



**Minnesota State University, Mankato
Campus Sustainability Plan
2010-2035**



December 20, 2010

Acknowledgements

The following graduate students were involved in the development of the Minnesota State University, Mankato Campus Sustainability Plan:

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We would like to thank the following professors who provided guidance and oversight in the development of the plan:

- David Laverny-Rafter, Ph.D., AICP
- Miriam Porter , DPA
- Perry Wood, Ph.D.

We would also like to thank the following groups and/or individuals who provided assistance during the development of The Plan:

- Daneille Alinea, Student Representative: Students for Sustainability
- Mark Anderson, Transit Superintendent, City of Mankato
- Paul Corcoran, Physical Plant Director
- David Cowan, Facilities Services Director
- Jeffrey Hafner, Consulting Arborist
- Cynthia Janney, Director of Residence Life
- Rosemary Kinne, Budget Officer
- Lawrence Kohanek, Director of Facilities and Planning
- Sean McGoldrick, Assistant Vice President of Facilities Management
- Peter Moe, Director of Operations: University of Minnesota Landscape Arboretum
- Randy Naprash, PE; Bonestroo, Rosene, Anderlik, and Associates, Inc.
- Dale Plemmons, Director of Environmental Health & Safety and Risk Management
- Laurie Woodward, Director of Centennial Student Union & Student Activities

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1.0 EXECUTIVE SUMMARY

1.1 INTRODUCTION

In the spring of 2010, a task force titled “Campus of the Future” was formed. This task force is a result of Minnesota State University, Mankato’s Strategic Planning Process of President Richard Davenport, and was developed to create a sustainable environment in the University by:

- Developing a pedestrian friendly and ecologically sensitive environment by providing welcoming and safe surroundings.
- Utilizing innovative and technological learning spaces.
- Ensuring community friendly learning, gathering, and collaborative places by developing green and energy conscious facilities and outdoor areas.

The charge of the Campus of the Future Task Force is to develop a set of objectives that will accomplish the intended outcome of the strategic priority. The following are the set of objectives developed by the Task Force:

1. Create a campus culture supporting energy efficiency, resource conservation and sustainability.
2. Create a welcoming and safe physical campus that is pedestrian and multi-modal friendly.
3. Create welcoming, comfortable and safe interior spaces that promotes collaboration in learning.

In order to further advance these objectives, the Urban and Regional Studies Institute Studio class (URBS 667) for the Fall Semester of 2010 developed a Campus Sustainability Plan for Minnesota State Mankato.

In addition, this plan will assist the University in designing the campus as a destination within the city, improving circulation, increasing walkability, creating green gathering places, and anticipating future growth. Street design and building placement will incorporate infrastructure to ensure a high level of pedestrian activity and create a vibrant edge to the campus. This plan proposes a “gateway” to the school, drawing visitors into the center of campus.

1.2 MISSION STATEMENT

Minnesota State University, Mankato is committed to being a sustainable campus through the preservation of energy and the environment through awareness, research, and action.

1.3 THE PLAN

This Campus Sustainability Plan is designed to provide a framework to guide sustainability strategies on campus for the next 25 years. Five sustainability topics were identified (Engagement, Land Use, Transportation, Green Campus, Energy Efficiency) and goals, objectives, and strategies were developed for each topic area. It is important to note that while these goals, objectives, and strategies have been developed, they are not comprehensive and sustainability is a dynamic process. This document is designed to be a starting point and further goals, objectives, and strategies should be continually explored.

Minnesota State Mankato is in a position to be a leader in sustainability in the Minnesota State Colleges and Universities (MNSCU) system. Through the process of developing an approved Campus Sustainability Plan, the University will have a vision for both short- and long-term sustainability along with specific actions and strategies based on the five sustainability topics developed to achieve this vision. The following are summaries of the long-term visions for each of the five sustainability topics along with goals that were developed to achieve those visions. Each sustainability topic is discussed in more detail in the body of the plan.

Engagement

The vision of engagement is to ensure institutional policies and procedures will cultivate and maintain a culture of sustainability with decision makers and allow for self reflection and self awareness to ensure policies and procedures are continually realigned to maximize the implementation of sustainability directives.

Goal 1: Increase awareness and involvement of staff and students.

- Awareness and involvement are a necessary component to maintaining a culture of sustainability and furthering the University's sustainability goals.

Goal 2: Create structure for institutional and community commitment.

- A Sustainability Council is pivotal to the structure of the ongoing sustainability effort at Minnesota State Mankato.

Land Use

The vision of land use is to provide a campus that is well-balanced between development and open space to enhance the quality of life for students, staff, and the greater Mankato community.

Goal 1: Create a welcoming and safe physical campus that is pedestrian and multi-modal friendly.

- The Campus Sustainability Plan will support alternative modes of transportation, such as biking and walking, and promote livability by increasing physical activity and decreasing vehicle use.

Goal 2: Implement a mandatory review process for land and building developments.

- Ensure that all future land and building development is consistent with guiding principles and a designed process to ensure progress towards sustainability at the site level.

Goal 3: Decrease the visual and spatial impact of surface parking on campus.

- In its current form, parking at Minnesota State, Mankato's campus is aesthetically objectionable and environmentally unsustainable. Decisions to reduce total parking area will increase the usage of alternative transit modes, promote physical activity, and make land available for other uses.

Goal 4: Balance preservation of the Arboretum/Bell Tower Open Space Area with development demands.

- Maintaining open space areas alongside developed areas to enhance the quality of life.

Goal 5: Protect the natural environment by devoting land space to the natural landscape.

- Identify open spaces that are water efficient such as ponds, waterways, rain gardens, community gardens, native planting landscapes and natural open spaces for gathering.

Transportation

The vision of Transportation is for the Campus to promote and support a safe, efficient, and sustainable transportation network that integrates all modes of transportation.

Goal 1: Increase pedestrian and non-motorized safety and accessibility.

- Integrate complete streets principles and address pedestrian safety issues.

Goal 2: Create a sense of place for students and staff at Minnesota State Mankato.

- Incorporate landscaping and streetscaping design principles to make the University a more inviting place.

Goal 3: Increase public transit ridership amongst students and staff.

- Improve accessibility and create more options for bus travel for University students and staff.

Goal 4: Reduce parking demand on campus.

- Promote alternative modes of transportation other than single occupancy vehicles.

Green Campus

It is the vision of Green Campus to visually enhance the aesthetic appeal of campus by incorporating sustainable planning practices that will become a long-lasting ideal for Minnesota State Mankato. Through the use of sustainable practices such as green roofs, tree infrastructure, green boulevards and landscaped parking lots, the University can reduce its carbon footprint, and at the same time, increase its livability.

Goal 1: Establish guidance on green roofs.

- Green roofs are structural components that capture, filter, and detain rainfall. The addition of green roofs on campus will reduce storm water runoff, peak discharge rate, pollutant loading, runoff temperature, building energy use, urban heat index, and enhance site aesthetics.

Goal 2: Utilize more plant species native to Southern Minnesota.

- The campus should utilize grass, plants and trees that are native to the area. This change to the landscaping will allow for a higher rate of storm water absorption, will require less maintenance, and will be less susceptible to disease and invasive pests.

Goal 3: Establish guidance on locating, planting, and caring for trees within the campus infrastructure to ensure long-term viability while maximizing tree benefits.

- Campus planners should utilize and treat trees as infrastructure on campus to protect the environment and promote sustainability by conserving energy, water, and other resources, and for climate mitigation.

Goal 4: Increase the amount of landscaped parking lots on campus.

- By utilizing landscaping features, parking lots do not have to be ugly and barren. Also, by implementing sustainable landscaping features, the University can reduce the impact that parking lots have on the environment.

Energy Efficiency

The vision of Energy Efficiency is to create nationally recognized programs that serve to conserve energy, educate the student body, and generate renewable sources of power.

Goal 1: Reduce the impact Minnesota State Mankato facilities have on the environment.

- Given the large number of students, faculty, and staff that frequent the University campus, as well as the facilities and infrastructure that have been built to support them, it is unavoidable that the campus will disrupt the natural ecological cycles of its site. Therefore, it is imperative for the campus to minimize these impacts.

Goal 2: Reduce the amount of non-renewable energy Minnesota State Mankato uses.

- It is important to decrease the energy needed to power campus facilities, conserve energy used on campus, and to examine options for energy self-sufficiency.

1.4 PLAN IMPLEMENTATION

The implementation of the Campus Sustainability Plan should be conducted by senior administration under the guidance of the Campus Planning Committee, and the guidance of the new Sustainability Council recommended in this plan. With the responsibility of implementing the plan lying within the highest office on campus, it instills the idea that sustainability is a high priority of the University.

1.5 CURRENT PLANNING AND OPPORTUNITIES

Minnesota State Mankato has conducted sustainable planning practices in the past, but also has many potential opportunities to increase the sustainability of the campus [SEE FIGURE 1].

Minnesota State Mankato Sustainable Planning Practices		
	Current Planning Practices	Potential Opportunities
Engagement	<ul style="list-style-type: none"> • President’s Initiative “<i>Building the Campus of the Future</i>” 	<ul style="list-style-type: none"> • Creating a more engaged student campus body • Developing more effective communication between campus leaders on sustainability
Land Use	<ul style="list-style-type: none"> • The University Master Plan 	<ul style="list-style-type: none"> • Decrease the visual impact and limit the spatial growth of parking • The use of low-impact-development techniques • Creation of a development review process • Addition to open spaces that would encourage more utilization
Transportation	<ul style="list-style-type: none"> • MATAPS 	<ul style="list-style-type: none"> • Development of safer intersections at the corners of the campus • Emphasize transit and multi-modal transportation and deemphasize the automobile • Utilize landscaping design to emphasize and encourage a pedestrian themed campus
Green Campus	<ul style="list-style-type: none"> • The University Master Plan 	<ul style="list-style-type: none"> • The use of rain gardens, bio-swales, and permeable pavement • Construction of green roofs • The use of trees as infrastructure with consideration of species, shading, and canopy • Planting of native grasses, plants, and trees in favor of foreign vegetation
Energy Efficiency	<ul style="list-style-type: none"> • B3 Benchmarking (Building, Benchmark, Beyond) • PBEEP (Public Building Enhanced Energy Efficiency Program) 	<ul style="list-style-type: none"> • Examine the potential for the campus to generate its own power • The use and development of alternative energy generation such as solar and geothermal • The reduction of green house gasses

Figure 1: Minnesota State Mankato Sustainable Planning Practices

2.0 BACKGROUND

2.1 BACKGROUND ON SUSTAINABILITY

As defined by the Brundtland Report adopted by the U.N. World Commission on the Environment in 1987, sustainable development is “meeting the needs of the present without compromising the ability of the future generations to meet their own needs.” This definition was adopted to Minnesota law in 1996 with the addition of, “maintains or enhances economic opportunity and community well-being while protecting and restoring the natural environment upon which people and economies depend.”

