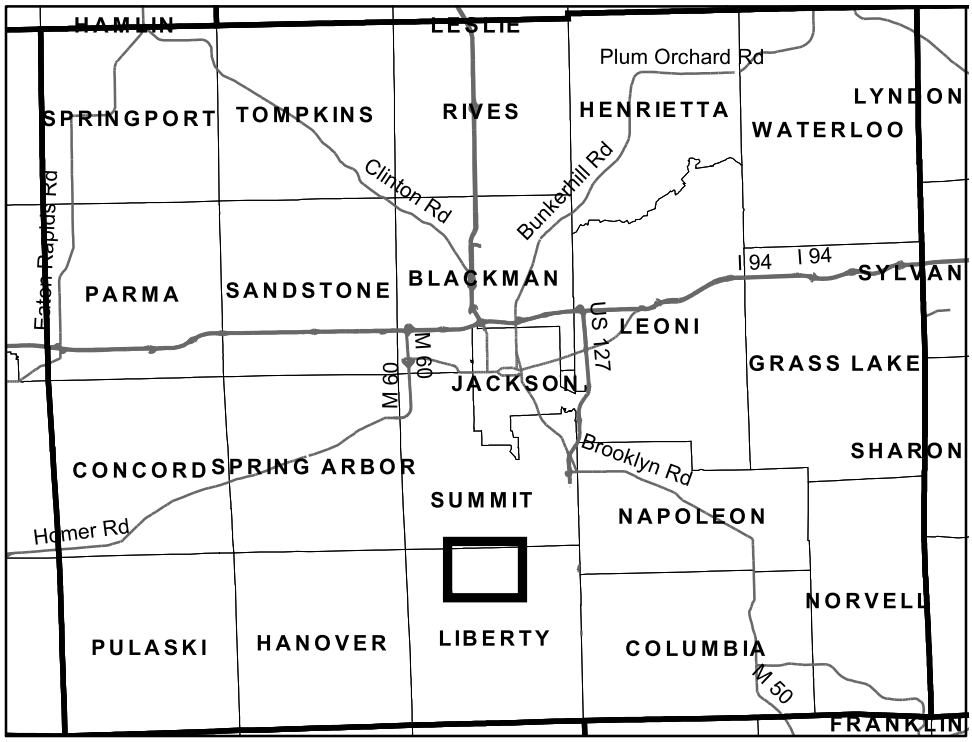
Jackson County



Rogers Reserve

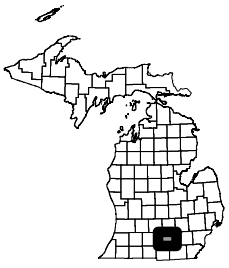
Jackson County, Liberty Township, Section 4





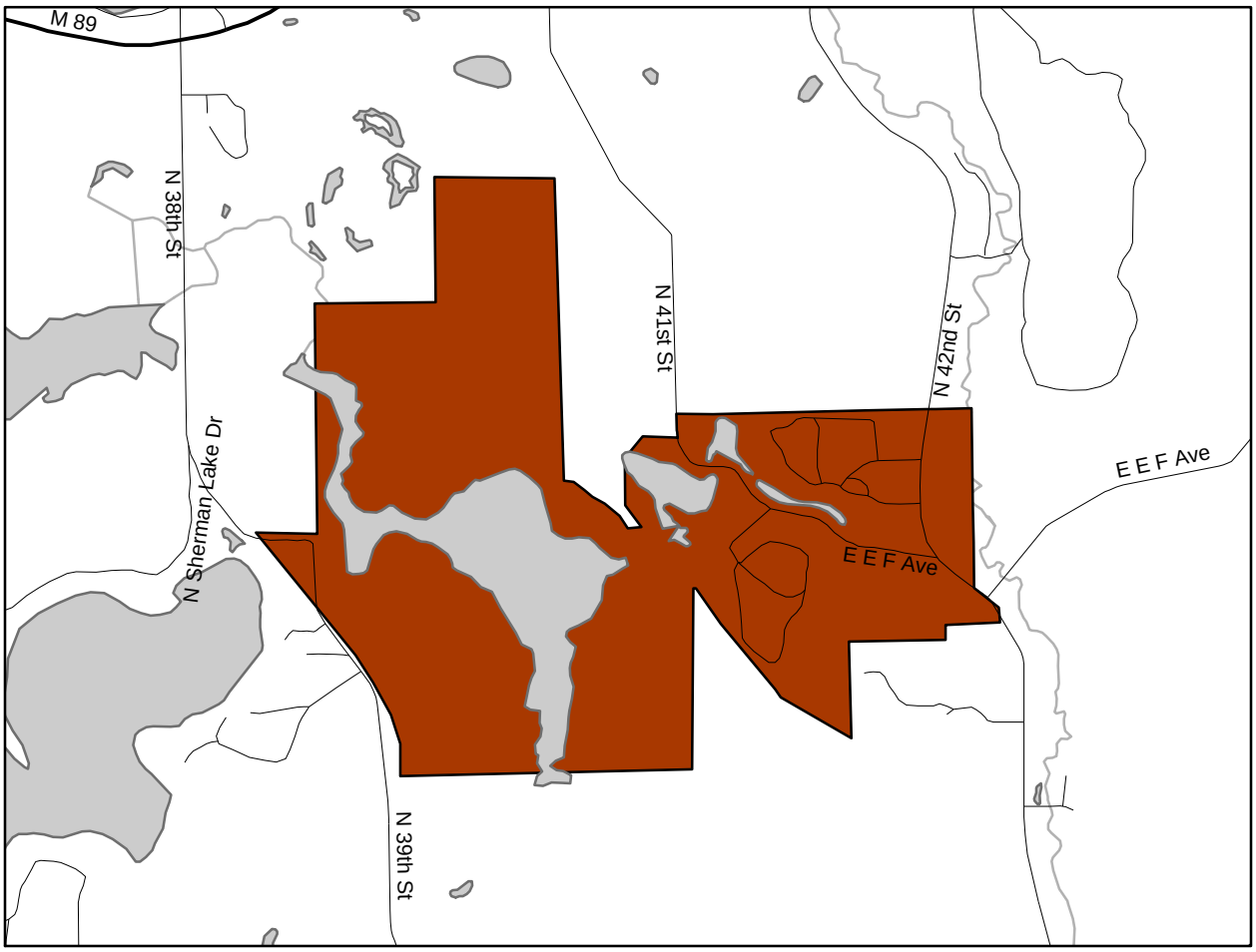
County Locator

Jackson County



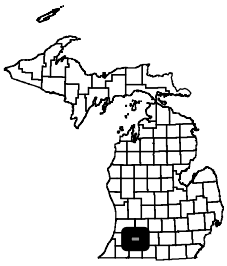
Brook Lodge

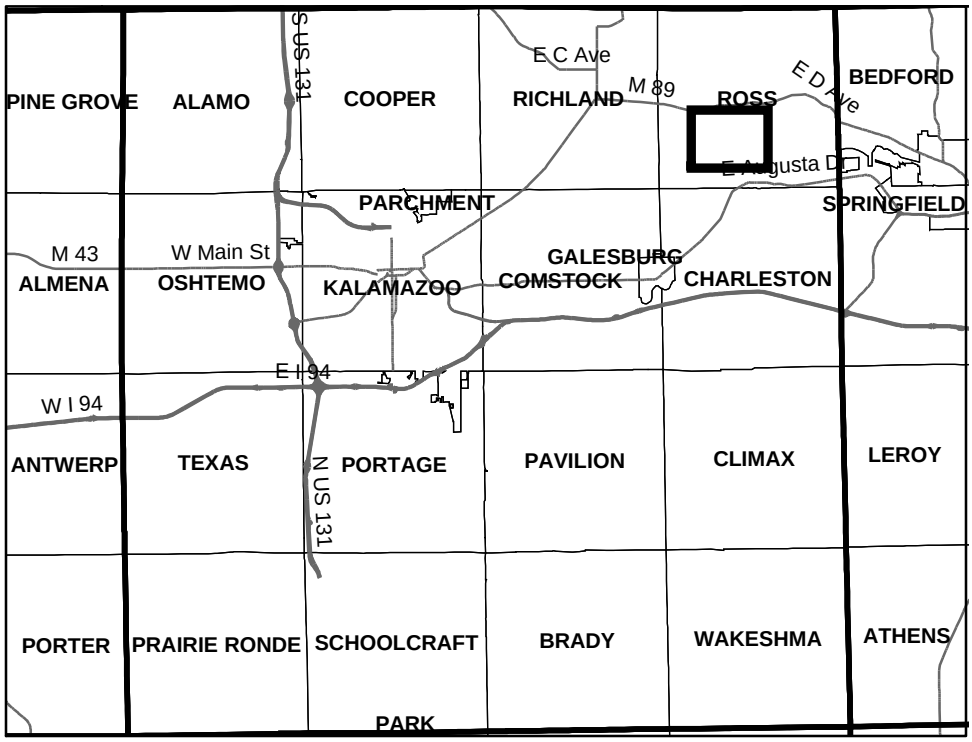
Kalamazoo County, Ross Township, Sections 21, 27, 28, and 29



