



UNIVERSITY OF NEBRASKA MEDICAL CENTER AND NEBRASKA MEDICINE

SUSTAINABILITY MASTER PLAN, 2014–2023





The UNMC/NM Sustainability Master Plan was updated as of March, 2016. The energy, emissions, water, campus planning, and waste baselines were updated due to the availability of more accurate data and information.

Wait! Before you print this document...

This Sustainability Master Plan has been created with hyperlinked text for easy navigation while viewing in a PDF reader on a computer, tablet, or smart phone. Each page has a **navigation bar** at the bottom with clickable links to the Table of Contents, the main body of the Plan, and the start of the Appendix. The sections listed in the Table of Contents and at the start of the Appendix are also clickable text. Using these links, any section of the Plan can be reached within two clicks. This feature is added to eliminate the need for scrolling and to make the electronic version easier to use and navigate than a printed copy. Try it out!





Executive Summary

Introduction

The University of Nebraska Medical Center and Nebraska Medicine (referred to as UNMC/NM throughout this Executive Summary) have been building a strong foundation in sustainability over the past two decades as demonstrated by their campus-wide mixed recycling program, a significant reduction in recent energy consumption, and a campus culture that values sustainability. In a recent survey of UNMC/NM employees and students, over 90 percent of respondents indicated it is important to them that UNMC/NM are committed to sustainability and actively try to conserve energy and natural resources on campus. Similarly, approximately nine out of every ten respondents reported there is a connection between environmental stewardship and UNMC/NM's health-oriented missions.

This Sustainability Master Plan represents the next step for UNMC/NM in their continuous and integrated effort to consume fewer resources, even while expanding the campus, and to provide strategic direction across their operations over the next decade. It also represents the two organizations' ongoing commitment to work together toward common goals.

Mission Alignment

Sustainability entails protecting human and environmental health, and using resources wisely so as to provide for the future while meeting current needs. These concepts line up very well with

UNMC/NM's health-oriented missions, which focus on providing extraordinary patient care, health education, and research to serve Nebraska and the region. For example, by reducing electricity use on campus, UNMC/NM help decrease the amount of emissions and pollution produced by fossil-fueled power plants supplying the energy. This aids in reducing asthma attacks, chronic bronchitis, emergency room visits, and even premature death. Therefore, incorporating the principles of sustainability into what UNMC/NM do everyday will not only help accelerate their vision of becoming a world-renowned health sciences center, but it also demonstrates their commitment to improving community health.

Financial Opportunities

Sustainability also presents a tremendous opportunity for UNMC/NM to reduce long-term costs by conserving energy and resources. Many of UNMC/NM's peers in higher education and the health care industry have begun to seize this opportunity by adopting their own sustainability and climate action plans. The financial benefits are projected to be substantial. The Commonwealth Fund found that sustainability initiatives in the health care industry could save \$15 billion over the next ten years by implementing a package of relatively simple "interventions."

UNMC/NM have already seen notable financial savings by reducing energy use. If UNMC/NM achieve the goals in this plan, they could reduce annual costs related to water, trash hauling, and energy by \$1 million to \$3 million by 2023.

Sustainability is Vital

"Nebraska Medicine is proud to partner with UNMC on this vital path toward a more sustainable future. This joint endeavor will reap environmental, social, and financial benefits, and help us achieve our mission."

Bill Dinsmoor
Chief Executive Officer
Nebraska Medicine

"Our sustainability initiative with Nebraska Medicine is strongly connected to our collective, campus-wide focus on improving community health. By embracing the opportunities presented by sustainability, we will exemplify environmental stewardship, reduce costs, better serve the community, and demonstrate our commitment to being a world-renowned academic health sciences center."