Sustainable development has three key elements:

1. Ecology: Environmental considerations must be addressed and be placed equally with economic objectives.
2. Equity: Social equity must ensure redistribution and conservation of resources not only within today’s society, but to ensure fair distribution between generations.
3. Economy: Development does not simply mean “growth.” Development includes qualitative as well as quantitative improvement.

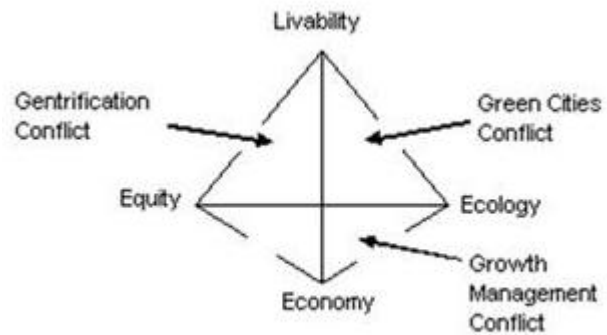


Figure 2 diagram represents the sustainability prism which displays the conflicts that arise between these three key elements of sustainable development.

Figure 2: Sustainability Prism

- Growth Management Conflict: Arises from competing beliefs in the extent to which unmanaged development, bound only to market principles, can provide high quality living environments.
- Green Cities Conflict: Arises from competing beliefs in the primacy of the natural versus the built environment and the extent of which ecological systems should determine the urban form.
- Gentrification Conflict: Arises from competing beliefs in the preservation of low-income urban neighborhoods for the benefit of their present populations versus their redevelopment to attract middle- and upper-class populations back to the central city.

Sustainable development emphasizes a balance between the environment, economy, and social equity in the present and future. When planning for sustainability, issues must be looked at beyond the project level and be taken into the larger community context.

2.2 HISTORY OF CAMPUS SUSTAINABILITY

In the past, Minnesota State Mankato has not had a sustainability plan outlining actions to be taken. President Richard Davenport has, since his 2009 convocation address, expressed an increasing desire for Minnesota State Mankato to set forth bold and exciting strategic priorities that will make the University a more sustainable environment.

2.3 COMMUNITY CONTEXT

The University's 350-acre campus overlooks the Minnesota River Valley and the city of Mankato. Located in south central Minnesota, Mankato is a fast-growing community of 50,000 just 80 miles south of Minneapolis and St. Paul.

Mankato, a progressive and student-friendly community, consistently ranks as one of the most livable communities in the country. The city was recently designated a "dreamtown", named the 14th most livable micropolitan city, 16th in the nation for quality of life, and one of the top 100 for young people. Rolling Stone magazine even ranked Mankato as one of the top 50 college towns for "schools that rock" for the area's rich and diverse music scene.

The community, like the campus, is large enough to offer all the opportunities and advantages that are expected from a larger city — top-notch recreational opportunities, sporting events, shopping, festivals, restaurants, diverse cultural attractions and a vibrant nightlife — but in a convenient, accessible and easy-to-navigate setting.

With a spectacular natural environment as a backdrop, Minnesota State Mankato and the community come together to create an ideal environment for living, growing, working and learning.

3.0 GOALS, OBJECTIVES, AND STRATEGIES

3.1 ENGAGEMENT

3.1.1 Current Practices

Over the past two years the University has been seeking ways to improve campus sustainability. Under the President's Initiative, "*Building the Campus of the Future*" the sustainability efforts have gained a campus wide voice. However, the lack of effectively communicating that voice throughout all levels of the campus weakens the power of the sustainability initiative. In order to capitalize on opportunities and minimize threats affecting the initiative, properly engaging the student body, community and university leaders is imperative.

3.1.2 Long Term Vision

The vision of Engagement is to ensure that institutional commitment is maintained through the coordination of policies and procedures that seek to cultivate and preserve a culture of sustainability within decision makers, staff and students at the University. This includes perpetuating self reflection and self awareness to continually realign policies and procedures that maximize sustainability efforts.

3.1.3 Goals, Objectives, and Strategies

GOAL 1: Increase Awareness and Involvement.

Awareness and involvement are necessary components to maintaining a culture of sustainability and furthering the University's sustainability goals.

OBJECTIVE: Increase students' knowledge of sustainability and increase their involvement in campus sustainability initiatives.

The University has a responsibility to educate students on global movements like sustainability. It is through their engagement that they will become a catalyst to propel the campus sustainability movement.

SHORT-TERM STRATEGIES:

- Increase awareness through the dissemination of educational materials. Connect the Student Activities department with the sustainability initiative and have them create

educational materials and awareness initiatives such as pamphlets, posters and campus events focusing on sustainability issues.

- Enlist the participation of Registered Student Organizations on campus. Directly engage Registered Student Organizations with a sustainability or related focus, such as Students for Sustainability, in the sustainability initiatives.
- Distribute student directed educational materials. Some educational materials will be created by students with a focus on that month’s spotlighted topic. Prizes should be offered to encourage involvement and self directed study on sustainability issues.
- Establish funding for educational materials. To ensure pamphlets and posters are created the university must reserve adequate funds to advertise and advocate to students. Funding levels will fluctuate per semester based on the issues that are chosen to address.

LONG-TERM STRATEGIES:

- Maintain educational campaign effectiveness through spotlighted issues. In an effort to maintain relevancy and to stave off constituency’s apathy, a new sustainability issue should be spotlighted each month that classes are in session [SEE FIGURE 3].

- Form campaigns to combat specific sustainability issues through student engagement. One issue previously outlined in “*Building the Campus of the Future*” is an “awareness campaign to reduce ‘parasitic’ electrical consumption”. This would be the focus of one initiative to combat sustainability issues. For example, the University could install energy meters or display energy usage date and create a competition between segments of student housing to see who can reduce their electrical consumption by the largest percentage. Upon establishing one campaign further campaigns would take similar formats, focus on spotlighted issues and occur on a semester basis.

Potential spotlighted topics:

- What’s Recyclable, What’s Not
- Energy Use on Campus
- Permeable Pavement
- Food Service Waste Reduction on Campus
- Land Use
- Pedestrian friendly vs. Auto Centric Campus
- Alternative Transportation Options
- Benefits of Composting
- Benefits of Community Gardens
- Benefits of Native Prairie plantings

Figure 3: Spotlighted sustainability topics

- Establish Sustainability Engagement courses in relevant departments. Such courses would focus on teaching students the “how to” in a format that could be transferred to real world careers. Potential courses could include: Maintenance of Sustainable

Landscaping as a Biology course, Sustainable Re-zoning as an Urban & Regional Studies course, and Economics of Sustainability for the College of Business. Another option would be to add a sustainability component to an existing course, such as: Installation and Maintenance of Rain Gardens could be added to the material covered in Environmental Assessment, offered by the Environmental Science Department.

OBJECTIVE: Improve the awareness and involvement of the greater campus community.

The university will play a facilitator role by offering avenues for community engagement and disseminate relevant information to community stakeholders to minimize redundancy and establish a stronger culture of sustainability.

Strategies:

- Establish a community stakeholder committee, named Campus Community Sustainability Crew (“The Crew”, for short). This committee allows area housing, commercial developments, the University, and others to be engaged and establish lines of communication about sustainability issues.
- Coordinate community sustainability initiatives in the adjacent campus community. This will include offering ideas for programs and initiatives that are focused toward the stakeholders needs, such as recycling initiatives for housing developments or composting ideas for restaurants.
- Offer community recognition for implementing sustainable initiatives. By creating a “sustainable neighbor” list for area housing developments and commercial establishments that implement sustainable measures, University staff and students have the power to choose to support sustainable establishments and thus encouraging the community to implement sustainability measures.

OBJECTIVE: Increase staff awareness.

To ensure each department is supporting a culture of sustainability increasing staff awareness is important

SHORT-TERM STRATEGIES:

- Develop a Sustainable Staff Newsletter. The newsletter will focus on how departments and individual staff can easily implement small initiatives to address a variety of sustainability issues.
- Inform staff of sustainability’s benefits. Use the Sustainable Staff Newsletter to advocate for the benefits of larger campus wide sustainability initiatives

LONG-TERM STRATEGIES:

- Establish a Campus Green Month each September. During this month, staff would have options to attend short informational meetings about how to become more sustainable in an academic and office setting.
- Develop a staff Sustainability Training Committee. This committee can create the topics and material needed for the Campus Green Month informational meetings. They will also work with individual departments to help establish better business practices that improve the sustainability of the departmental operations

GOAL 2: Structure institutional and community commitment.

OBJECTIVE: Develop a Sustainability Council

The Sustainability Council will be a University entity with the authority to advocate for, and be proactive in ensuring the Campus Sustainability Plan is implemented, amended and enhanced as needed. They will be guided by a mission to be proactive in educating, promoting, guiding, evaluating and ensuring compliance with the Campus Sustainability Plan and general sustainability issues.