County Locator

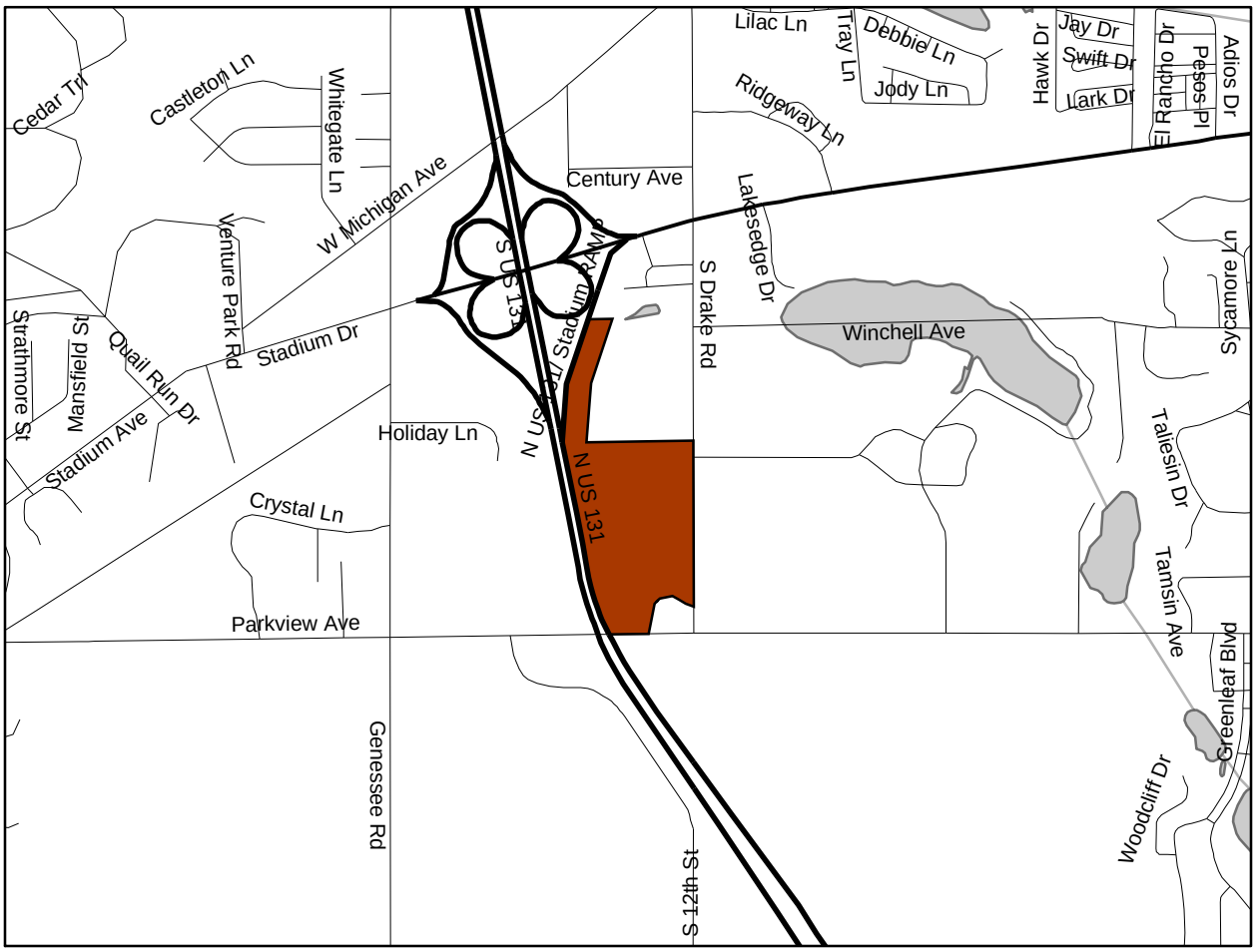
Kalamazoo County

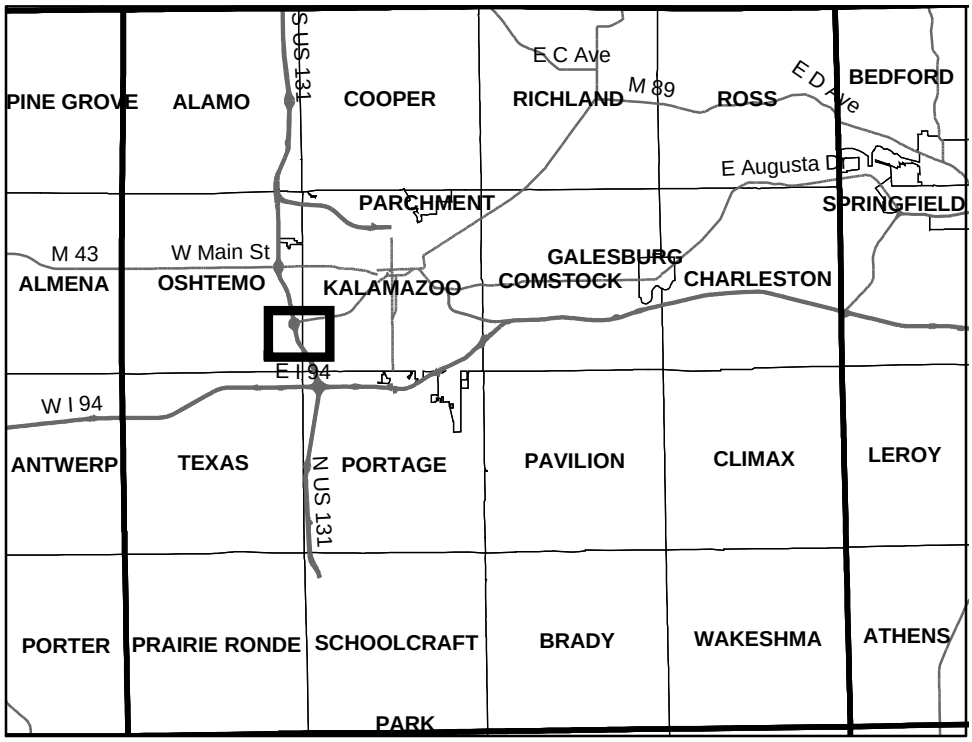




Kalamazoo Orchard (Leased)

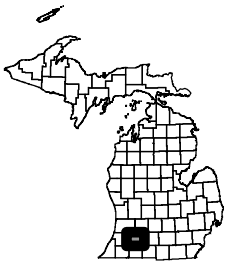
Kalamazoo County, Oshtemo Township, Section 25





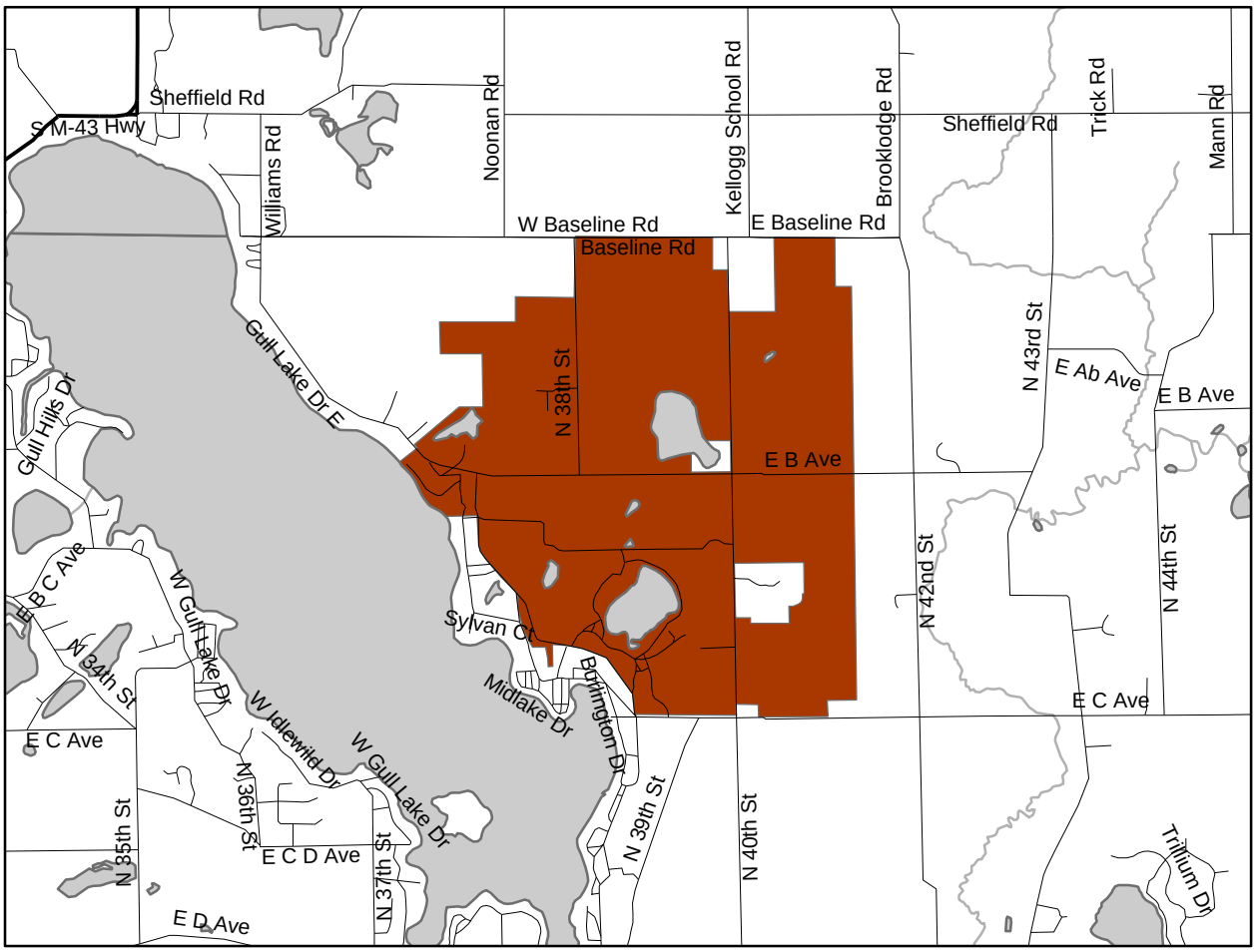
County Locator

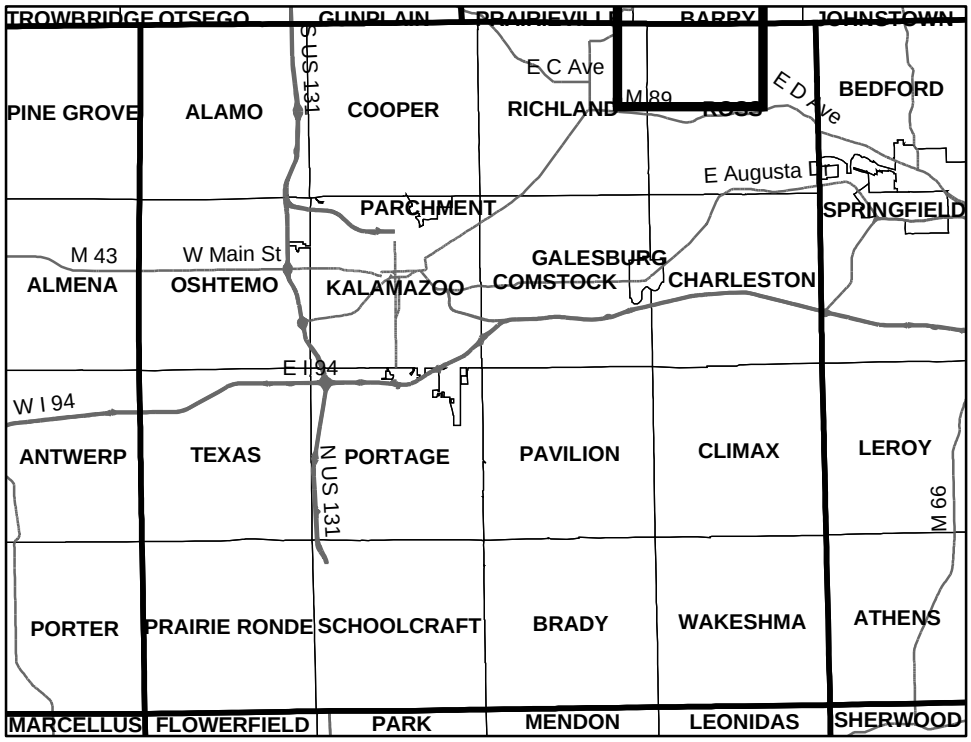
Kalamazoo County



W.K. Kellogg Biological Station, Bird Sanctuary and Farm

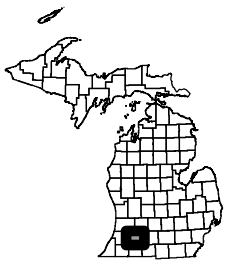
Kalamazoo County, City of South Gull Lake and Ross Township, Sections 4, 5, 6, 8 and 9