Dr. Jeffrey Gold
Chancellor
University of Nebraska Medical Center

Methodology & Structure

This Plan reflects information collected primarily throughout fiscal years 2013 and 2014 from interviews, surveys, site visits, open houses, advisory team meetings, conversations, research, and analyses. It also incorporates content and baseline data from Nebraska Medicine's original Energy & Sustainability Master Plan, which was approved in the spring

of 2011. The collected information and data were used to establish joint baselines, goals, and strategic recommendations in eight key areas of UNMC/NM's operations:

- Emissions
- Energy
- Water
- Materials
- Transportation and Parking
- Food Services
- Campus Planning
- Campus Engagement

The Plan specifically focuses on UNMC/NM's operations at their main campus at 42nd & Dewey. Satellite clinics and other smaller campuses (e.g., Bellevue Medical Center) are not included. Despite this initial strategic focus, the Plan suggests expanding sustainability-related support and services to these areas in the future. Additionally, baselines and goals were not established for the areas of research and academics per UNMC/NM's preference to focus primarily on sustainable operations. However, long-term strategies are included that address incorporating sustainability into these areas.

The Plan also discusses UNMC/NM's peers in higher education and health care to highlight recent sustainability-related trends in these industries and the noted operational areas.

To provide context for the significance of sustainable operations, the connections between environmental health, community health, and the eight key operational areas are illustrated on the final page of this Executive Summary.

Goals

Each of the operational areas previously listed has one or more goals. If UNMC/NM are able to achieve the goals related to energy, water, and materials, they will significantly reduce annual expenses, decrease their environmental impact, and help improve community health.

See "Definitions" to the right for explanations of the acronyms used for the baseline metrics below.

Emissions

Reduce annual greenhouse gas emissions by 30 percent by the end of 2023 and achieve climate neutrality (zero net emissions) by 2050 (baseline: 154,793 metric tons per year of CO₂eq in calendar year 2010)

Energy: Buildings

Reduce annual building energy consumption by 25 percent by the end of 2015, and an additional 10 percent by the end of 2023 (baseline: 2,369,866 source MMBtu in calendar year 2010)

Energy: Electricity Demand

Reduce annual peak electricity demand by 25 percent by the end of 2015, and an additional 10 percent by the end of 2023 (baseline: 28,920 kW in August 2010)

Water Consumption

Reduce annual gallons of water consumed by 10 percent by the end of 2023 (baseline: 225,164,787 gallons per year as an annual average of calendar years 2010 and 2011)

Materials: All Outgoing Material

Reduce the total annual weight of outgoing material (waste and recycling) by 25 percent by the end of 2023 (baseline: 7.5 million pounds per year as an annual average of fiscal years 2011 and 2012)

Materials: Recycling

Increase the annual percent of materials diverted from the landfill to 35 percent by the end of 2023 (baseline: 22.9 percent as an annual average of fiscal years 2011 and 2012)

Transportation and Parking

Increase to 20 percent the percentage of commuting trips that occur by modes other than driving alone in a conventionally-fueled vehicle by the end of 2023 (baseline: 12.7 percent as of a March 2012 survey)

Food Services Waste

Divert at least 90 percent of kitchen and café waste from reaching a landfill by the end of 2023 (baseline: there is no specific baseline; achievement will be known when the goal is reached rather than relative to a given baseline value)

Campus Planning

Maintain the current density of 73,327 gross square feet (GSF) of built space per developed acre, which includes all UNMC/NM campus buildings and parking garages (baseline: 73,327 GSF of built space per developed acre as of December 2010)

Campus Community Engagement

Achieve a Sustainability Engagement Score of 75 by the end of 2023 (baseline: 45 per

Definitions

CO₂eq: refers to carbon dioxide equivalent, which is a metric that is commonly used to compare the emissions from various greenhouse gases regarding their global warming potential.

kW: A watt is a commonly used measure of electrical power consumption. kW equals one thousand watts.

MMBtu: Btu refers to a British Thermal Unit, which is a standard unit of energy that is commonly used when combining other units of energy (e.g., watts of electricity and therms of natural gas) to express total energy consumption. MMBtu equals one million Btu.