SHORT-TERM STRATEGIES:

- Rename the Campus of the Future Task Force as the Sustainability Council. A new name will maintain a clear focus on the objectives and their relation to sustainability.
- Establish the Sustainability Council as a permanent council. This will help ensure there is a permanent entity addressing campus sustainability issues.
- Select Sustainability Council Members. The Sustainability Council shall be comprised of campus staff from a variety of backgrounds, selected by the President. **[SEE FIGURE 4]**

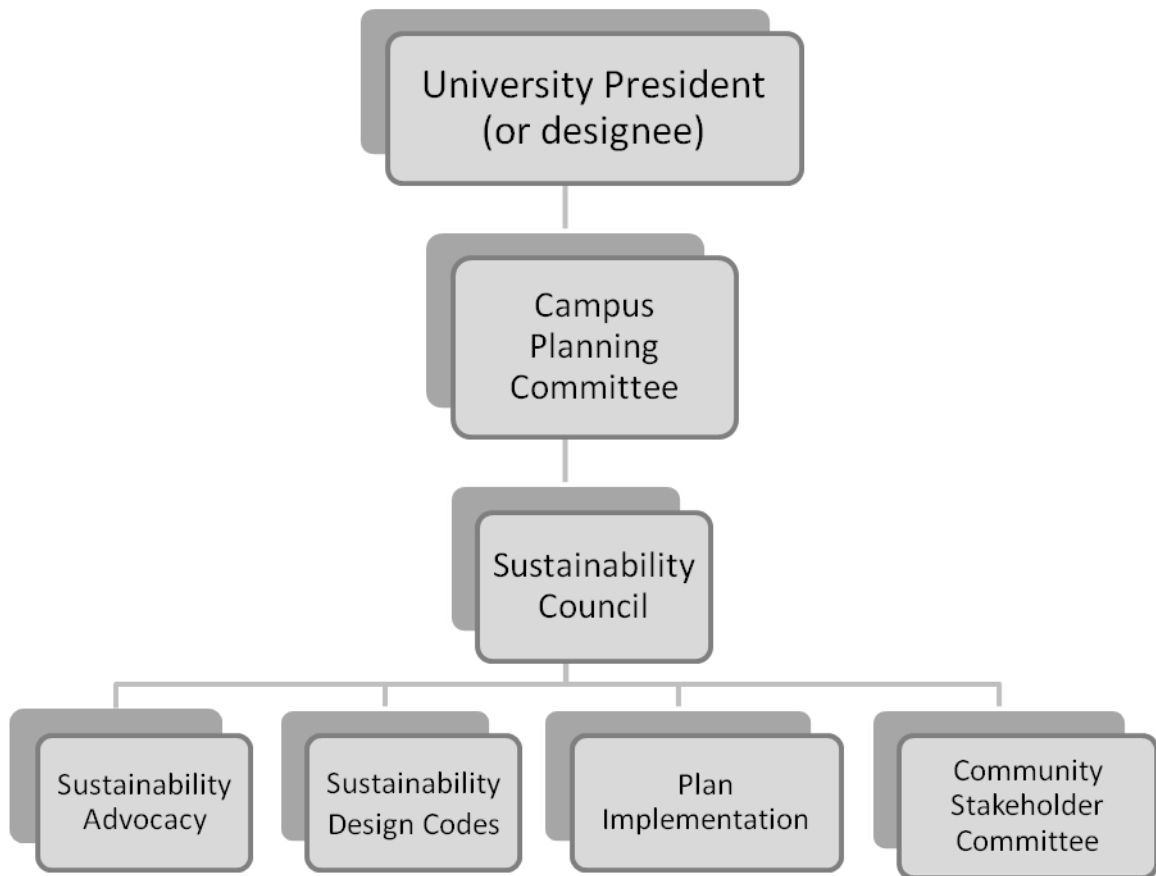


Figure 4: Institutional hierarchy of the Sustainability Council

LONG-TERM STRATEGIES:

- Advocate for policy changes on campus, MnSCU, and at the State level. To ensure the highest level of sustainability the Sustainability Council should encourage policy changes at all levels which make implementation easier, more efficient and/or more effective.
- Ensure continued and accurate implementation of the Plan. The Sustainability Council should ensure the University and related departments are implementing the Plan and following its guidelines.

OBJECTIVE: Establish a Green Fund.

A Green Fund is a revenue source that is solely dedicated to future sustainability initiatives. These funds will be utilized to further future sustainability projects that focus primarily on increasing savings (through decreasing energy use) or on other sustainability measures as outlined in the Campus Sustainability Plan.

SHORT-TERM STRATEGIES:

- Capture cost cutting savings as the University installs more efficient energy saving mechanical elements in buildings, which will be returned to the Green Fund for a period of five years.
- Redirect unused Student MavPrint funds and deposit into the Green Fund.
- Dedicate a portion of general funding. To further the University's commitment to sustainability there should be a match on all captured savings and also a dedicated portion of the University's budget (e.g. parking fees) should be deposited into the Green Fund.

LONG-TERM STRATEGY:

- Advocate for a dedicated Sustainability Funding Source by seeking changes and support at the state level to establish a dedicated state funding source for the University's Green Fund.

3.2 LAND USE

3.2.1 Current Practices

Effective arrangement of land use for a sustainable campus requires examination of both the campus and the surrounding area. The University Master Plan approaches land use in this way, identifying existing campus property and buildings, roads and parking, adjacent commercial areas, adjacent single- and multi-family residential areas, churches, and institutions. The Master Plan also arranges campus into several precincts: academic, support, athletic and recreation, athletic and academic, residential, and service. Although the University considered the potential of mixed uses within campus buildings, ultimately it was determined that separation of uses is appropriately suited to the compact and walkable nature of the existing building layout.

Land use is less tangible than some other aspects of sustainability, but it is at the heart of several important areas of concern. A primary concern of University students and staff is parking. Because parking consumes a large amount of space on campus, students, faculty, and staff are constantly made aware of its presence. Ideally, the University should strive to decrease the visual impact of parking and limit or reverse its spatial growth. Lot 14 [SEE FIGURE 5],

constructed on a green space adjacent to a residence hall was recently built. This parking lot was designed without consideration of low-impact development techniques, and it served as the impetus for creating a development review process which has been incorporated into this section.



Figure 5: Lot14 was developed with little attention to sustainability.

The usage of the Bell Tower Open Space, also called the campus Arboretum should also be considered. An Urban Studies Studio project in Fall 2007, analyzed the opinions of University staff and students on the use of the Arboretum through two types of surveys. Although the study's outcome was largely inconclusive, respondents favored natural and pedestrian-friendly design and amenities. Respondents did not oppose the then-proposed Trafton addition (Ford Hall), but were somewhat against further building development. It should be noted that

respondents placed higher value on parking than open space, indicating some receptiveness to development. Consistent with these mixed feelings, this plan recommends a combination of development and preservation in the Arboretum.

Outside of the Arboretum, many campus open spaces are not being utilized other than for aesthetic value or informal recreation and relaxation. More benefits and a higher usage rate may be realized by identifying specific uses that are well suited to specific open space areas. One such use is the community garden. Such gardens are commonly used as showcases for sustainability. Community gardens can promote learning, community interaction, and produce healthy, natural, locally sourced foods. Therefore they are addressed in the goals below. Other open space improvements are also recommended for consideration.

3.2.2 Long Term Vision

Through the implementation of sustainable land use, Land Use aims to provide a campus that is well-balanced between development and open space and to enhance the quality of life for students, staff, and the greater Mankato community.

3.2.3 Goals, Objectives, and Strategies

GOAL 1: Create a welcoming and safe physical campus that is pedestrian and multi-modal friendly.

The Campus Sustainability Plan will support alternative modes of transportation, such as biking and walking, and promote livability by increasing physical activity and decreasing vehicle use.

OBJECTIVE: Establish defined gateways to the campus.

STRATEGIES:

- Improve campus boundary recognition and community welcome to campus.
- Construct entrance features at the four campus entrances (see Master Plan).
- Gather stakeholder input through public workshops to ensure redevelopment meets present and future needs.

OBJECTIVE: Create a “people-centric” mall.

STRATEGIES:

- Increase the amount and variety of seating styles available on the mall. This could include table-and-chairs, along with traditional and mixed-use benches, such as retaining walls and planters (currently in place surrounding Armstrong Hall).
- Complete a mall upgrade pre-design to seek campus community input and prepare a phased implementation plan with cost estimates. To begin the process, University officials should refer to the identified mall redesign created by I&S Group[SEE FIGURE 6].



Figure 6: Campus Mall Redesign Concept, I & S Group

GOAL 2: Implement a mandatory review process for land and building developments.

Ensure that all future land and building development is consistent with sustainability principles and a design process to ensure progress towards sustainability at the site level.

OBJECTIVE: Define guiding principles to assist in planning land use development.

Establish a Sustainable Development Checklist (SDC) to be completed by facilities staff, during planning for each construction, demolition, renovation, or site alteration project on campus. The initial responsibility for the creation, adoption and administration of the SDC will be with the proposed Sustainability Council, mentioned in this Plan.

STRATEGIES:

- Using the Sustainable Development Checklist, determine whether a project will have significant impacts on the natural environment or land use patterns. Parameters may include, but are not limited to, changes to the building footprint, expansion or reduction

of parking, and modification to building utility systems addressed in the Energy Efficiency portion of this Plan.

- Establish a scoring method for the SDC to determine what percentage or set of parameters must be met for a project to pass the checklist and proceed without further oversight.

OBJECTIVE: Develop a Sustainability Impact Assessment (SIA) process for all projects that fail to pass SDC.

Some projects on campus may not pass the SDC process. In this case, an assessment of the project should be made to determine the impact on sustainability before proceeding. The SIA will be developed by the Sustainability Council, and will include a set of request for proposal (RFP) specifications that must be met by project bidders.

STRATEGIES:

- Develop a detailed set of sustainability requirements in the areas of energy efficiency, site-level pollution management, and efficient land use, and others deemed appropriate, to be met by all projects subjected to SIA.
- Ensure that building construction and site development requirements in the SIA are derived from and compatible with the goals and objectives in the individual sections of this Plan.
- Prohibit any development project that is deemed to have too high of an impact on the environment. The plans for these projects should be returned to facilities/planning staff for refinement before construction or development may begin.
- Incorporate the SIA requirements in future Facilities Master Plans to promote easy attainment of SIA requirements by future projects.

GOAL 3: Decrease the visual and spatial impact of surface parking on campus.

In its current form parking Minnesota State, Mankato’s campus occupies an excessive amount of space and has negative aesthetic impacts on surrounding areas [SEE FIGURE 7]. Decisions to reduce total parking area will increase the usage of alternative transit modes, promote physical activity, and make land available for other uses.

PARKING OVERVIEW

*Due to the breadth of the issue, **Parking** is addressed in multiple sections of this Plan.*

Land Use addresses screening & redevelopment.

See **Transportation** for demand management.

See **Green Campus** for physical lot design.

OBJECTIVE: Prohibit the construction of additional parking lots, pending a significant increase in student enrollment.

STRATEGIES:

- Prohibit the construction of parking lots at campus arrival points (as identified in Master Plan). This will create a more welcoming environment to campus arrival.
- Prohibit construction of surface parking or single-use parking structures (i.e. those that do not include housing, retail, or other uses promoting sustained activity) in front of street-facing buildings.
- Identify development opportunities for the Free Lot (Lot 23) site. For example, consider sale to a private developer for student housing or retail.
- Identify alternative development opportunities for the Gage Towers site in lieu of parking construction.
- Construct replacement parking lots as necessary without exceeding the current number of total parking spaces.



Figure 7: Current parking lots are unattractive and negatively affect the aesthetics of surrounding areas.

OBJECTIVE: Enact standards requiring landscaped screening at borders of surface parking.

STRATEGIES:

- Apply the standards of the Minnesota Environmental Quality Board to all new lots [SEE APPENDIX A].
- Use any future parking fund surpluses to apply standards to existing lots including the Lot 20 demonstration project proposed in Green Campus below.
- After redesigning Lot 20, prioritize improvements for other lots that abut street rights-of-way.