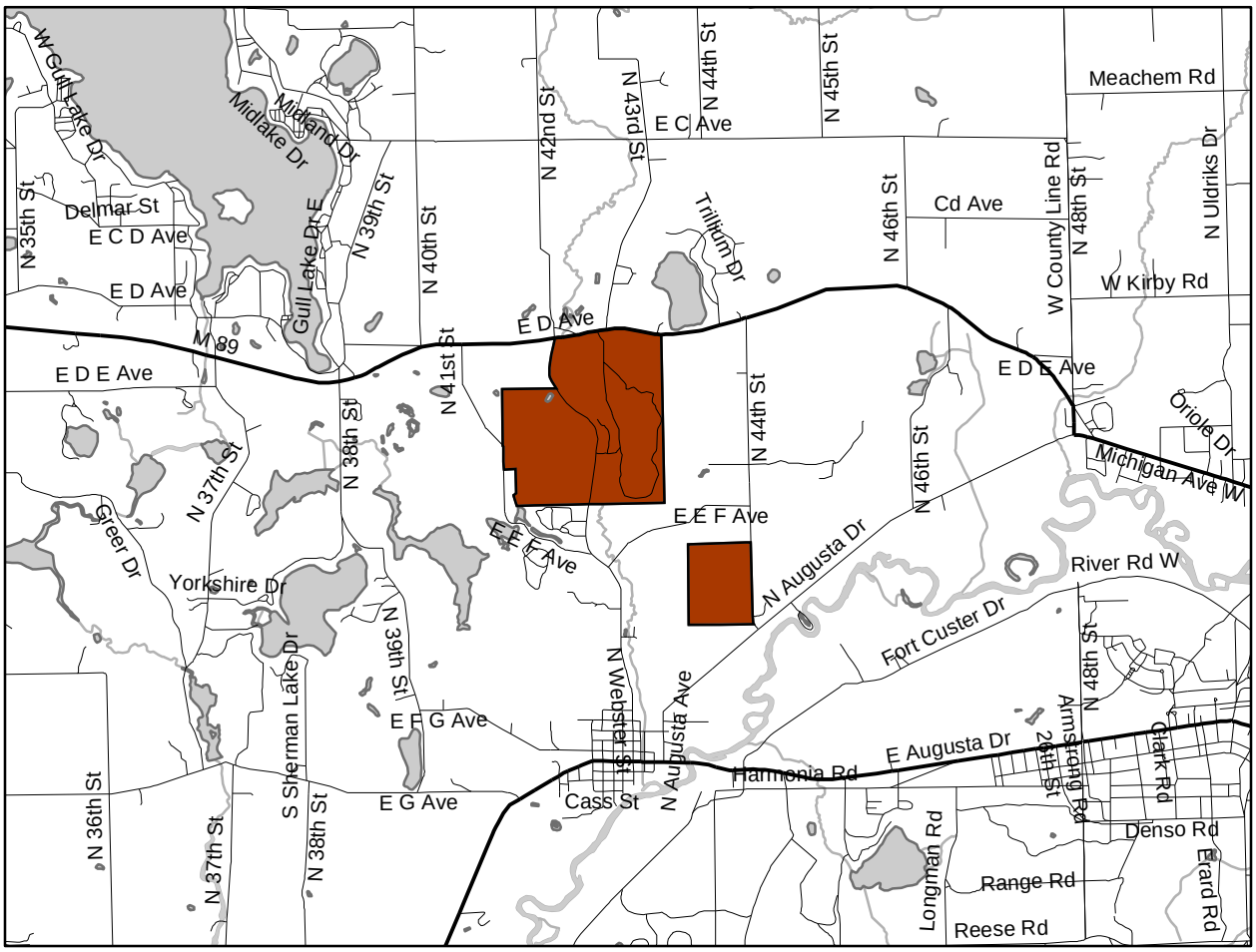


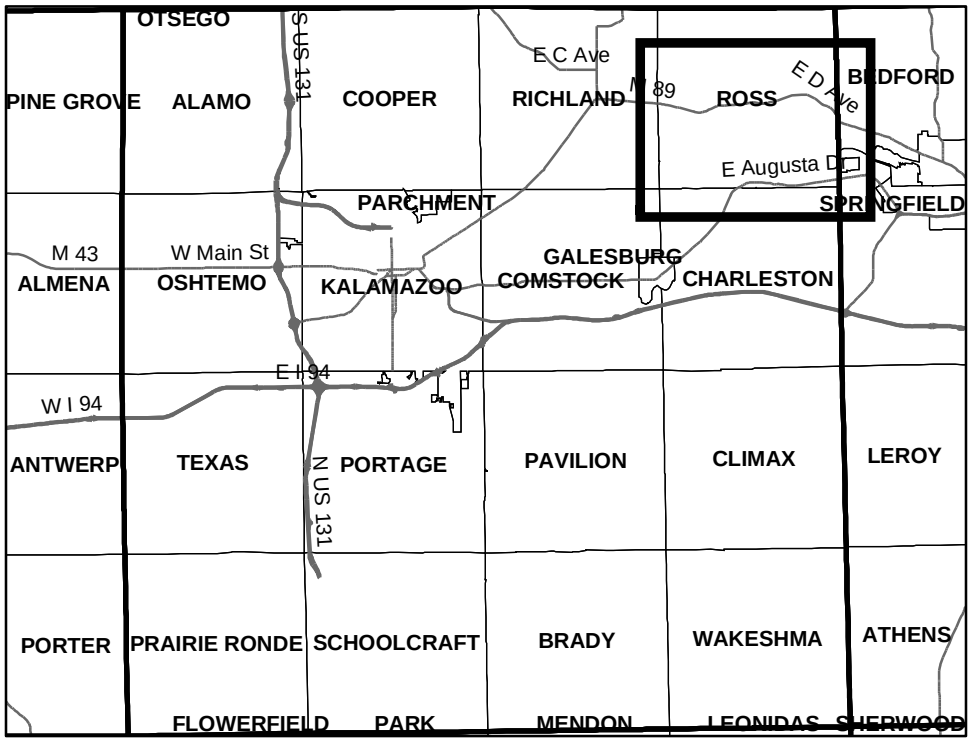
County Locator

Kalamazoo County



W.K. Kellogg Experimental Forest
Ross Township, Kalamazoo County, Sections 21, 22, 27 and 28