"I believe we have the responsibility of promoting the health of our communities and the natural environment, in addition to individual patients, since they are all interconnected."

- UNMC/NM Survey Respondent

combined results from surveys conducted in September 2012 and December 2012)

Top Recommendations

The strategies recommended in the Sustainability Master Plan were culled from ideas generated by multiple individuals from Nebraska Medicine, UNMC, and Sodexo, including staff, students, administrators, and faculty. In addition, strategies were identified by researching activities at other higher education institutions, health care organizations, businesses, and governmental agencies. The strategies in the Plan are those that will have the largest impact and are the most feasible. Given that the Plan's primary intent is to set a broad sustainability vision for UNMC/NM while including the most important and effective strategies that will help UNMC/NM achieve the vision, a detailed analysis, including a cost/benefit analysis of each strategy, was not performed. Such an analysis is an important next step in some cases.

The strategies are organized into actions that are achievable in the short term or long term. Of the short-term strategies included in the Plan, there are fourteen that present high-impact, high-return opportunities for UNMC/NM:

Sign the American College and University Presidents' Climate Commitment (ACUPCC)

By doing so, UNMC/NM will join over 680 other leading colleges and universities in working to combat climate change.

Optimize Equipment Operations

Optimizing building energy equipment operations to minimize the total amount of equipment online and to improve the operational sequence of the system is crucial to maximizing energy efficiency and ensuring the success of other major energy reduction efforts.

Standardize Building Controls

Completing the planned building control system upgrade will enable Facilities Management and Planning staff to monitor and adjust building systems in real time and dynamically respond to changing conditions inside and outside of buildings, thereby increasing efficiency.

Focus on Lighting

A campus-wide lighting audit and subsequent retrofit to increase the efficiency of lighting will reap quick savings. There are also abundant opportunities to save lighting energy through operational adjustments.

Implement IT-Related Energy Conservation Measures

A wide variety of strategies can be further explored and implemented related to Information Technology (IT) equipment. These strategies range from activating power management features on computers and other equipment to reducing the number of printers through networking and use of multi-function machines.

Install Low-Flow Water Fixtures

The majority of UNMC/NM's water consumption is for indoor domestic purposes. Installing appropriate low-flow fixtures across campus will decrease water use and mitigate expected water rate increases.

Implement Waste and Recycling Process Improvements

Expanding the number and uniformity of recycling receptacles across campus and improving recycling education for staff, students, and visitors will help dramatically reduce the amount of UNMC/NM waste that is routed to a landfill.

Develop a Transportation Plan and Implement TDM Programs

UNMC/NM's location in midtown Omaha presents unique challenges and opportunities. A Transportation Plan that integrates a vision for pedestrians, cyclists, transit users, and vehicles to efficiently travel to and through campus will help UNMC/NM capitalize on its location. Related transportation demand management (TDM) programs, such as subsidizing transit passes, will also help cost-effectively reduce parking demand.

Monitor Indoor Air Quality and Minimize Toxics in Buildings

Proactively testing indoor air quality in UNMC/NM buildings on a recurring basis and making necessary adjustments, as well as minimizing the introduction of harmful toxics via equipment and materials used in buildings, will help promote optimal work and clinical environments.

Establish an Office of Sustainability

Due to the complexity of coordinating multiple, simultaneous actions noted in this Plan, UNMC/NM would greatly benefit from establishing an Office of Sustainability and employing a full-time Sustainability Manager. This individual would represent both organizations and play an integral role in managing, supporting, and reporting on sustainability efforts.

Create an Executive Sustainability Council

With support from the Sustainability Manager, an executive-level sustainability steering committee with representatives from both organizations would help fully implement the Plan, set sustainability policy, and integrate sustainability into campus operations and decision-making. The committee would report to the UNMC Chancellor and executive leadership at Nebraska medicine.