OBJECTIVE: Utilize campus buildings as a screening device for parking.

STRATEGIES:

- Where campus buildings are proposed for locations outside the campus core, construct them near or on top of existing parking lots with the façade built to a street right-of-way.
- Where parking is retained to the rear of the building, this type of construction may substitute for landscaped screening.

OBJECTIVE: Develop combination parking and housing structures with ground floor retail in selected locations.

STRATEGIES:

- Replace proposed parking structures on Stadium Road in 20-year Master Plan with mixed use structures that include a parking component. For example, in Winooski Falls, VT, Spinner Place is a U-shaped student housing complex surrounding a parking structure [SEE FIGURE 8].
- Conduct a student survey to gauge interest in this type of housing, with special attention given to the need and potential for family housing.
- Contact retail and student housing management companies who are active in the Mankato area to gauge interest in leasing space in such a structure. Special effort should be made to attract a grocery retailer, as this is a major unfulfilled demand in the campus area.
- Reserve parking within the structure for its residents and retail customers, with the goal of preventing an increase in on-campus parking.

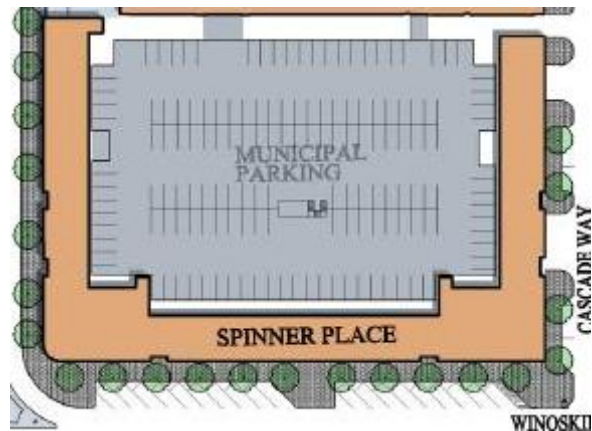


Figure 8: Spinner Place, using student housing to minimize the visual impact of parking.

GOAL 4: Balance preservation of the Arboretum/Bell Tower Open Space Area with development demands.

Maintaining open space areas alongside developed areas enhances quality of life.

OBJECTIVE: Develop academic buildings at the northeast and, if needed, southeast corners of the Arboretum as indicated in the 5-Year Master Plan.

STRATEGIES:

- Locate the buildings as close as possible to the corners of the Arboretum (closer than shown on the Plan Map) to preserve open space within [SEE FIGURE 9].
- Build the Allied Health facility to property lines at the Maywood Ave and Warren St intersection to capitalize on a high traffic location.

OBJECTIVE: Preserve and improve the remainder of the Arboretum as permanent open space.

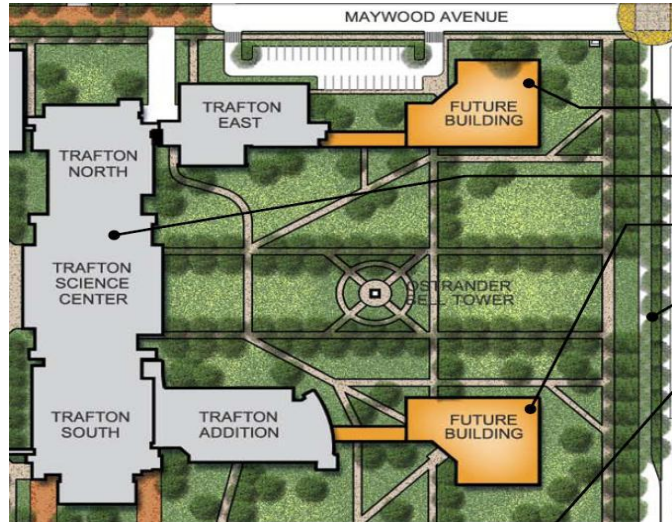


Figure 9: Buildings constructed in Arboretum are located at the corners to preserve open space.

The remainder of the Arboretum should be viewed as valuable open space at Minnesota State, Mankato. The University should continue to improve the aesthetics of the Arboretum, to maximize its usage.

STRATEGIES:

- Develop and reroute pedestrian and bike paths as needed based on evidence of changing patterns of circulation (e.g. wear patterns in grass).
- Include in the site budget for new buildings (above) significant funds for purchase of benches and pedestrian-scale lighting to be placed along the building edges facing inward towards the Arboretum.
- Along with the option to purchase paving bricks at the Bell Tower, offer alumni the opportunity to purchase benches in their name to be located in the Arboretum and marked with a nameplate.
- Landscape the small segmented open spaces separated by walkways surrounding the Bell Tower with native plants dominated by wildflowers.

GOAL 5: Protect the natural environment by devoting land space to the natural landscape.

Identify open spaces that are water efficient such as ponds, waterways, rain gardens, community gardens, native planting landscapes, and natural open spaces for gathering.

OBJECTIVE: Consider alternative uses for some open space to encourage personal interaction and a sense of community between the students and staff.

Most of the open space on campus is used for aesthetic appeal and informal recreation and relaxation. There are other more functional uses of open space that should be considered.

STRATEGIES:

- Conduct public workshops, to gather community preference of location. The addition of community gardens and other functional open space should be articulated and incorporated into the Master Plan.
- Identify locations for open space to be used as rain gardens, ponds, and waterways to assist in the dispersion of storm-water runoff.
- Allocate community garden space to interested student organizations for use by students and staff.

3.3 TRANSPORTATION

3.3.1 Current Practices

Major intersections at the corners of campus present the possibility of conflict between automobiles and pedestrians, placing students in danger, at times with tragic results. New solutions must be adopted at those intersections to address safety issues. Minnesota State University, Mankato has a young and mobile population with a positive view of public transit, walking, and bicycling. By deemphasizing automobile transportation, these other modes of transportation can greatly improve the lives of students and staff. By utilizing alternative modes of transportation, car ownership costs are reduced, and a healthier, environmentally friendly lifestyle is encouraged. Minnesota State Mankato and the City of Mankato need to work together to ensure the safety of pedestrians and bicyclists. According to the 2009 MATAPS survey, 18.5% of Minnesota State University Mankato commuters live more than an hour away from campus. However, the University lacks a tool for carpool coordination. The cost of parking on campus is lower than that of comparable universities in MnSCU which does not provide an incentive to use other modes of transportation.

Currently, Minnesota State Mankato has a pedestrian network that lacks uniformity, and in some places, basic landscaping design elements that would enhance the livability of the campus and create a sense of place. The aesthetic appeal of campus sidewalks, paths, and trails is important to consider when advocating for sustainability. These streetscaping measures increase the enjoyment of walking and contribute to the feeling of safety and security, especially at night. There is, however, potential in this area as Minnesota State Mankato has great natural spaces to showcase the character of our community and enhance the pedestrian experience for the student body.

Minnesota State University, Mankato is a potent force in the socio-economic development of Mankato. Students, faculty, and staff account for about 40% of the city's population, living on and around campus. This population is vital for the ridership of the transit system. However, the 2009 MATAPS study provides startling revelations of bus ridership trends among residents on and off-campus. On average, 88% of on-campus residents never use the bus for either work, recreation or other trips. This may be because about 70% of the respondents have vehicle access. Furthermore, only 14% of off-campus students and faculty use the bus in arriving and departing campus and only 10% are ready to use the bus if their normal mode of transportation was unavailable. The University offers students the opportunity to purchase the U-Zone semester bus pass to access the Mankato transit system. However, the service hours and routes are not designed for students to use the bus for shopping, entertainment, and transportation to work at

desired times. These trends and policies provide the basis to craft goals and objectives in improving bus ridership in and around campus.

3.3.2 Long Term Vision

The Campus transportation system should promote and support a safe, efficient, and sustainable transportation network that integrates all modes of transportation.

3.3.3 Goals, Objectives, and Strategies

GOAL 1: Increase Pedestrian and non-motorized safety and accessibility.

To address concerns of pedestrian accessibility and safety at Minnesota State Mankato, an examination of the “Complete Streets” philosophy to transportation design must be conducted. This philosophy encompasses the belief that all modes of transportation and all users of a transportation network must be accounted for when designing and redesigning urban streets. Complete Streets contribute a great deal to the surrounding community including safe, attractive sidewalks and well-defined bicycle routes that encourage healthy and active lifestyles. Complete Streets reduce the risk to pedestrians by designing streets that integrate sidewalks, medians, and traffic-calming measures. By integrating Complete Streets principles to our urban transportation networks we create more choices, reduce congestion, and reduce carbon-intensive modes of transportation all while increasing safety, comfort, and health of residents.

OBJECTIVE: Integrate complete streets principles at Minnesota State, Mankato.

Complete Streets would enhance the safety along Stadium Road, Ellis Avenue, Warren Street, Maywood Avenue, and Val Imm Drive.

STRATEGIES:

- Construct a raised median along Stadium Road to allow pedestrians to cross a single lane of traffic at a time, and create segregated bike lanes along the road by reducing the width of current traffic lanes. This will reduce the speed of traffic on Stadium Road.
- Add a bike lane along Ellis Avenue beginning at the new recreation fields south of Stadium Road, and continuing to Wigley Administration Building.
- Stripe the remaining traffic lanes on campus to indicate bicycles share the road with vehicle traffic.
- Coordinate with City of Mankato and Blue Earth County to integrate Complete Street principles at the Gateways to MSU; Val Imm Drive, Stadium Road, and Stoltzman Road.

Create bike lanes and sidewalks along Stadium Road. MATAPS has identified a new alignment for the eastern end of Stadium Road that brings the terminus in alignment with Highway 83. This greatly increases the opportunity to connect bike lanes and sidewalks with new housing developments in East Mankato.

OBJECTIVE: Address pedestrian safety concerns on campus.

There are some places on campus where it is not very safe to walk.

STRATEGIES:

- Build sidewalks down the center of the parking lots to allow pedestrians to walk safely along the road, rather than on the road with auto and bus traffic. Though the 20-year Master Plan addresses this issue, more immediate action is needed; snow piles in the winter months force students to walk along this narrow road with heavy traffic
- Close some roads on campus to thru-traffic, reducing the interaction of pedestrians and vehicle traffic within the campus residential core. Roads to be closed are Maywood, North Road, West Road, and the portion of Ellis Avenue north of Maywood, allowing safer walkways for residents in new dormitories on campus. This recommendation is in line with the five-year Master Plan.
- The campus Master Plan calls for a pedestrian bridge over Stadium Road from what is currently the Gage Parking lot to an academic building to be built over the sunken pay-lot. For safety reasons, this project should be expedited.
- A tunnel under Stadium Road should be constructed at the intersection of Warren Street to eliminate the conflict between auto traffic and pedestrians. For safety reasons, this project should be expedited.