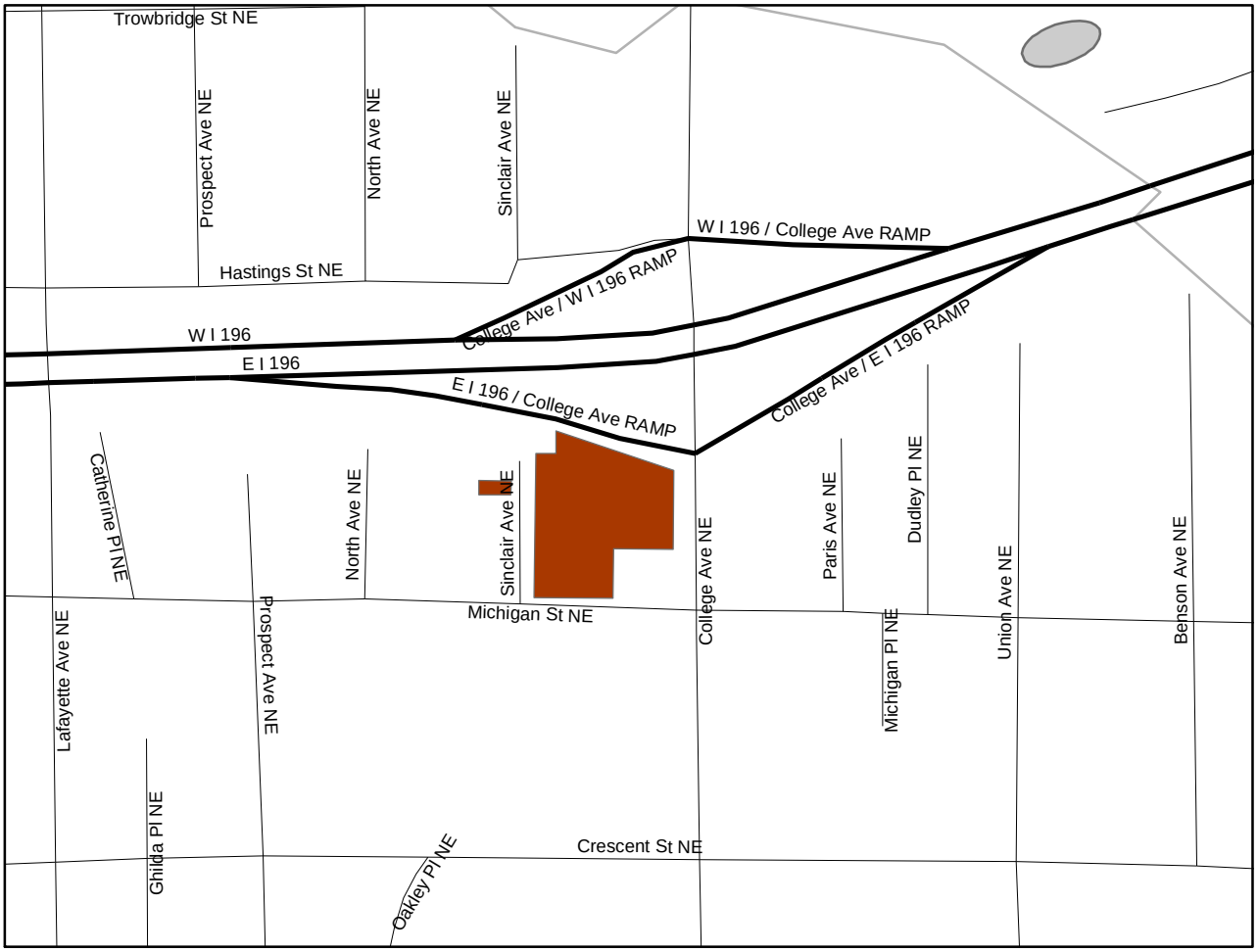


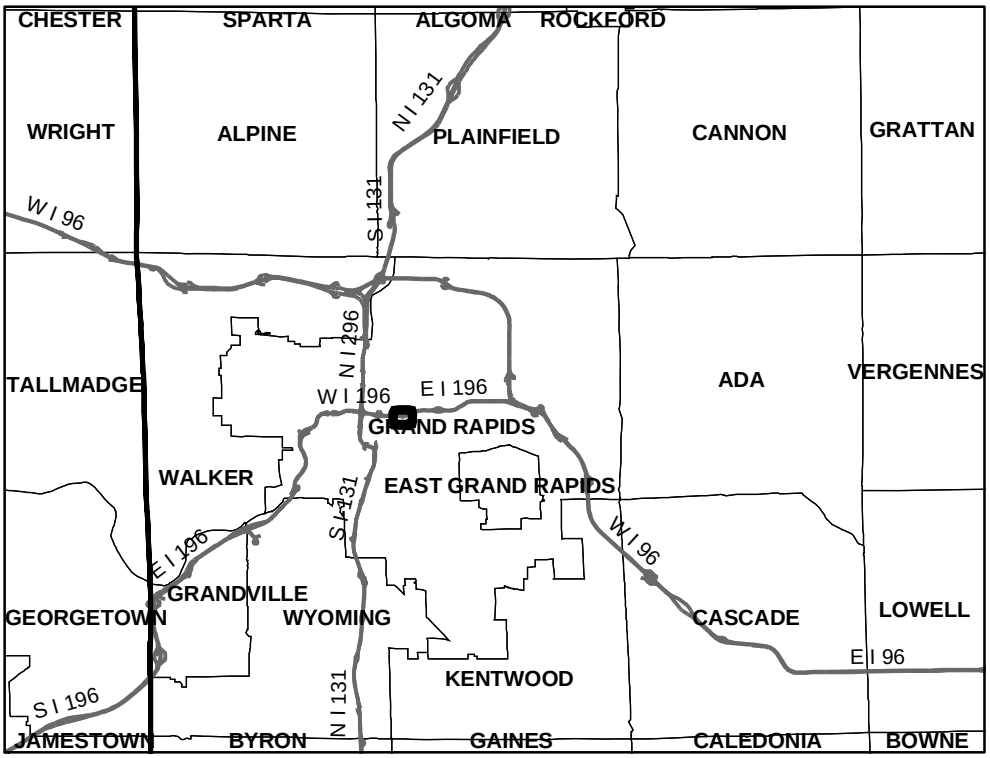
County Locator

Kalamazoo

College of Human Medicine

Kent County, Grand Rapids Township, Section 19



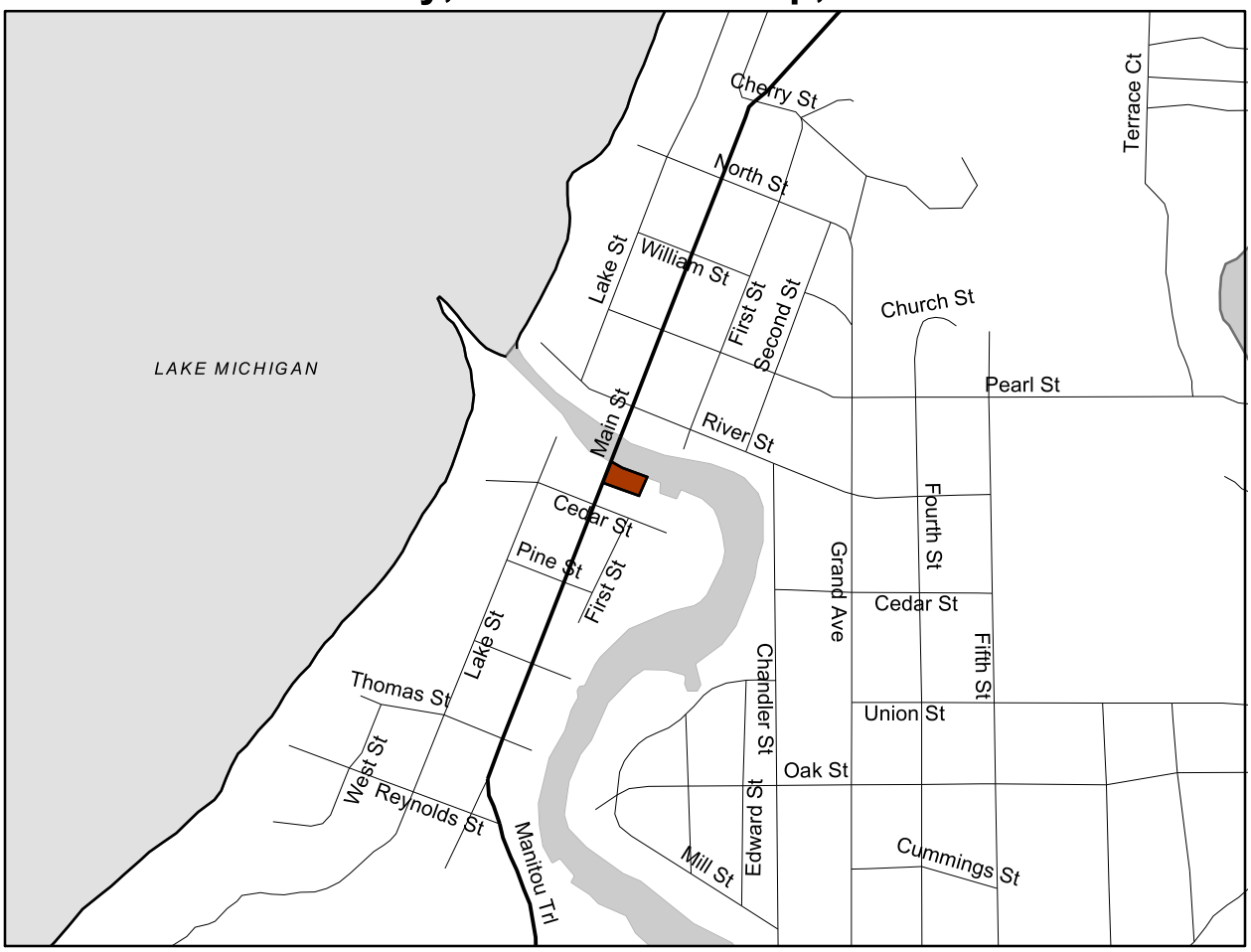


County Locator

Kent County

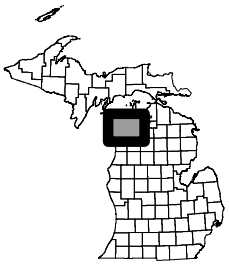
Leland Property

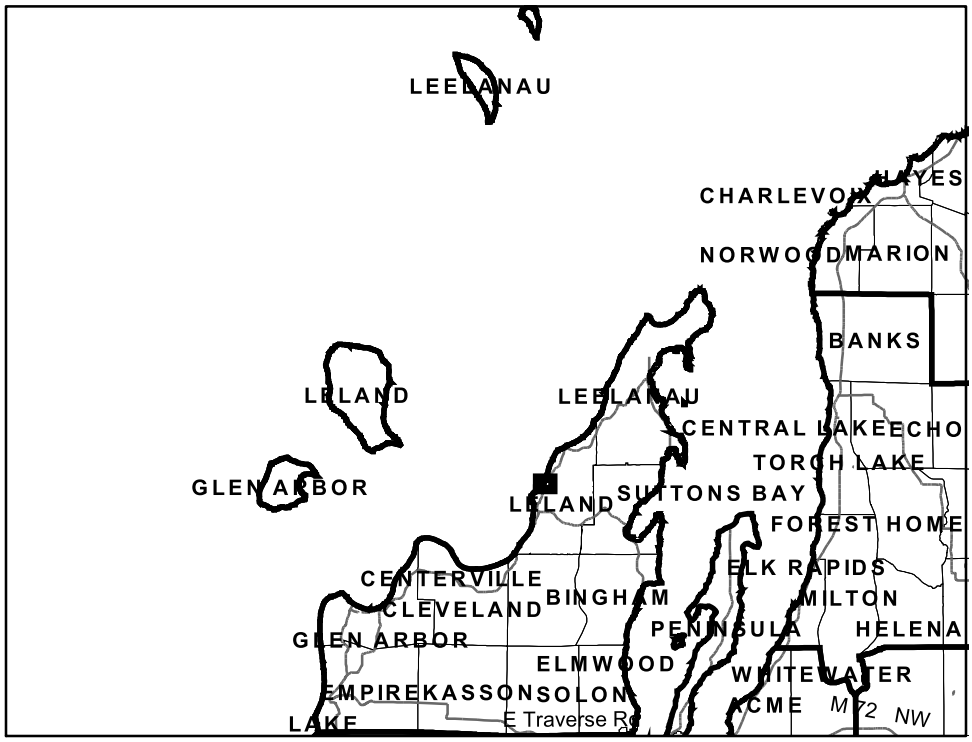
Leelanau County, Leland Township, Section 9



County Locator

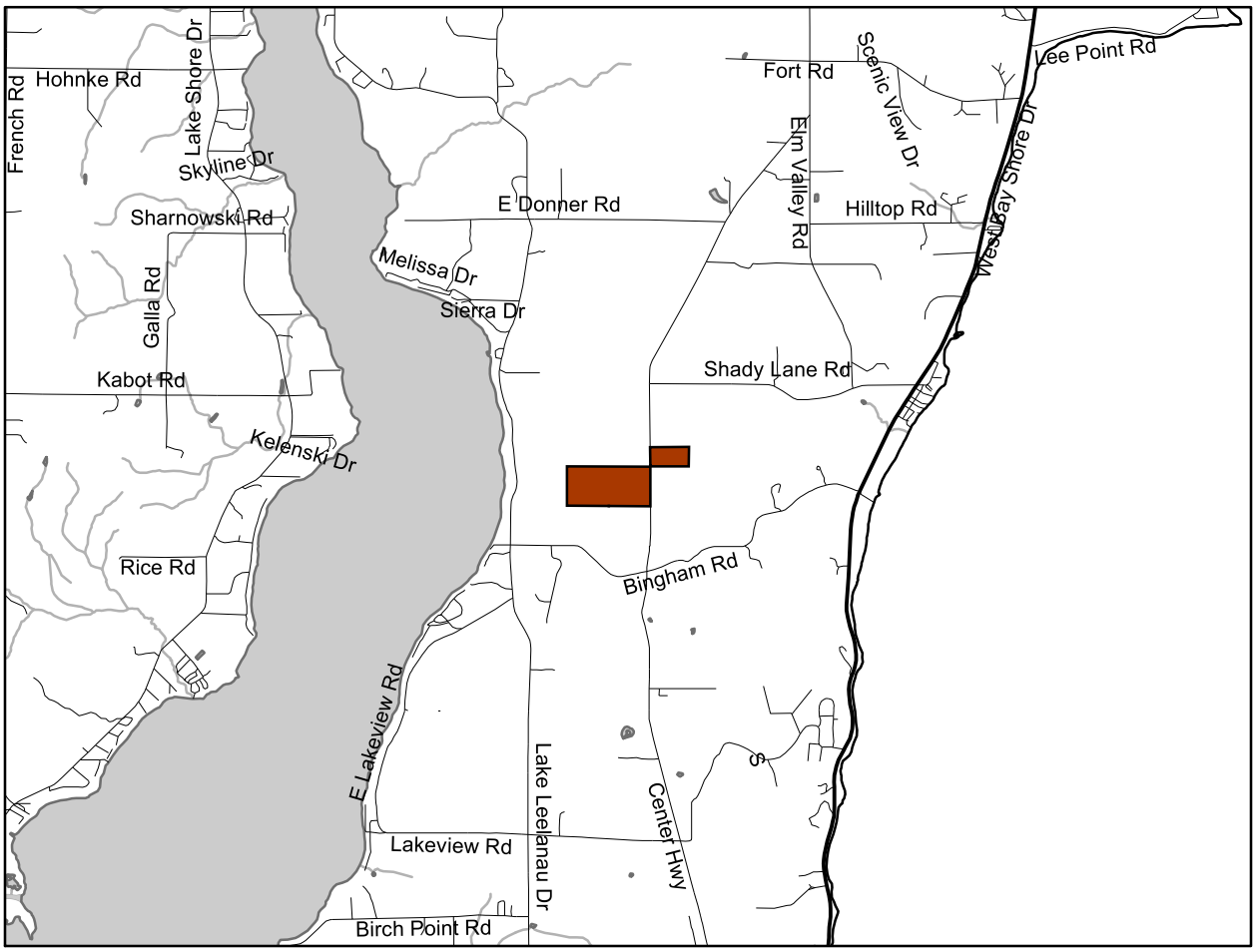
Leelanau County

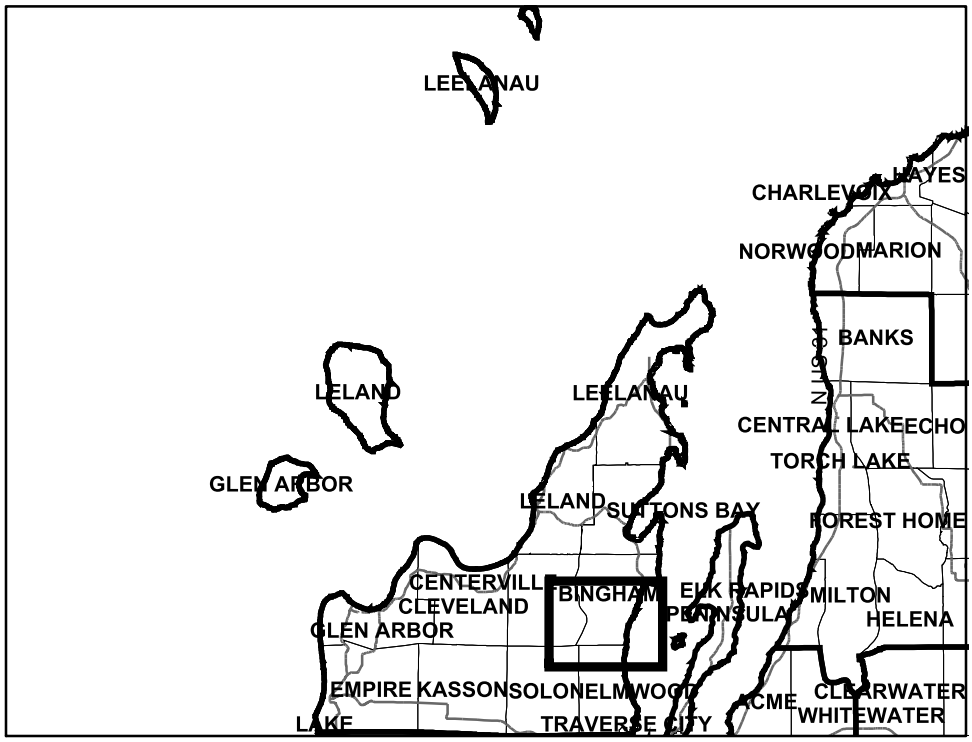




Northwest Michigan Horticultural Research Station (Leased)

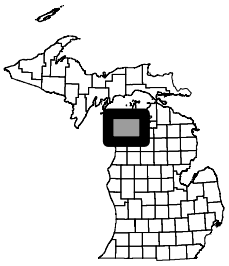
Leelanau County, Bingham Township, Sections 29 and 30