GOAL 2: Enhance campus unity by creating a sense of place for University students and staff.

Non-motorized accessibility on campus is incomplete, crumbling in places, and lacks the aesthetic appeal that creates a sense of place. Streetscaping elements include pedestrian scaled lighting, decorative pavers, landscaping, seating, and trash receptacles. Two major areas lacking in streetscaping are the Arboretum and the parking lots. These areas of campus feel dark, desolate, and unsafe at night. Streetscaping elements can also serve the purpose of place making. The Sustainability Council should establish campus landscaping/streetscaping design standards to address the above strategies and continue their implementation and evolution throughout the campus.

OBJECTIVE: Incorporate streetscaping elements on campus.



Figure 10: Specifically designed pedestrian scale streetlight at Bethany Lutheran College.

STRATEGY:

- Design a campus specific, pedestrian scale streetlight and place along sidewalks, paths, and trails. An example of this can be seen at Bethany Lutheran College where they have integrated their own pedestrian scale streetlight design. The unique streetlight design gives pedestrians a sense of arrival when entering Bethany’s campus [SEE FIGURE 10].

OBJECTIVE: Add landscaping design elements to create a sense of place.

STRATEGIES:

- Replace crumbling sidewalks in the Arboretum with concrete sidewalks that integrate stenciled patterns unique to the campus. Repeat throughout the campus as sidewalk replacement becomes necessary. [SEE FIGURE 11]
- Landscape the northwest corner of the parking lots to mirror the adjacent corner southeast of the Taylor Center. This will also protect unpaved areas from foot traffic, which digs ruts several inches deep, creating tripping hazards [SEE FIGURE 12].

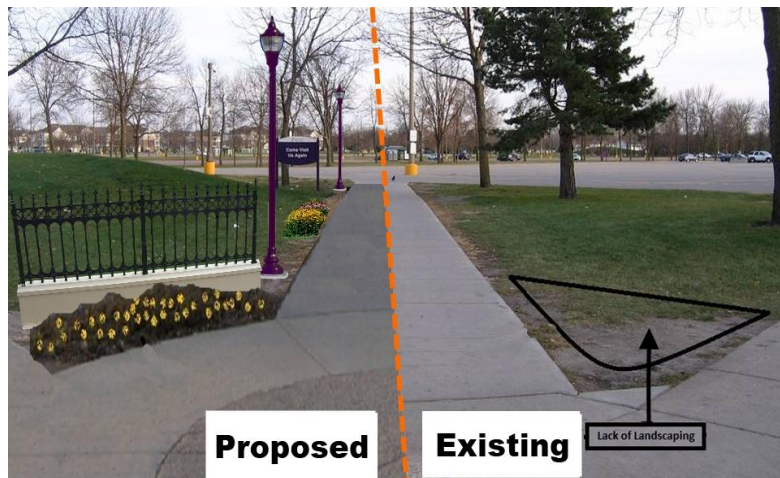


Figure 11: Arboretum pathway, lacking landscaping.

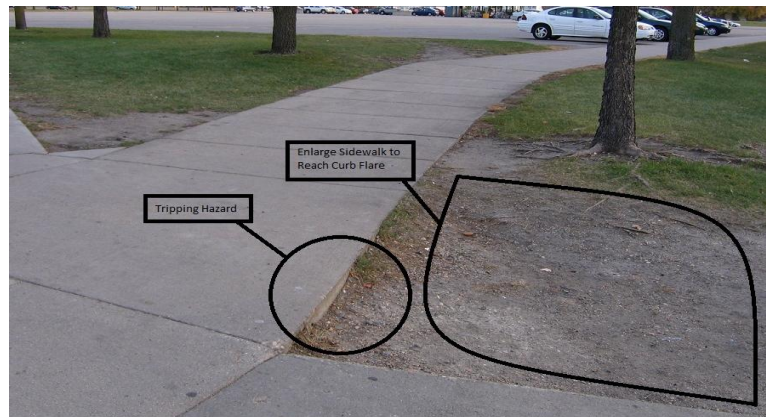


Figure 12: Tripping hazards, and lack of landscaping near sidewalks.

GOAL 3: Increase Transit ridership amongst students and staff.

According to the MATAPS study, about 93% of respondents living around campus do not use transit to access off-campus employment. Similarly, 85% never use transit for shopping and entertainment trips. The study indicated that the highest potential to increase transit ridership would be an extension of bus service into earlier morning and later evening hours. This allows students and faculty traveling to and from campus greater options in planning their transportation needs. Other studies have shown large increases in transit ridership due to changes in the way universities subsidize transit accessibility for students. Saint Cloud State University, for example, increased student fees to fund an unlimited access transit pass that allows students to ride the Saint Cloud Metro Transit system for free.

OBJECTIVE: Increase access to transportation options for staff and students.

STRATEGY:

- Increase student fees so that all University students have unlimited access to the Mankato Transit System. This would allow students to board any city bus by showing their MavCard. It is expected that the unlimited student access to the bus network across the city would increase ridership by 50% in the first year and by 2% per year thereafter.

OBJECTIVE: Work in conjunction with Mankato Transit to increase efficiency for University staff and students.

STRATEGIES:

- Extend bus service hours of the Stomper Express. Currently, because of inadequate financing from the University and the City of Mankato, this route is limited to three evenings each week.
- Create a Bus Rapid Transit hub on campus. MATAPS has called for the creation of express bus routes throughout Mankato/North Mankato between major employment, educational, and shopping centers. One such transit hub would be located on campus and connect with the Downtown, South Central College, and the River Hills Mall hubs. [SEE APPENDIX B]

GOAL 4: Reduce parking demand on campus.

By decreasing the demand for parking on campus, the University will increase non-motorized accessibility and pedestrian safety, raise transit ridership, and create a more aesthetically pleasing space, while decreasing the cost of parking lot maintenance on campus

OBJECTIVE: Promote alternative modes of transportation other than single occupancy vehicles.

Alternative modes of transportation include public transportation, walking, biking, and carpooling/ride sharing.

SHORT-TERM STRATEGY:

- Create an online carpool matching system on the University web page. This would allow users to create an account as either a driver or passenger. Account holders would enter routes, and travel times; the system would then compile a list of possible matches. This is similar to “Share the Ride” in Phoenix, Arizona for students to get to and from campus during the week both for local residents and for long distance commuters.

LONG-TERM STRATEGIES:

- Establish an offsite park’n’ride at the River Hills Mall to reduce parking on campus property. The University could lease underused parking spaces at the mall, benefitting both the University and River Hills Mall. This would be coordinated with Bus Rapid Transit routes and the proposed unlimited student bus
- Increase parking permit fees to mirror other campuses within MnSCU. New revenue can be used for parking lot improvements such as rain gardens and green space enhancements, and to cover the costs of the park’n’ride facility.
- Eliminate Lot 23, the Free Lot, and replace with “Orange” parking.
- Shift the other parking fees down to leave the current Lots 20 and 20a open for future academic or commercial development [SEE FIGURE 13]

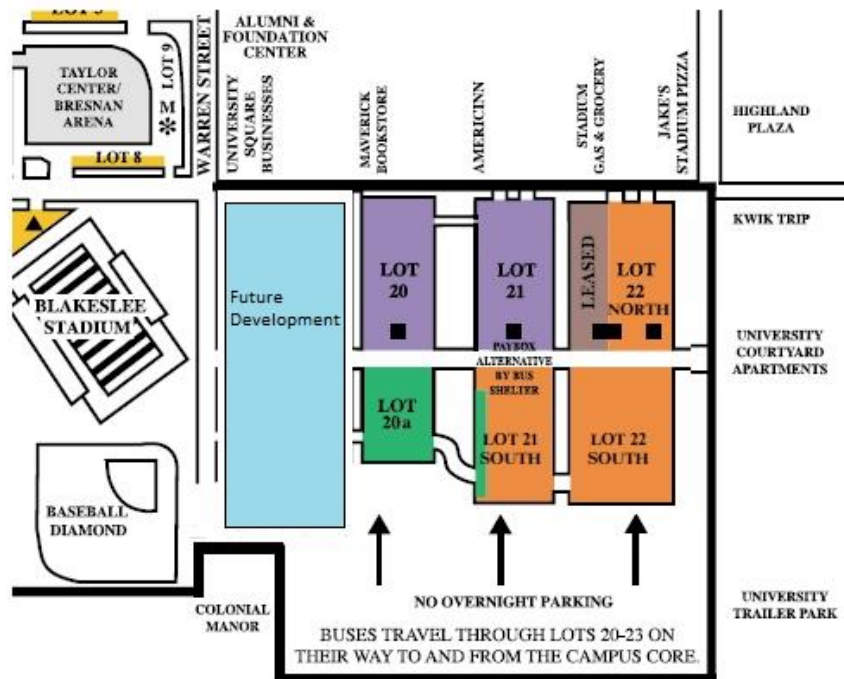


Figure 13: Proposed future changes and development in parking lots.

3.4 GREEN CAMPUS

3.4.1 Current Practices

In recent decades, advancements have been made in the preservation of environmental quality by altering the ways the in which humans handle natural processes. Minnesota State University, Mankato has largely ignored the environmental advancements regarding storm water treatment. Traditional methods that serve the campus pump storm water runoff into several retention ponds scattered across campus. Any runoff that is not captured enters the storm water drainage system, which carries the water directly into the Minnesota River.

Opportunities exist regarding on-site storm water management in the form of rain gardens, bio-swales, and permeable pavement. Minnesota State University, Mankato currently relies on several retention ponds to collect the runoff from the parking lots and paved surfaces throughout the campus.

New buildings and construction on the University campus have largely ignored the use of green roofs, electing instead for traditional roofs that further exacerbate water runoff issues and also are inefficient regarding energy use.

The impact trees have on our campus is tremendous and although we can quantify some of their benefits, we cannot always quantify the social and psychological advantages they offer. The campus does not identify trees as infrastructure. The grounds and landscaping crew do not look to shade buildings with the placement of trees, nor do they take into consideration the species or size of canopy when choosing trees. In addition, the grounds crew and landscaping are not fully utilizing the saturation power that trees (especially native trees) have regarding runoff and onsite storm water management.

On the University campus native grasses, plants, and trees have been ignored and instead non-native flowering plants and trees are preferred. These are not able to process water runoff like native varieties. They also endanger the ecosystem on campus, as they are more susceptible to foreign invaders and harmful diseases. According to University Environmental Health and Safety Management, the lack of native plants is mainly because there has been no desire voiced by students or faculty. As students become more aware of sustainability practices, stronger opinions would be formed, causing these types of changes on campus.

3.4.2 Long Term Vision

The first issue regarding storm water runoff should be the implementation of onsite water management features such as permeable pavement and rain gardens. Combined with retention ponds, they augment the Universities ability to manage runoff on campus. These features greatly reduce the contaminants entering the watershed and minimize erosion and flooding occurring downhill from campus following major rainstorms. The upkeep necessary on the piped runoff system would be reduced allowing those funds to serve new purposes focusing on sustainability.

To conserve energy, MnSCU and the collective schools should create a blueprint for green roofs. This will allow for schools to construct green roofs that reduce runoff and also save on heating and cooling costs. This would have a large impact on University energy consumption, since 80% of energy use is from buildings, and they lose most energy from the roof and the windows.

Trees need to be viewed as infrastructure. They are able to shade buildings in the summer, reducing the cooling costs, and create a sheltering effect from the elements in the winter months. They also serve as valuable storm water management tools as they are able to absorb water at astounding rates. The influx of trees on campus will also reduce the amount of CO2 released by the campus.

On the same note, native grasses, plants, and trees are also much more efficient in absorbing storm water and also in filtering out the contaminants before the water reaches its final destination. It is more beneficial for the species on campus to be native as they are able to process more and also are less susceptible to disease and foreign invaders.

3.4.3 Goals, Objectives, and Strategies:

GOAL 1: Establish guidance on green roofs.

Green roofs, also known as vegetated roofs, eco roofs, or nature roofs, are structural components that capture, filter, and detain rainfall [SEE FIGURE 14].

Vegetated roofs can be constructed over any type of roofing material, providing that the roof itself can handle the weight of the vegetation. They help reduce the

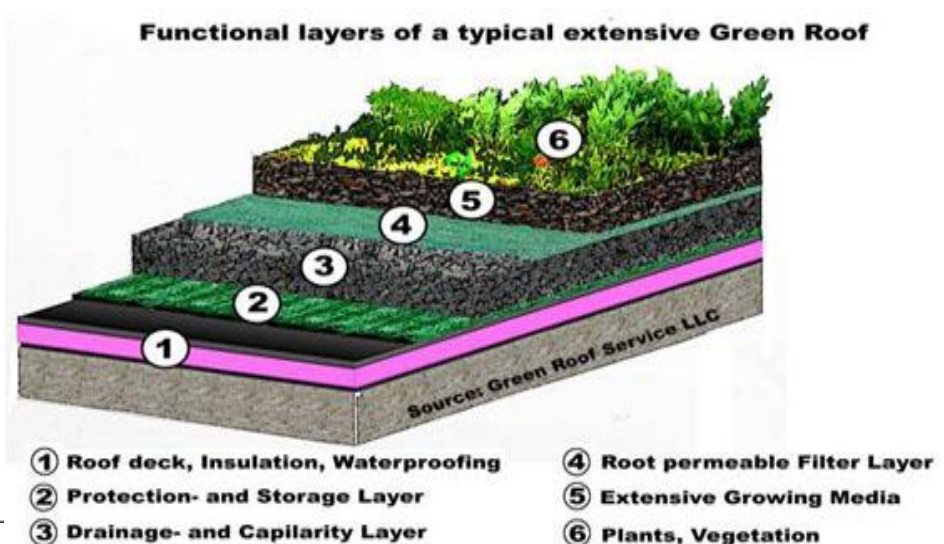


Figure 14: The layers of a green roof.

volume of runoff as well as the amount of pollution entering local drainage systems and receiving waters. In addition, adding vegetation to a roof will provide protection from ultraviolet radiation and extreme temperature fluctuations, two elements that cause standard roof membranes to deteriorate, and also reduce urban heat island effects. The addition of green roofs on campus will reduce storm water runoff, peak discharge rate, pollutant loading, runoff temperature, building energy use, urban heat index, and enhance site aesthetics.

OBJECTIVE: Reduce carbon emissions while promoting energy efficiency.

Green roof systems help keep the top floor of a building cooler by reducing the rooftop temperature during hot months, while the plants and soil insulate the building from sub-zero temperatures and icy winds in the winter.

STRATEGIES:

- Increase temperature stability using green roofs. Green roofs offer buildings better insulation, which will lead to a reduced need for heating during the winter months.
- Utilize green roofs to decrease the effect of the urban heat island, the tendency of urban environments to be warmer than surrounding areas because of land modification and greater energy usage.
- Naturally extend the life of the waterproofing membrane on roofs by protecting it from UV light and extreme temperature swings using green roof plantings.

OBJECTIVE: Protect and enhance our ecosystem and environment.

In addition to reducing building heating and cooling costs, green roofs can contribute to the ecosystem on campus.

STRATEGIES:

- Provide a habitat for a number of insect and bird species through the usage of green roofs, increasing urban biodiversity and creating a healthier ecosystem on campus.
- Utilize the runoff of buildings to plant landscaping features that beautify the University. In addition to the water absorbed by the rooftop soil, some of the excess water that runs off the roof can be collected and reused to sustain the surrounding landscaping.

OBJECTIVE: Utilize green roofs, rain gardens, and other sustainable landscaping features to educate University students on the effect it has on the environment.

This could be incorporated into existing courses in the Biology, Environmental Science, and Urban Studies departments, or could be used as a basis for new courses on sustainability. In addition, it could be used by students and faculty to complete individual research.

STRATEGIES:

- The proposed Minnesota State University, Mankato residence halls provide a unique opportunity to educate students in environmental issues while they contribute to the University's sustainability initiatives. This program can also help provide solutions to pressing environmental concerns.
- Install a water-collecting instrument and sensors to measure the heat flux, soil moisture, and temperature to collect data on how efficiently the green roof is reducing heat being held by the building and how efficiently it is absorbing and using water.
- Establish a course/research that focuses on environmental challenges and sustainable solutions related to interrelationships between constructed and natural processes, including the advantages of green roofs.
- This opportunity could also allow Environmental Science students to participate in school sponsored research on the nitrate and phosphate levels in standing water around the campus.

GOAL 2: Utilize more species native to Southern Minnesota.

The campus should utilize grass, plants and trees that are native to the area. This change to the landscaping will allow for a higher rate of storm water absorption, require less water to maintain, and is less susceptible to disease and invasive pests.

OBJECTIVE: Reduce campus-wide storm water runoff.

STRATEGIES:

- For all new buildings completed, assess storm water runoff and address through zero-scaping, rain gardens, bioswales, and/or green roofs.
- For all new and existing parking lots, reduce runoff through rain gardens and bioswales in the lot- possibly removing the curb in doing so.
- Utilize plants native to Minnesota inside of rain gardens for faster absorption of storm water.
- Have Sustainability Council require runoff estimates for all new construction and also on site management of said runoff.

- Sustainability Council must test all of campus for changes in storm water runoff and addressing weaknesses with rain gardens, bioswales, zero-scaping, and/or green roofs.

OBJECTIVE: Reduce watering costs and maintenance hours.

STRATEGIES:

- Strictly plant native grass, plants, and trees in new or re-landscaped areas.
- Use additional maintenance hours in the removal of leaves from gutters, rooftops, etc. due to the closer proximity to buildings through the use of trees as infrastructure.

OBJECTIVE: Reduce the risk of disease/ foreign invaders through the use of native species.

STRATEGIES:

- Only plant species native to Southern Minnesota to fend off exotic diseases and invaders.
- Plant a diversity of native species to maximize survival rate.
- With savings, contribute to University Green Fund, mentioned in Engagement section.

GOAL 3: Establish guidance on locating, planting, and caring for trees within the campus infrastructure to ensure long-term viability while maximizing tree benefits.

Campus planners should utilize and treat trees as infrastructure on campus to protect the environment and promote sustainability by conserving energy, water, materials, climate mitigation, and other resources.

OBJECTIVE: Establish a Campus Tree Development Plan.

The University should incorporate sustainability and campus trees at the start of all campus development and redevelopments by outlining integrated design approaches.

STRATEGIES:

- Sustainability committee should issue a statement indicating the campus' overall tree sustainability goals, and the expected outcomes from addressing the goals set forth.
- List all relevant polices affecting campus trees and how compliance will be met.

- Indicate how existing trees of considerable size, significance, heritage status, and cultural importance are to be preserved and protected by incorporating them into project site design.
- Identify which members of the University staff are responsible for implementing such green features into the development of campus.
- Sustainability committee will provide a description of follow-up measures to be taken through the completion of design and construction to ensure Tree Development Plan measures are being implemented and correctly installed to maximize function.
- Allocate funds to manage and ensure the trees' care during the establishment phase of two years.
- Create a cost/benefit analysis weighing the benefits of urban trees against the level of acceptable risks associated with placement of planted trees.

OBJECTIVE: Reduce the heat island effect on campus.

Shade trees along streets and within parking lots can be used to reduce pavement deterioration and maintenance costs. Energy savings will be realized as tree shade is provided during the middle of the day when energy costs are at their peak. This energy savings can be quantified using iTree's STRATUM software.

STRATEGIES:

- Use large canopy deciduous trees to shade streets, sidewalks, and parking lots in areas of new campus development in accordance to the Campus Tree Development Plan.
- Be selective when considering tree types; utilize a species that maximizes the reduction of carbon dioxide, provides significant transpiration, and provides shade to minimize energy use.
- Use light colored materials for sidewalk and road construction with a minimal reflective index to coincide with strategic tree placement.
- Provide shaded walking paths through parking lots via trees.
- Replace asphalt surfaces with non-conventional permeable surfaces to reduce the amount of heat reflected and retained by conventional surfaces
[SEE FIGURE 15].

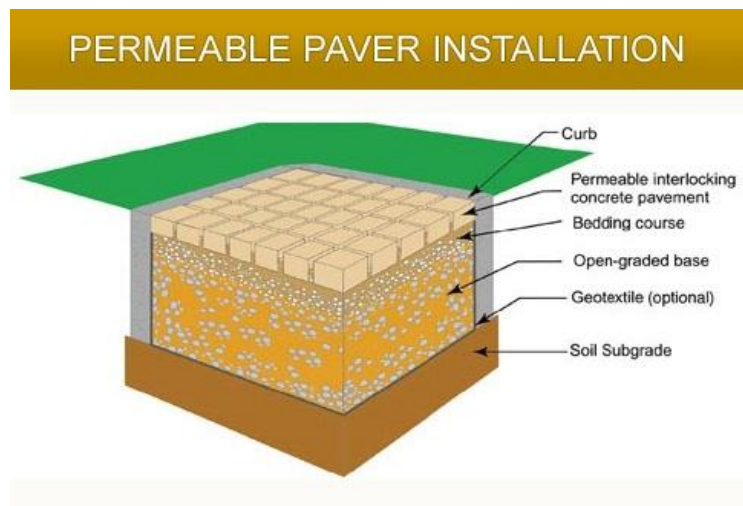


Figure 15: Permeable pavers suggested for landscaping on campus

OBJECTIVE: Manage storm water runoff in a more sustainable manner.