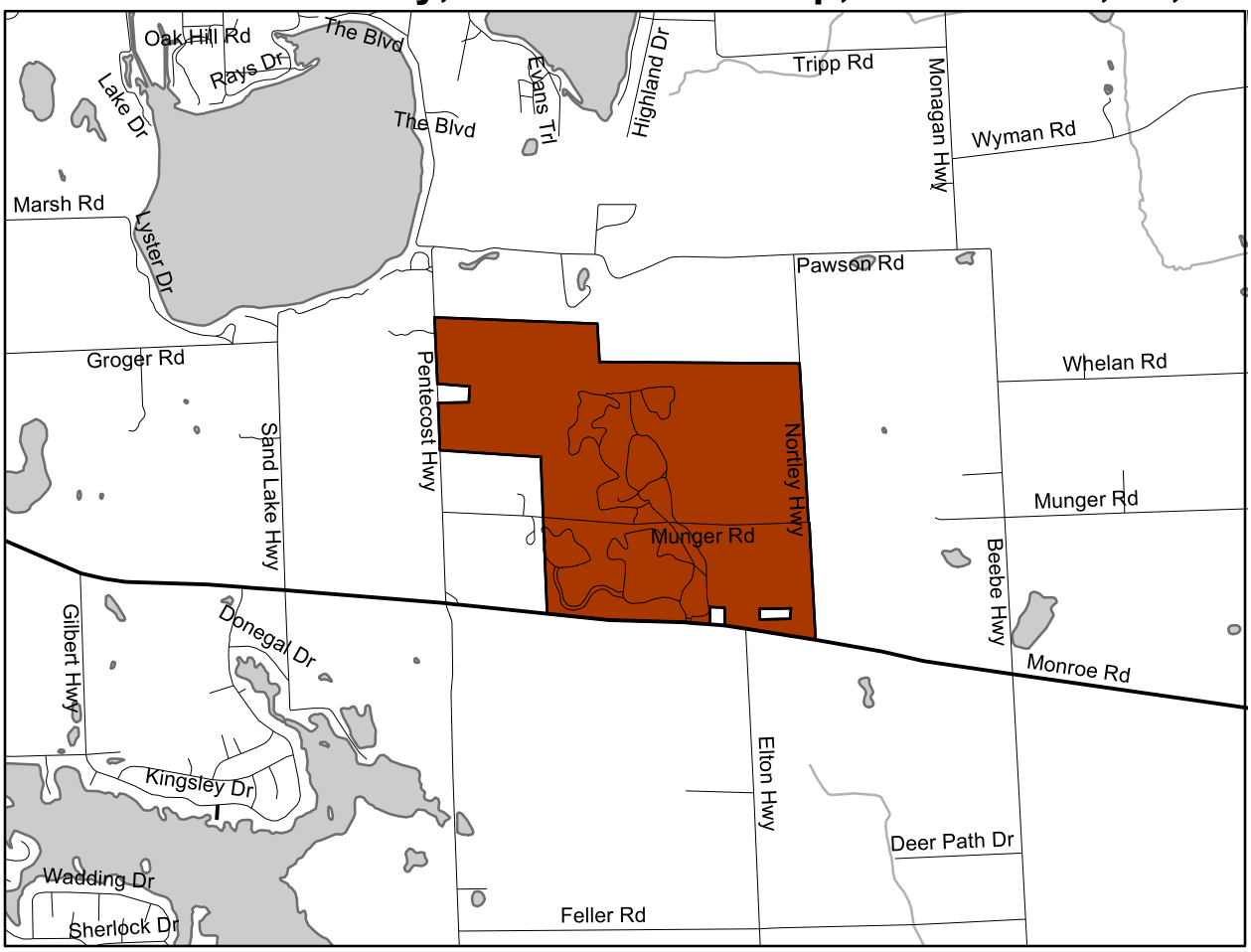
County Locator

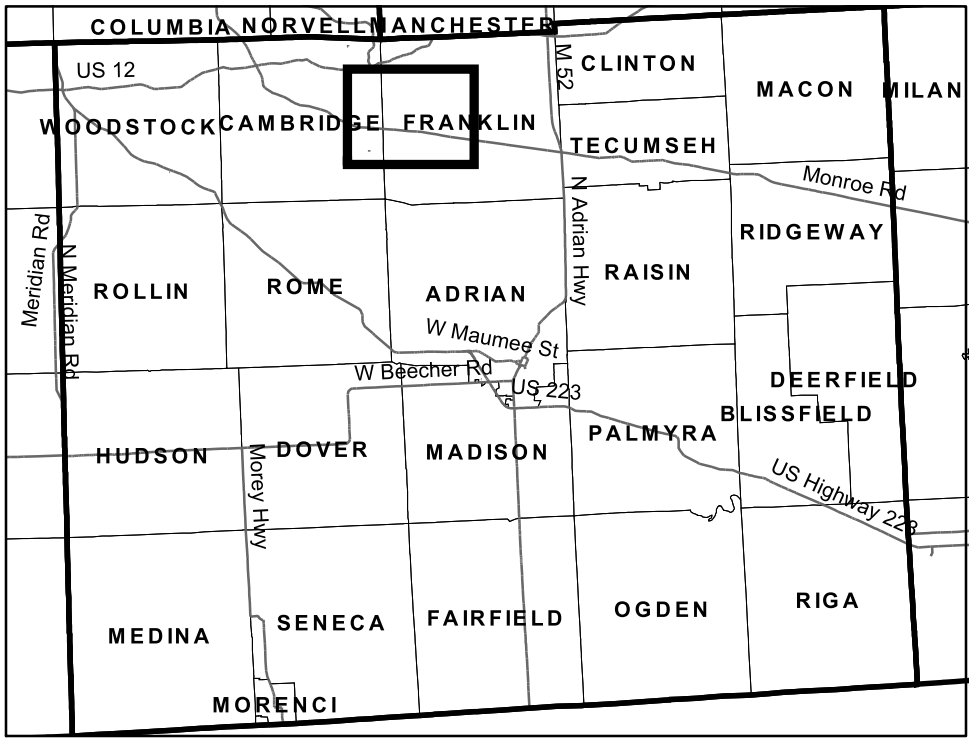
Leelanau County



Hidden Lake Gardens

Lenawee County, Franklin Township, Sections 17, 18, 19 and 20



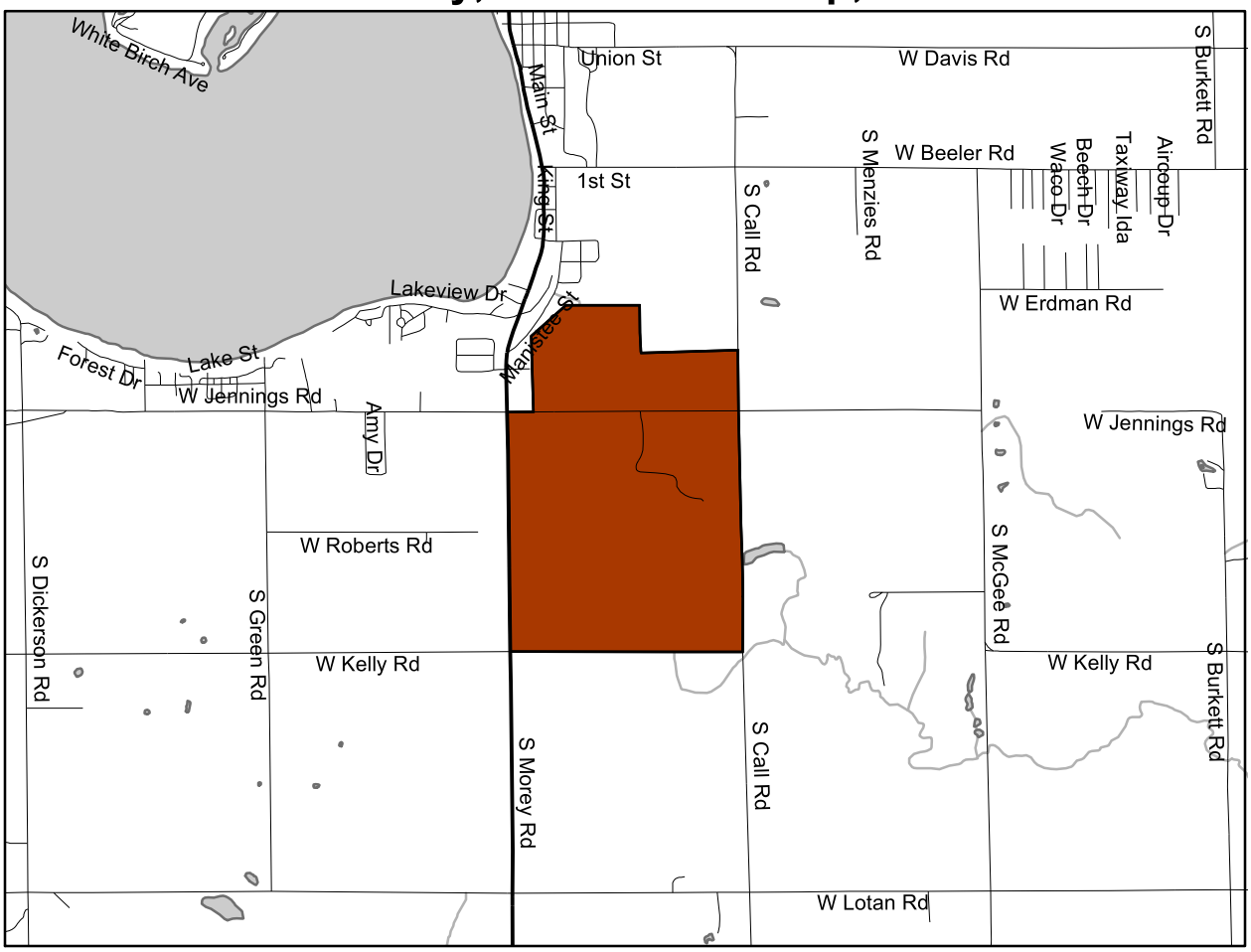


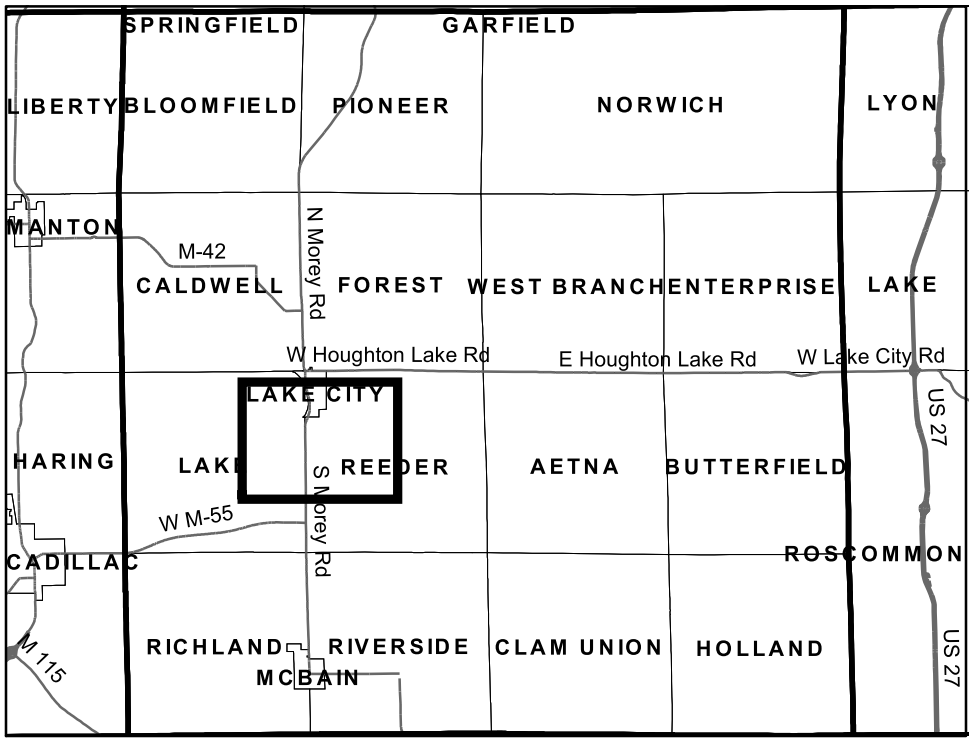
County Locator

Lenawee County

Lake City Experiment Station

Missaukee County, Reeder Township, Sections 7 and 18



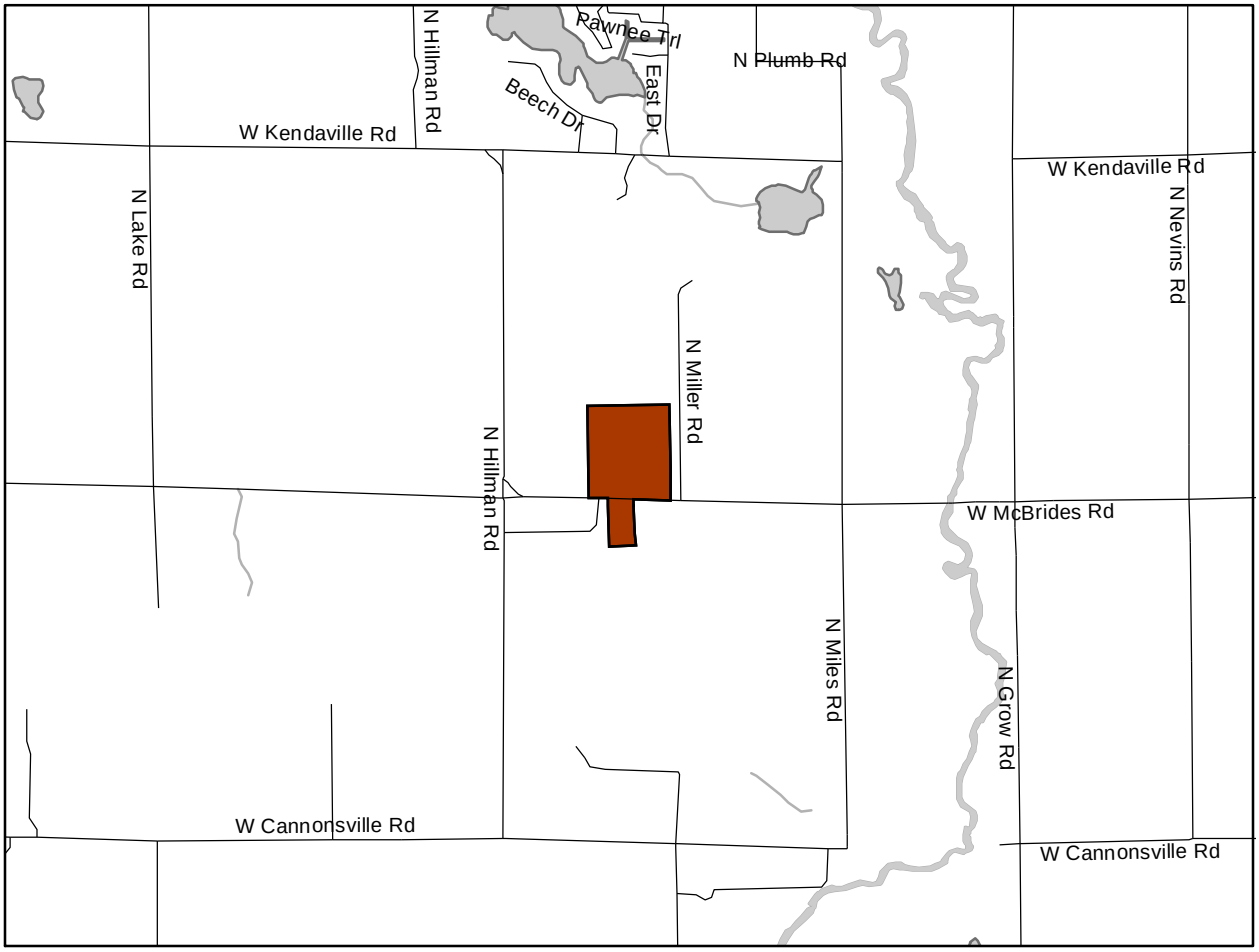


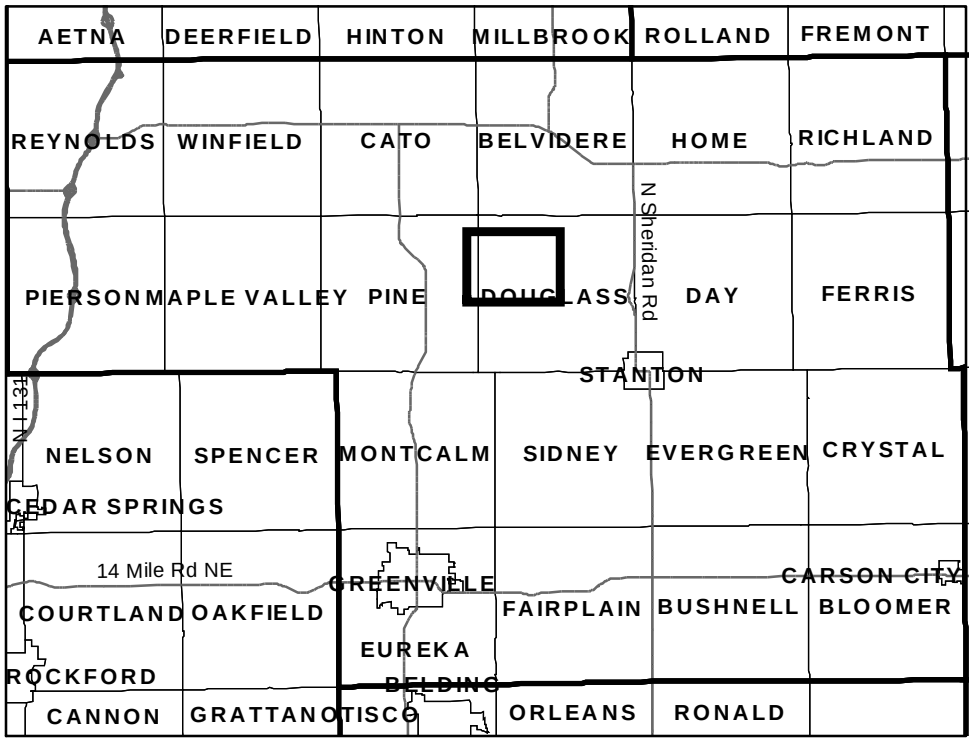
County Locator

Missaukee County

Montcalm Research Farm

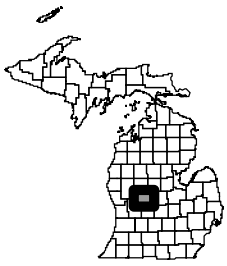
Montcalm County, Douglass Township, Sections 8 and 17



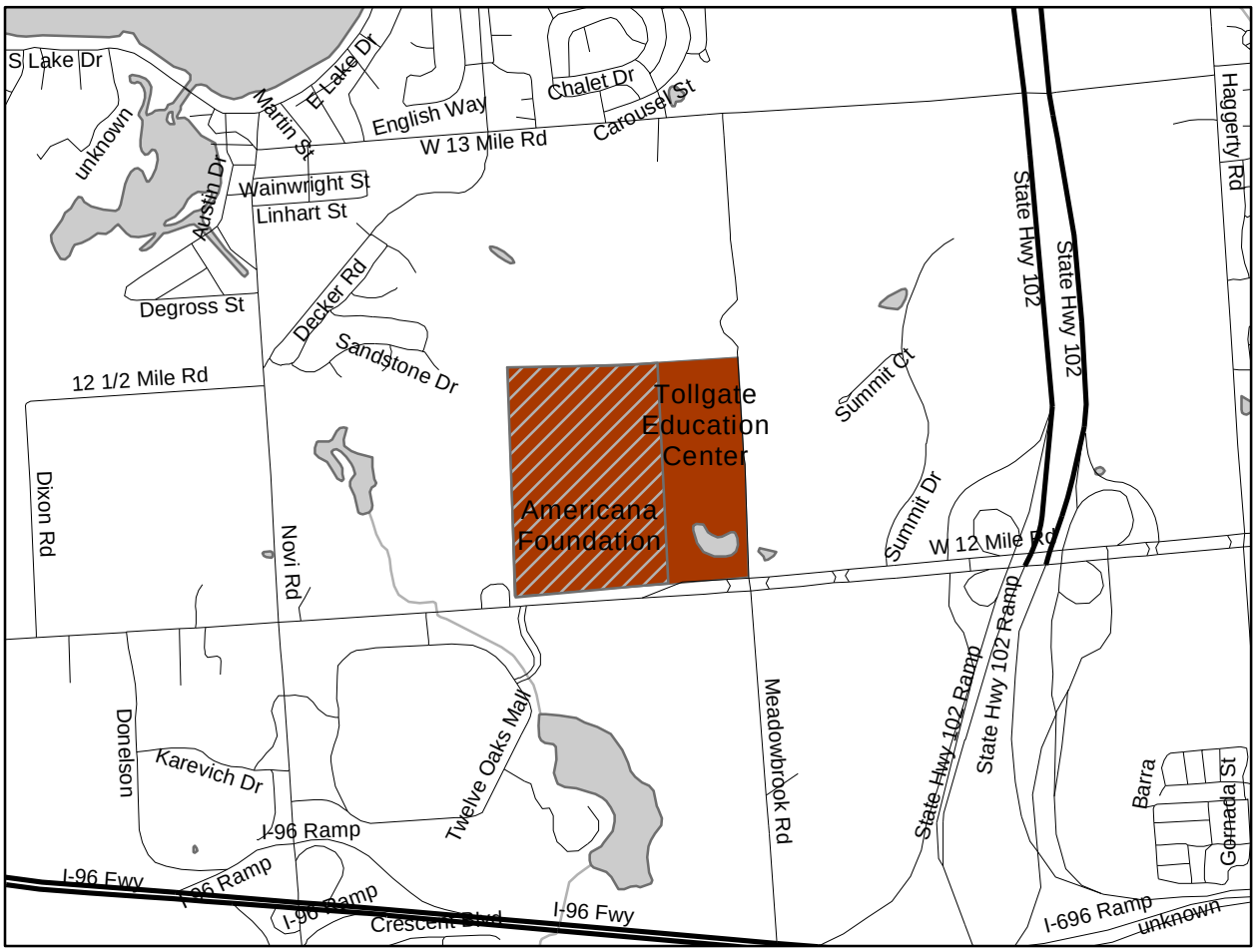


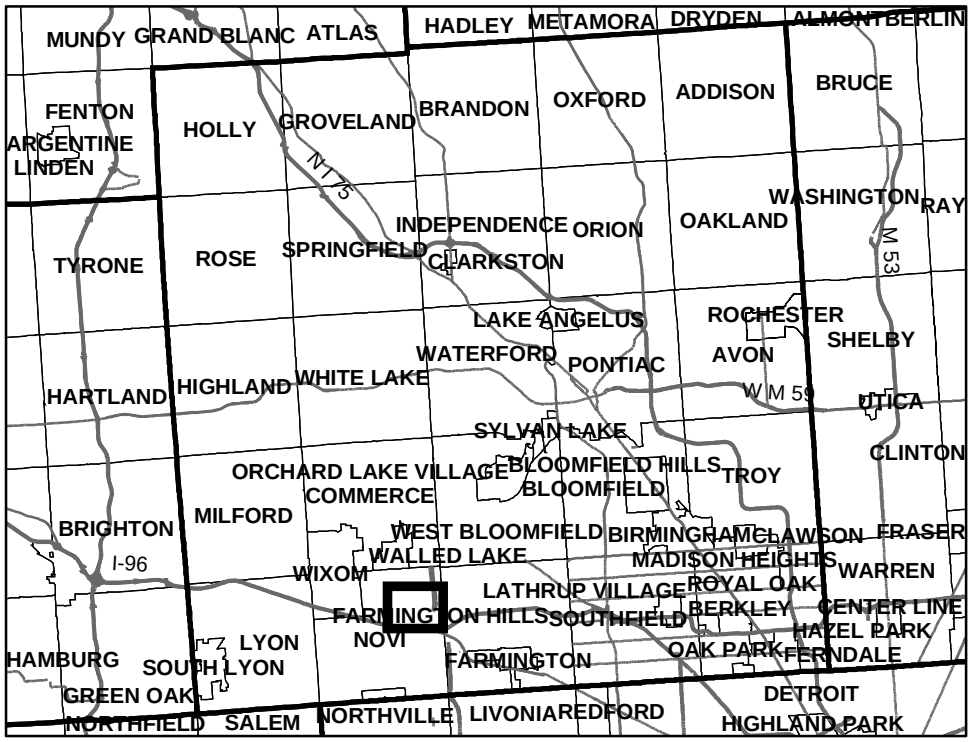
County Locator

Montcalm County

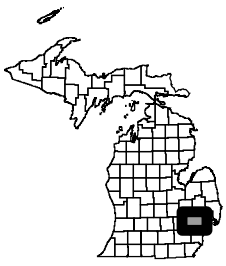


Tollgate Education Center and Americana Foundation Property
Oakland County, City of Novi, Section 11