Maximize storm water runoff captured and diverted through trees which act as a vertical rainwater garden by runoff being intercepted by the trees' canopy, drawn up through its roots, and transpired through its leaves

STRATEGIES:

- Incorporate trees as infrastructure near retention ponds and bio swales to enhance their effectiveness in treating storm water runoff.
- Prioritize areas that require pervious paving; including immediately above roots, adjacent non-road uses, adjacent roofs, and adjacent roads.
- Use permeable surface materials in 50% or more of pavements on campus and immediately around each tree for optimal soil infiltration.
- Integrate tree planting into the storm water management plan to provide storm water runoff infiltration/filtration and aesthetic benefits.
- Design median plantings that divert and collect storm water, through the use of curb cuts, or other design principles.
- Where high winter salt use occurs, ensure trees are salt tolerant.

OBJECTIVE: Maximize trees' air quality benefits.

Pollution tolerant trees in polluted or heavily traveled areas can be used to improve the air quality of the University. Trees store and remove carbon from the atmosphere, helping mitigate climate change. The amount of carbon sequestered by new tissue growth is increased with healthier trees and larger diameter trees. Strategically located large stature trees provide more benefits over a long period of time, and are more cost effective, when compared to small-stature and medium-stature trees.

STRATEGIES:

- Consider using drought tolerant or low-water consuming species with water needs to match available storm water runoff.
- Promote species biodiversity and avoid species considered to be invasive and pest resistant.
- Choose trees with sun requirements appropriate for the location.
- Consider tree canopy shades to match site conditions for wider to smaller streets, consideration of wireless and utility interference, and conflict with solar collectors.

GOAL 4: Increase the amount of landscaped parking lots on campus.

By utilizing landscaping features, parking lots do not have to be ugly and barren. Also, by implementing sustainable landscaping features, the University can reduce the impact that parking lots have on the environment.

OBJECTIVE: Create an aesthetically pleasing parking lot design.

Use an innovative parking lot design that promotes pedestrian usage through the use sustainable landscaping practices. This will allow easy access for bicyclists and pedestrians, contributing to a more walkable campus.

STRATEGIES:

- Adhere to a campus Tree Development Plan to ensure a logical variety and maximum amount of trees in parking lots.
- Incorporate flower beds, rain gardens, and bio swales planted with native plants and grasses into the parking lot design.
- Landscape all new parking lots in accordance with established standards of the Minnesota Environmental Quality Board [SEE APPENDIX A].
- Retrofit the Stadium Road lots (20, 20a, 21, 22, and 23, plus expansion) as recommended by the 20-Year Master Plan. To combat funding constraints, utilize excess parking funds to first reconstruct Lot 20, with work to begin nearest the intersection to promote the project as a visible demonstration.
- Use native plants and landscaping elements to “direct” pedestrians through the parking lot.
- Incorporate bicycle racks into landscape elements.

OBJECTIVE: Reduce total amount of parking lot runoff.

STRATEGIES:

- Increase the total square footage of rain gardens within parking lots.
- Require a pre-determined number of trees in accordance with established standards of the Minnesota Environmental Quality Board [SEE APPENDIX A]
- Provide additional landscape islands using plants native to Minnesota.
- Use permeable pavers for walkways through parking lots (ie. parking lots along Stadium Rd.).

3.5 Energy Efficiency

3.5.1 Current Practice

A key factor in the creation of a sustainable society is managing the use of our energy resources. In the United States, 77% of electricity is consumed by the building sector. Since most of our CO₂ emissions come from coal, it is necessary to focus on reducing their consumption. Similarly, in Minnesota State Mankato, the major consumers of energy on campus are the facilities themselves. One of the largest ways the Minnesota State Mankato campus impacts its surrounding environment is through its consumption of energy. Any plan dealing with the campus' long-term sustainability must take stock of the current usage of energy and attempt to make recommendations for how the campus' energy needs could be met in a more efficient way.

Currently Minnesota State Mankato is engaged in several planning initiatives designed to limit energy consumption and increase energy efficiency. For new construction and renovations, Minnesota State Mankato is following the B3 (Buildings, Benchmark and Beyond) Sustainable Guideline which is required under the [Minnesota Sustainable Building Guideline](#). B3's main intent for buildings built before 2030 is to reduce annual energy costs by at least 30%, as required by the Minnesota Legislature. Energy use reduction also results in lower greenhouse gas and other emissions from fossil fuel energy production. Following B3's guideline will result in buildings which are at least LEED (Leadership Energy and Environmental Design) certifiable.

Additionally, Minnesota State Mankato is currently conducting a program through PBEEP (Public Building Enhanced Energy Efficiency Program) which evaluates the energy efficiency of campus buildings. The goal of this program is to identify the projects and renovations which offer the best cost/benefit ratio to the university.

The University is currently getting its power supply from Xcel Energy and natural gas supply from Center Point. While Xcel does get some of its power from renewable sources such as wind, its primary means of electricity production are traditional coal burning power plants. At this time there is very little being done to examine the possibilities of the campus generating some of its own power. The University has a very favorable arrangement with Xcel Energy, and the power is inexpensive to maintain, therefore there is little incentive to develop its own source of power. Additionally, while other campuses in Minnesota, notably the University of Minnesota, Morris, have had great success in installing wind turbines, studies have shown that the geographic conditions of the Minnesota State Mankato campus do not lend themselves to efficient power generation via wind. However, the campus still is a viable site for solar

generation via photovoltaic cells as well as geothermal energy, two options that have traditionally been passed over due to the long payback time on their investments.

3.5.2 Long Term Vision

Due to the long-term negative impacts of climate change, action is needed to curb harmful emission and reduce energy consumption. Recognizing that changes need to be made beyond the individual level, Minnesota State Mankato should establish itself as a leader in energy efficiency and conservation. Doing so will not only lessen the University's adverse impact on the environment, but will lead the school to embrace sustainability as a new paradigm that will drive the future growth of the institution and create a new generation of environmentally conscious students.

The University, through its commitment to a new culture of sustainability, will seek to maximize energy efficiency by implementing nationally recognized conservation, education, and renewable energy initiatives.

3.5.3 Goals, Objectives, and Strategies

GOAL 1: Reduce the impact Minnesota State Mankato facilities have on the environment.

Given the large number of students, faculty, and staff that frequent the University campus, as well as the facilities and infrastructure that have been built to support them, it is unavoidable that the campus will disrupt the natural ecological cycles of its site. The energy used by campus facilities for educational purposes and by students and staff mainly comes from nonrenewable resources. This adversely impacts the climate by increasing greenhouse gas emissions.

OBJECTIVE: Reduce greenhouse gas emissions from current campus facilities.

SHORT-TERM STRATEGIES:

- Conduct a carbon baseline assessment of campus and update it yearly. To successfully address campus greenhouse gas emissions, the University should conduct a comprehensive assessment to determine where emissions are coming from. This assessment should include campus facilities, transportation impacts, as well as waste production.
- Conduct a review of current energy efficiency of campus buildings, with the goal of identifying potential projects that offer the highest cost/benefit ratio. Many older buildings can offer significant energy savings at a marginal cost and can provide a significant return on investment. Identifying these priority projects is a critical first step to increasing campus energy efficiency.

LONG-TERM STRATEGIES:

- Aggressively renovate existing buildings to higher efficiency standards. After identifying the easiest targets for renovation, a long-term campus strategy of maximizing the energy efficiency of all campus buildings should be put in place.
- Facilities management should conduct a yearly review of campus energy efficiency and present it to the Sustainability Committee. Part of the report will include examinations of best practices in sustainable campus energy and how these could be integrated into Minnesota State Mankato. By making a yearly report on efficiency and sustainability required by facilities management it will ensure these issues are being actively monitored by key decision makers.

OBJECTIVE: Ensure future building projects on campus are built with sustainable energy use in mind.

Because it is less costly to install sustainable features at the construction of a building than it is to retrofit an existing building, it makes economic sense to hold future campus construction to high sustainability standards.

SHORT-TERM STRATEGIES:

- Require all bids on future building projects to make sustainability and energy efficiency a cornerstone of their proposal.
- Require all new buildings to be built to achieve 40% greater than code energy efficiency. The current B3 standards mandate 30% greater than code. By voluntarily going above this requirement, Minnesota State Mankato will establish itself as a national leader in campus energy efficiency.

LONG-TERM STRATEGIES:

- Require all future residence halls to compost organic material from food services.
- Prioritize sustainable renovations and projects in bonding requests to the legislature. Future bonding requests to the legislature should focus on renovating Minnesota State Mankato into a green “Campus of the Future.” This will provide additional funds that can be used to focus on energy conservation and efficiency

GOAL 2: Reduce the amount of non-renewable energy Minnesota State Mankato uses.

While it is certainly important to decrease the energy needed to power campus facilities, it is just as important to conserve the energy that the population of campus uses as well as examine options for energy self-sufficiency.

OBJECTIVE: Increase awareness of energy use on campus.

As the students and faculty become aware of sustainable practices, there will likely be subtle changes in behavior to help reduce the effect that our campus has on the environment.

SHORT-TERM STRATEGIES:

- Offer energy use monitoring devices for checkout at library. A variety of devices are currently on the market that can be plugged into consumer electronics and provide real time data about energy use.
- Conduct residence hall education campaigns on energy use. This should be in conjunction with “Engagements” campaign, featuring a monthly topic on sustainability to reduce the effect of overexposure to the students.
- Examine feasibility of installing energy monitoring terminals in residence halls.

LONG-TERM STRATEGIES:

- Create a taskforce to examine the feasibility of a paperless campus.
- Host an annual campus “Green Day” conference in coordination with Campus Green Month, in September. This is a one-day community-wide conference hosted on campus with speakers discussing environmental issues.

OBJECTIVE: Increase the amount of renewable energy generated on the University campus.

STRATEGIES:

- Mandate that all new buildings constructed on campus must generate 5% percent of their own power.
- Facilities management should conduct a yearly review of advances in small scale energy generation and present it to senior administration.
- Integrate solar renovations of campus facilities into future bonding requests beginning with the Taylor Center [SEE **FIGURE 16**]



Figure 16: Proposed solar panels, added to the Taylor Center

4.0 MONITORING AND REPORTING

4.1 MONITORING

A database should be created to efficiently track sustainability projects and goals on campus. Each project should be tracked utilizing detailed tables, goals, and indicators for ease of reporting, tracking, and advertising campus sustainability practices.

4.2 REPORTING

The recommended Sustainability Council should meet with the campus planning committee to work on goals and to create a quarterly sustainability progress report. Council chairs will report on their respective subcommittees to the council at the end of each quarter. Quarterly progress reports should be added to the Campus Sustainability Plan as an attachment and posted on the University website.

In addition to the quarterly progress reports, each year an annual report should be prepared. This report will document the year's accomplishments and should be submitted to senior administration for review. The annual report should also be posted on the campus website.

APPENDIX A

Minnesota Environmental Quality Board: Landscaping and Screening

- A. **Overall composition and location of landscaped areas** shall complement the scale of the development and its surroundings. In general, larger, well placed contiguous planting areas shall be preferred to smaller, disconnected areas.
- B. **Street trees.** A total of one tree per 40 feet of street frontage, or fraction thereof, shall be required. Trees should preferably be located between the sidewalk and the curb, within a grass strip (boulevard) or tree wells. If placement of street trees within the right-of-way will interfere with utility lines, trees may be planted within the front yard setback adjacent to the sidewalk. Where street trees already exist (for example, infill lots in an existing neighborhood) any gaps shall be filled.
- C. **Lot interiors:** On nonresidential, multifamily and single-family attached lots, a minimum of 20 percent of the site not occupied by buildings shall be landscaped, to include:
1. A minimum of 1 tree per 5,000 square feet of lot covered by buildings, parking and other impervious surfaces. Trees used to landscape parking areas and required buffers may be applied toward this requirement.
 2. The remainder of the landscaped area shall be covered with turf grass, native grasses or other perennial flowering plants, vines, shrubs or trees.
- D. **Landscaped yards.** Where a landscaped yard is required by this Ordinance, the requirement may be satisfied by one of the following:
1. A minimum of one tree for each 500 square feet and one shrub for each 100 square feet, or fraction thereof.
 2. Shrubs, consisting of a minimum of one shrub for each 50 square feet or fraction thereof
 3. Trees, consisting of a minimum of one tree for each 200 square feet. The remainder of the landscaped yard shall be covered with turf grass, native grasses or other perennial flowering plants.
- E. **Required screening.** Where screening is required by this Ordinance, it shall be 6 feet in height, unless otherwise specified, except in required front yards where such screening shall be 3 feet in height. Required screening shall be at least 50 percent opaque throughout the year. Required screening shall be satisfied by one of the following:
1. A decorative fence
 2. A masonry wall

3. A hedge
4. A decorative fence not less than 50 percent opaque behind a continuous landscaped area.
5. A combination of the above standards

F. Parking area landscaping and screening.

1. All parking and loading areas (including drive-through facilities, pump island service areas and stacking spaces) fronting public streets or sidewalks, and all parking and loading areas abutting residential districts or uses, shall provide:
 - A landscaped yard at least 5 feet wide along the public street or sidewalk. If a parking area contains over 200 spaces, the minimum required yard shall be increased to 8 feet in width.
 - Screening consisting of either a masonry wall, fence, berm or hedge or combination that forms a screen 3 feet in height and not less than 50 percent opaque.
 - One tree shall be provided for each 25 linear feet of parking lot frontage.
2. All parking areas and driveways shall be defined by a continuous concrete curb or wheel stops positioned 2 feet from the boundary of the parking area. The 2 feet between the curb face and the parking area boundary shall not be landscaped with plant material, but instead shall be paved or covered with mulch or rock.
3. Interior landscaping. The corners of parking lots and all other areas not used for parking or vehicular circulation shall be landscaped with turf grass, native grasses or other perennial flowering plants, vines, shrubs or trees. Such spaces may include architectural features such as benches, kiosks or bicycle parking.
4. In parking lots containing more than 200 spaces, an additional landscaped area of at least 150 square feet shall be provided for each 25 spaces or fraction thereof, containing one canopy tree. The remainder shall be covered with turf grass, native grasses or other perennial flowering plants, vines or shrubs.

G. Materials. All plant materials must meet the minimum standards set by the American Association of Nurserymen. Landscape species shall be indigenous or proven adaptable to the climate, but shall not be invasive on native species. Plant materials shall comply with the following standards:

1. Minimum plant size shall be as specified in the following table. For the purpose of determining tree trunk size, the diameter shall be measured 6 inches above ground level.

Minimum Plant Size for Landscape Materials

Plant Type	Minimum Size
Trees: Evergreen Deciduous Deciduous ornamental	6 feet in height 2 ½ inches in diameter 1 ½ inches in diameter
Shrubs: Evergreen or deciduous	18 - 24” in height 18 - 24” in height

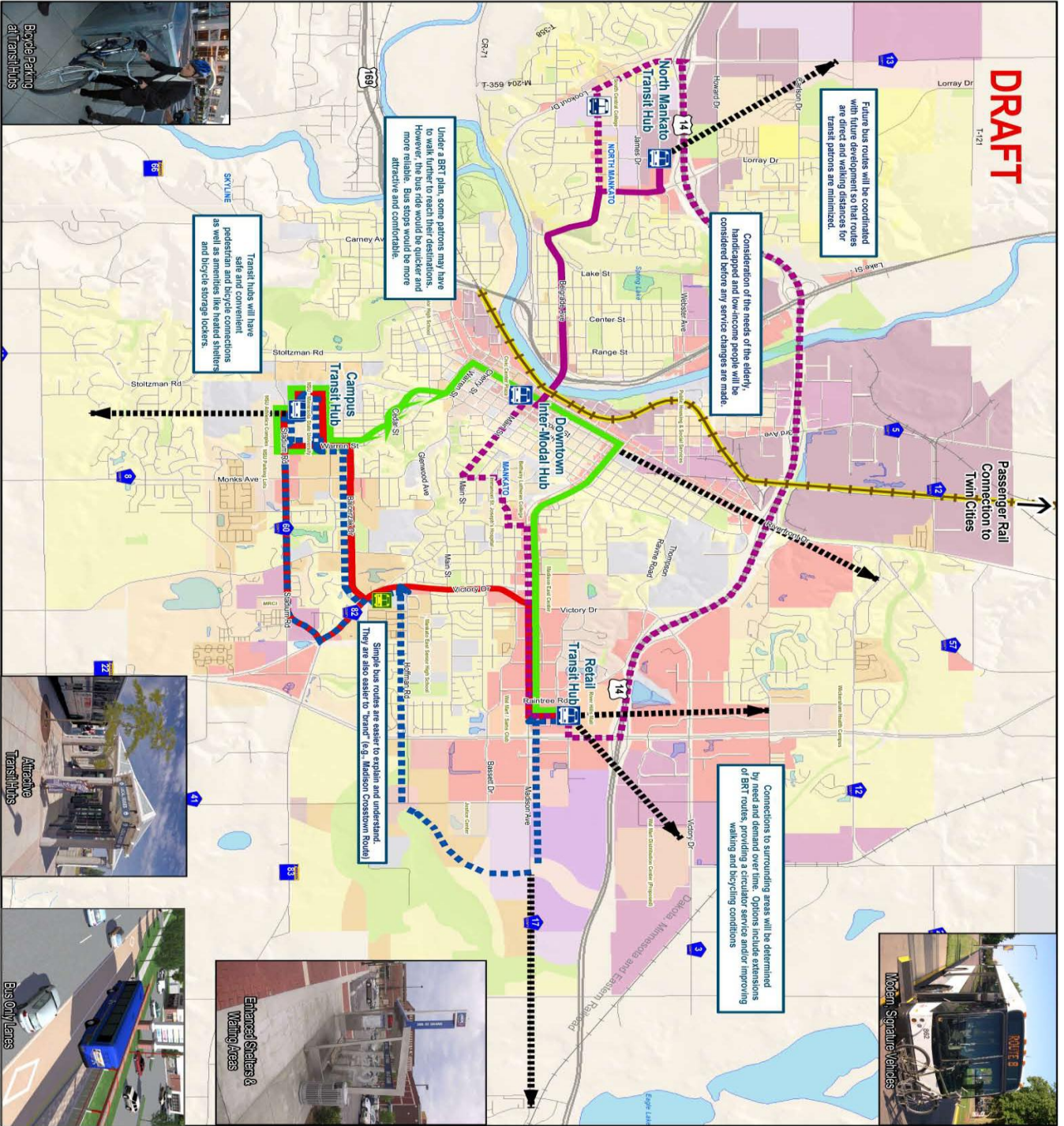
2. Landscape materials shall be tolerant of specific site conditions, including but not limited to heat, drought and salt.
3. Existing healthy plant material may be utilized to satisfy landscaping requirements, provided it meets the minimum plant size specified in the table above.
4. Landscape materials that are used for screening shall be of a size that allows growth to the desired height and opacity within 2 years.

H. Installation and maintenance.

1. Areas to be landscaped shall be prepared and improved as specified by current Minnesota Department of Transportation standards for soil preparation and drainage.
2. All landscape materials shall be installed to current industry standards.
3. Maintenance and replacement of landscape materials shall be the responsibility of the property owner, including the maintenance of any trees planted in the public right-of-way. An adequate water supply shall be provided. Landscape maintenance should incorporate environmentally sound management practices, including:
 - The use of water- and energy-efficient systems such as drip irrigation.
 - Pruning primarily for plant health and replacing dead materials annually.
 - Anticipating and allowing plant community succession.

APPENDIX B

MATAPS Proposed Bus Rapid Transit



Planned Land Use

- Low Density Residential
- Medium Density Residential
- High Density Residential
- Office Residential
- Office / High Rise Space
- Mixed Residential / Retail
- Neighborhood Commercial
- Commercial
- Central Business District
- Lightway Center Commercial
- Highway Commercial
- Mixed Office Commercial
- Office Industrial Campus
- Industrial Commercial
- Light Industrial
- Heavy Industrial
- Parks/Open Space
- Public-Semi Public
- Civic / Institutional

Legend

Future BRT Route Concepts

- Commuter/Developmental
- North Mankato
- North Mankato Alternative Route
- Commuter
- Mankato East
- Alternative Route

Future Transit Hubs

- Future Transit Hub
- Future Transit Hub
- Alternative Hub Location
- Maintenance Hub / Terminal
- Future Passenger Rail Link
- Connections from Hubs

Bus Rapid Transit (BRT) Concept Plan



7/20/10
Figure 5-2

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