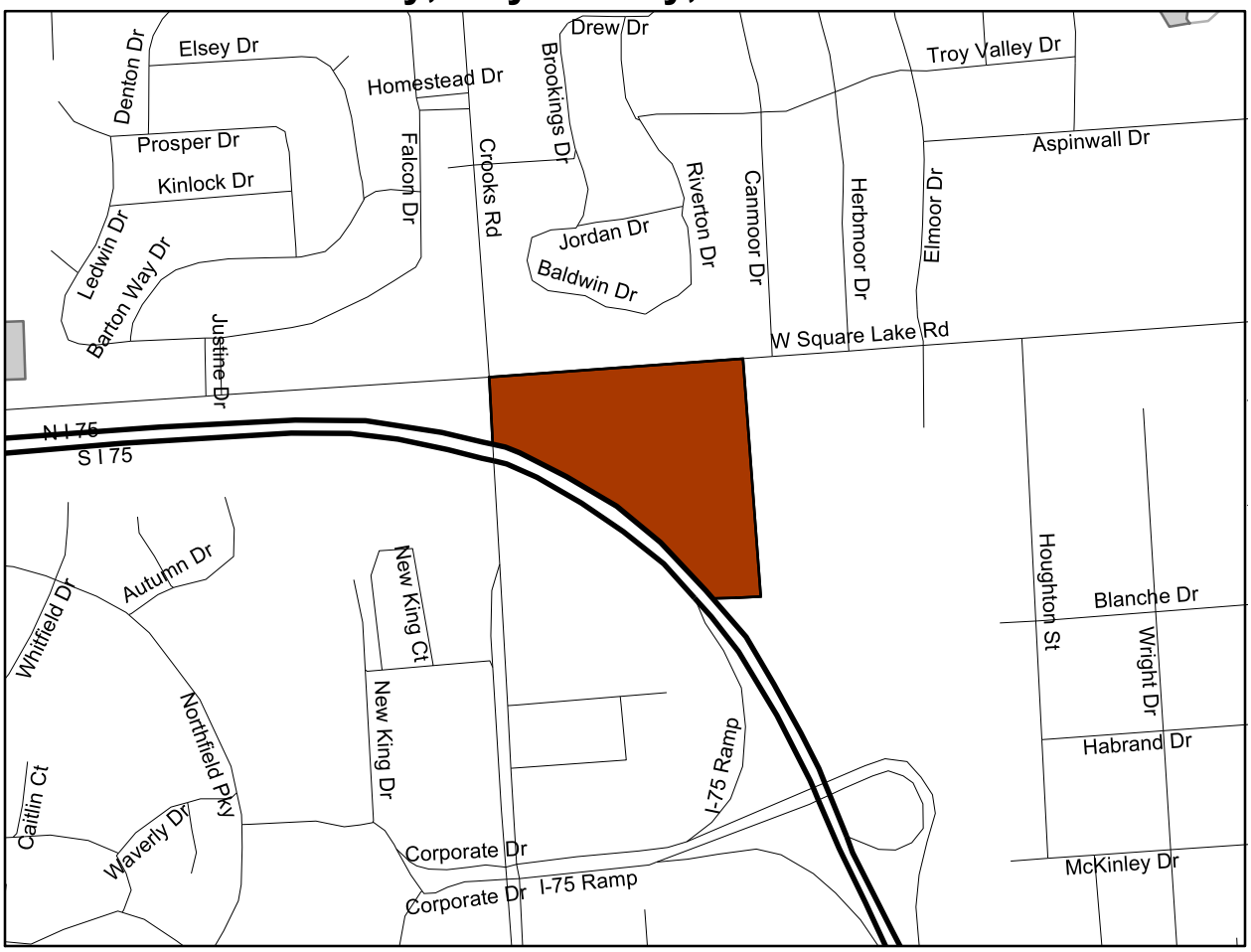


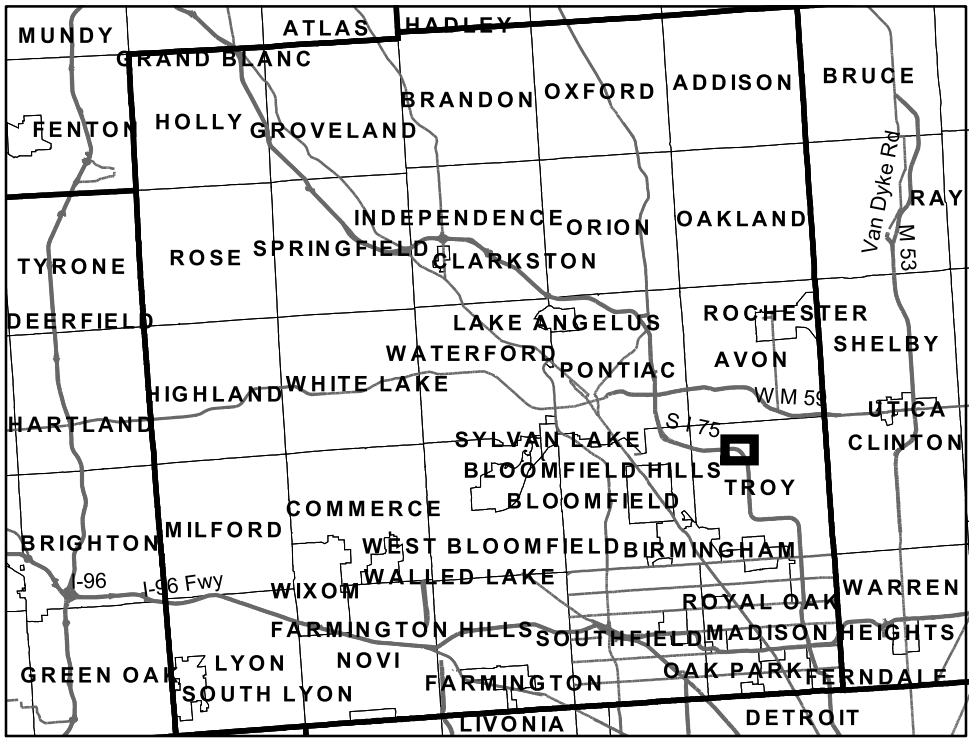


County Locator
Oakland County

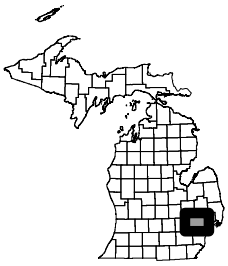


Troy Management Education Center
Oakland County, City of Troy, Section 9



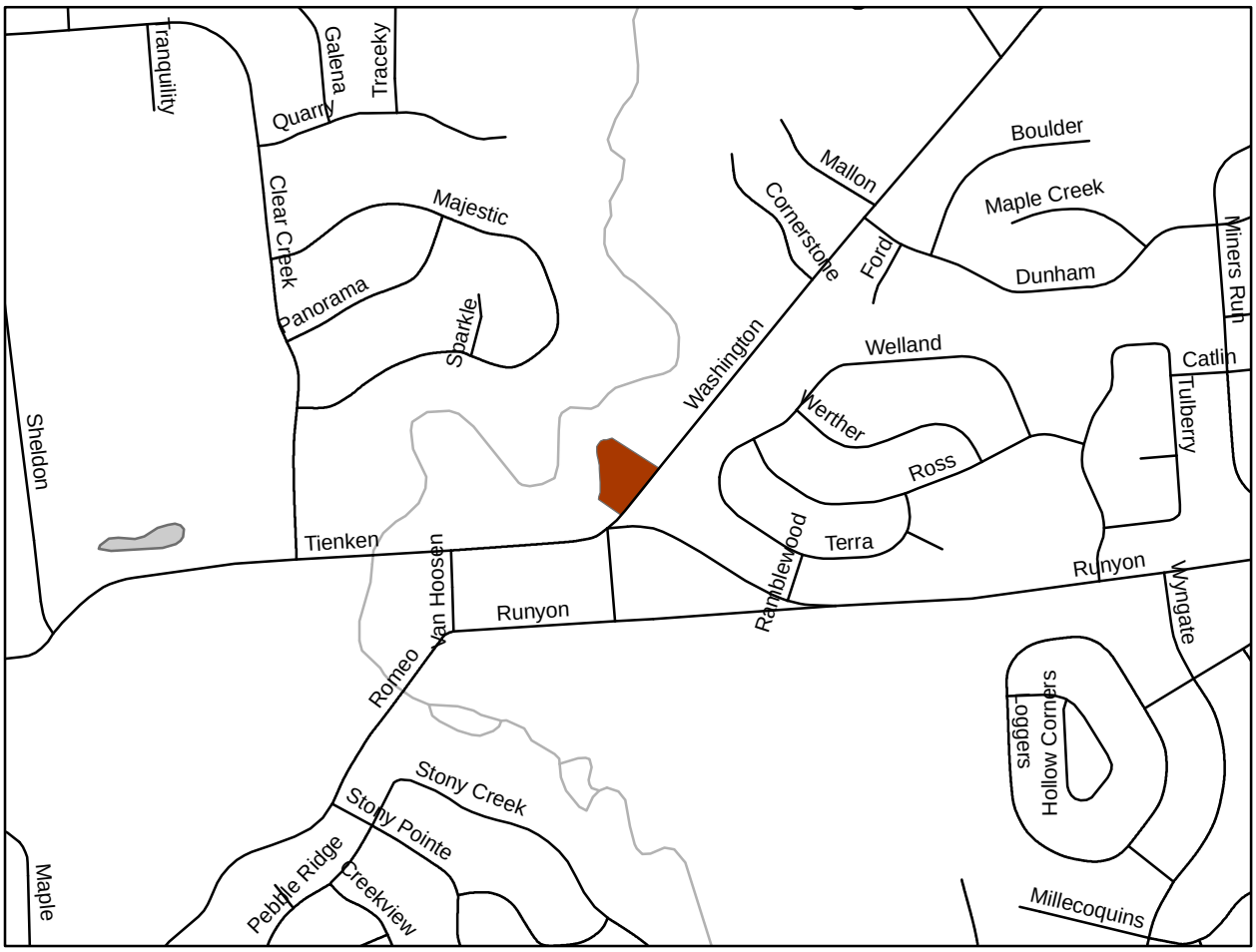


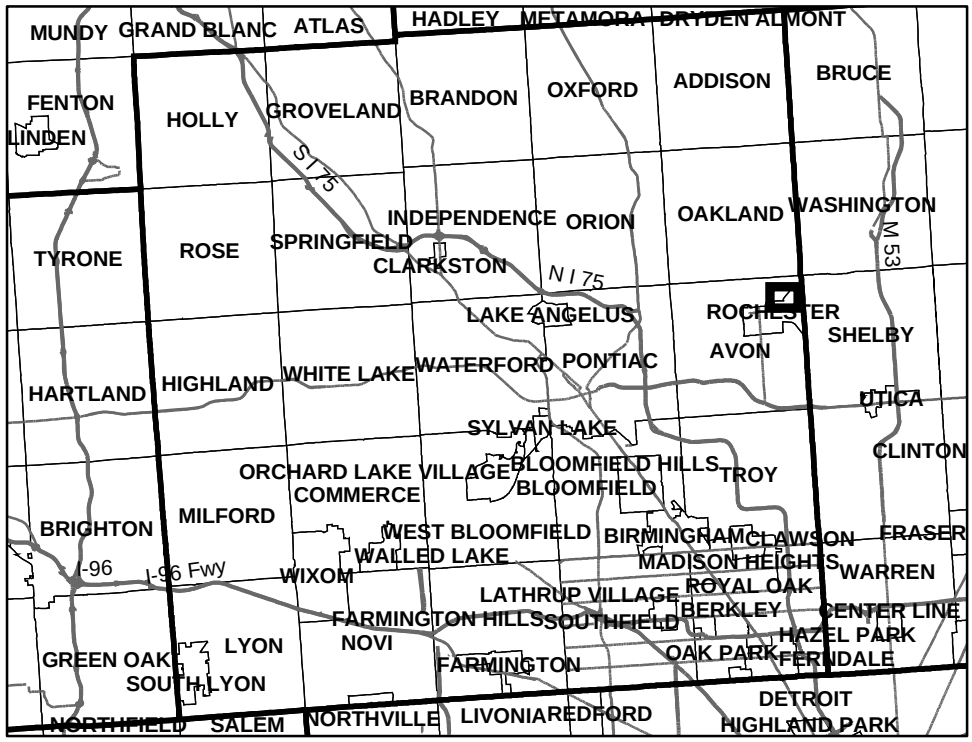
County Locator
Oakland County



Van Hoosen Property

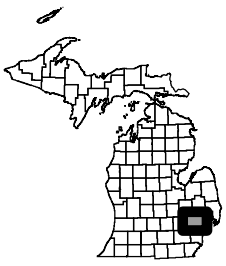
Oakland County, Avon Township, Section 1





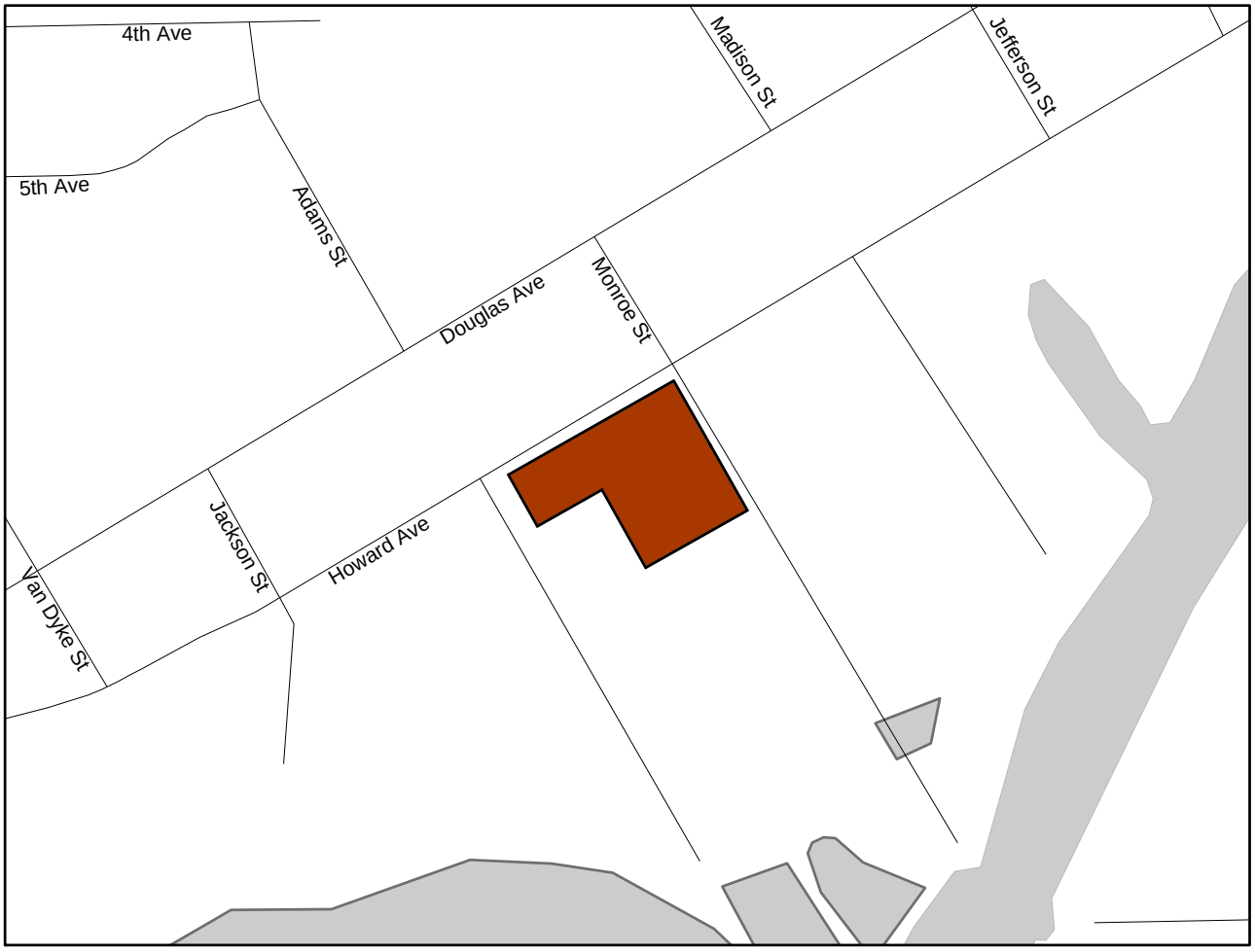
County Locator

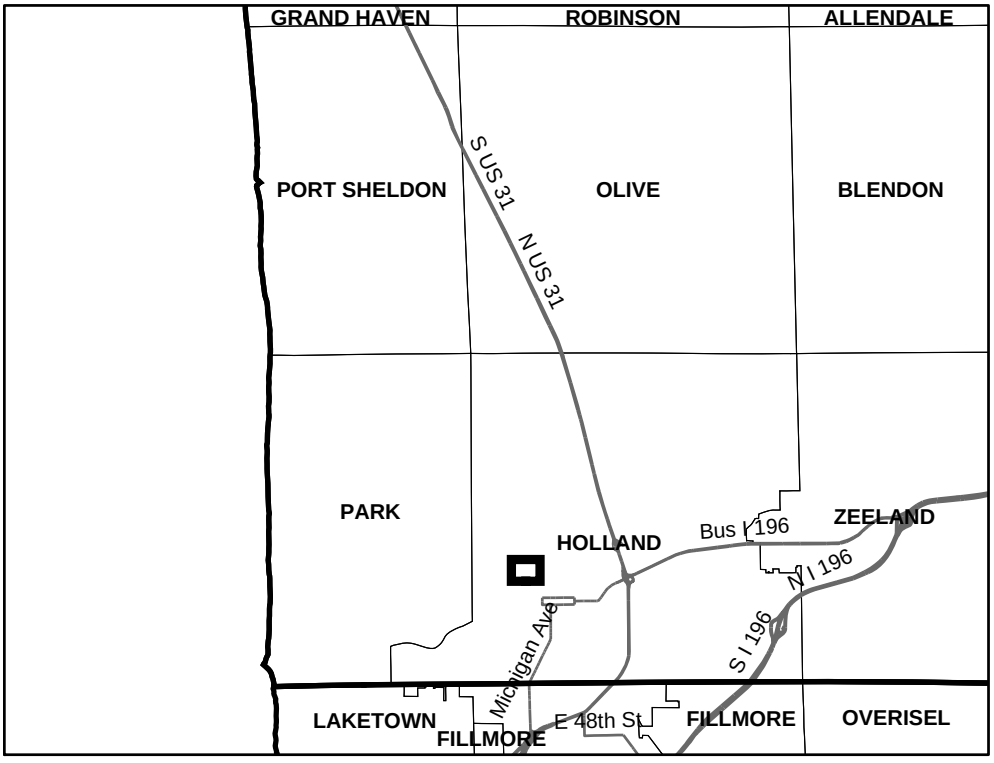
Oakland County



Holland Pfizer Property

Ottawa County, Holland Township, Section 19

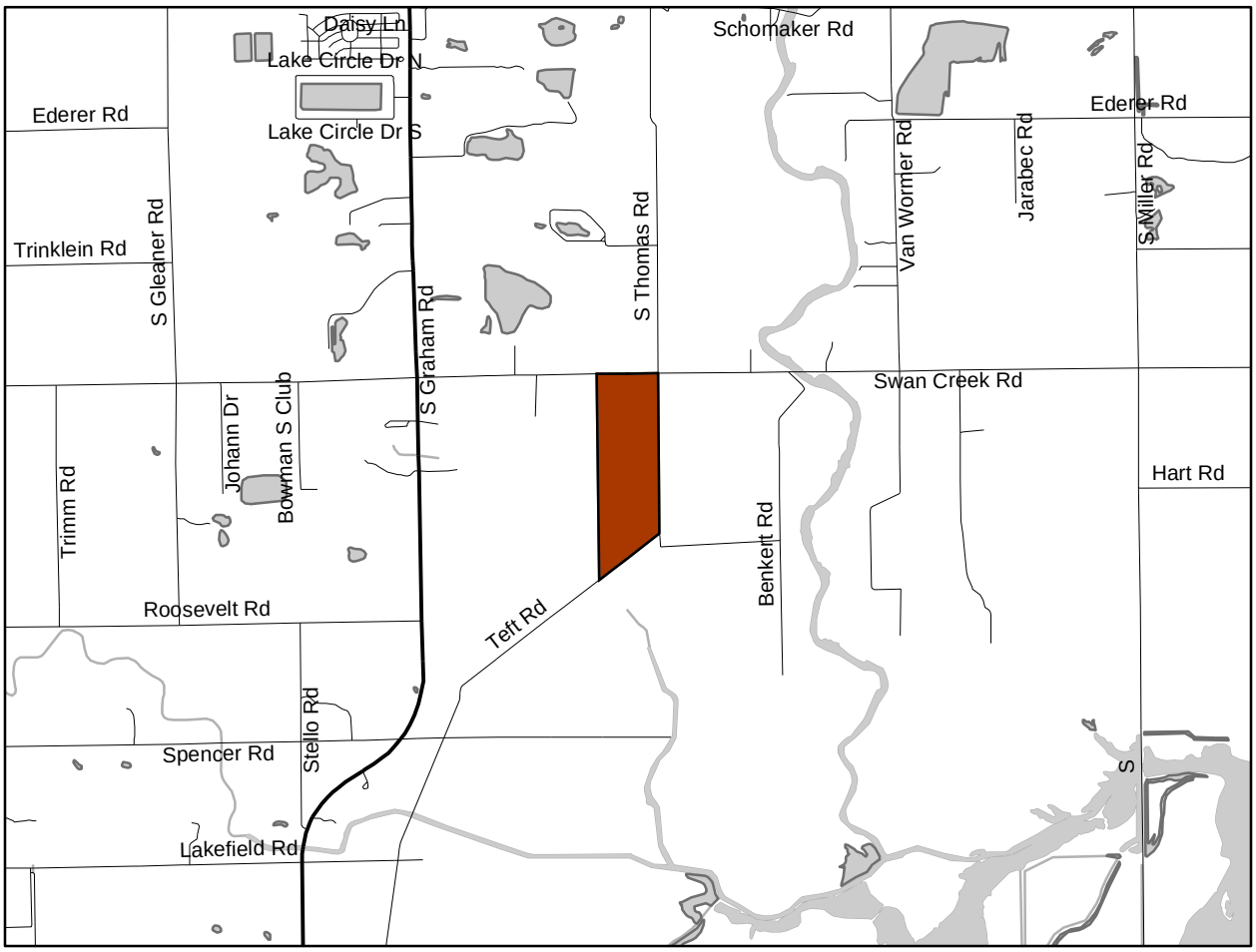


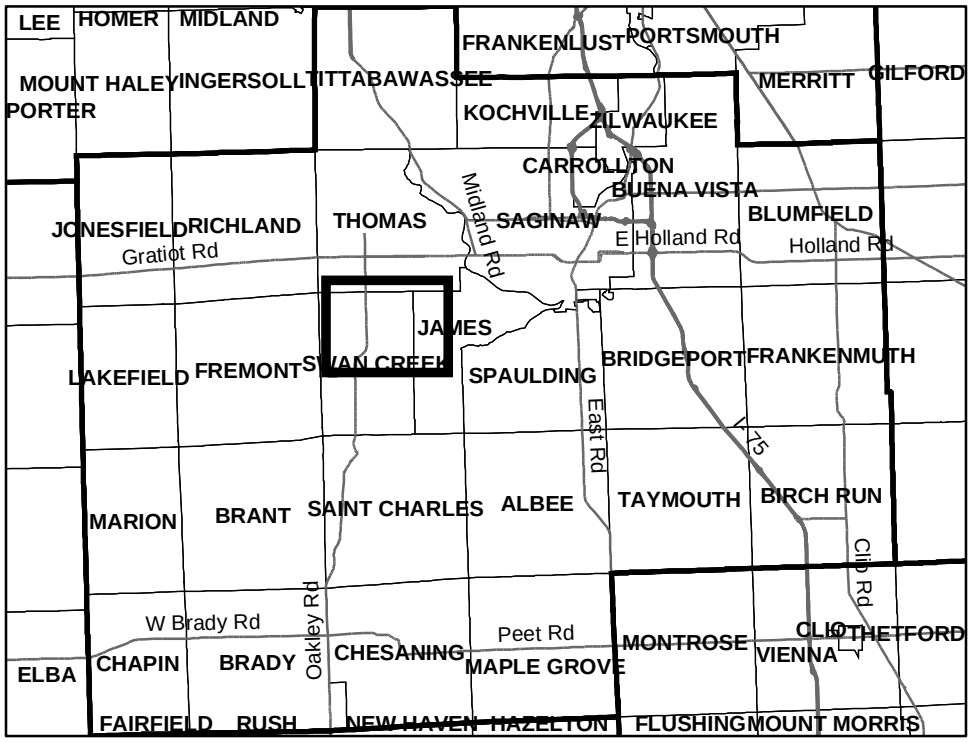


County Locator

Ottawa County

Saginaw Valley Bean and Sugar Beet Research Farm (Leased)
Saginaw County, Swan Creek Township, Section 9





County Locator

Saginaw County