Track and Communicate Progress

Regularly tracking the right data and measuring progress versus the stated goals are extremely important. Communicating progress to individuals across campus and the community, as well as noting the related financial, public health, and environmental benefits, helps keep everyone engaged. This includes adding sustainability activities and related public health benefits as part of Nebraska Medicine's annual community benefit report.

Integrate Sustainability into Strategic Planning

UNMC's current Strategic Plan includes an action item focused on developing a joint Sustainability Master Plan and generally commencing with implementation. Continuing to include sustainability and specifying implementation activities in subsequent versions of UNMC/NM's respective Strategic Plans would greatly benefit both organizations. Future Strategic Plans could include specific action items related to energy and water conservation, waste reduction, greenhouse gas emissions, and/or educating the public about community health benefits connected to sustainability.

Adopt a Sustainability Statement or Policy

Developing and adopting a joint, high-level sustainability statement or policy that provides a clear definition of sustainability and its connection to community health will make UNMC/NM's institutional commitment more transparent and help guide future sustainability activities in conjunction with this Plan.

Strategies Summary

This is a complete, albeit abbreviated, list of the short-term strategies recommended in the Plan. Top recommendations are in **bold**. For more detail, refer to the respective sections of the Plan or the Appendix.

Emissions

1. **Become an ACUPCC signatory**

2. Account for and reduce use of greenhouse gas- and chlorofluorocarbon-based refrigerants

Energy

3. Resolve building system temperature differentials
4. **Optimize equipment operations**
5. Integrate automation technologies for building systems
6. **Standardize building controls**
7. Install a flue gas economizer to capture and reuse waste heat
8. **Conduct a comprehensive lighting audit and upgrade**
9. Improve building envelopes
10. **Implement additional energy conservation measures related to information technology**
11. Include energy-related criteria when making purchasing decisions for electrical office and medical equipment
12. Improve UNMC/NM vehicle fleet efficiency

Water

13. **Specify low-flow and other efficient fixtures in any new buildings or renovations**
14. **Install low-flow faucet aerators that reduce the flow rate to 0.5 gallons per minute or less**
15. Track, monitor, and communicate water consumption on a more frequent and detailed basis
16. Create a Landscape Management Plan that incorporates water-wise strategies, policies, and techniques

"I would like to see [UNMC/NM] be a leader in sustainability."
- UNMC/NM Survey Respondent



“[UNMC/NM] should have an incentive program for people to bike, walk, and take public transportation to work.”

- UNMC/NM Survey Respondent

Materials

17. Implement paper reduction initiatives, such as default duplexing and modified printing quotas
18. Adopt sustainable procurement policies
19. **Implement trash and recycling process improvements, such as increasing recycling receptacles and education**
20. Reduce lab-related trash by moving toward more reusable or recyclable materials and providing education
21. Implement specific waste reduction strategies in the Surgical Services Department

Transportation and Parking

22. **Develop a Transportation Plan that integrates a vision for pedestrians, cyclists, public transit, and vehicles**
23. Improve the pedestrian experience by addressing dangerous pedestrian intersections and improving wayfinding
24. Promote and support transit use
25. Expand bicycling infrastructure such as trails, bike lanes, sharrows, bike parking, and cyclist showers
26. Provide flexible transportation programs, such as car-sharing and emergency-ride-home programs
27. Support sustainable vehicle use such as carpooling, fuel-efficient vehicle use, no-idling policies, and reduction of surface parking

Food Services

28. Focus on diversion of food waste into a more sustainable waste stream

29. Establish a Healthy and Sustainable Foods Task Force to zero in on additional healthier food options and waste reduction strategies
30. Eliminate Styrofoam from food service operations
31. Transition back to using more reusable dishes and flatware
32. Expand sustainable food education and promotional efforts
33. Sign Health Care Without Harm's Healthy Food in Health Care Pledge

Campus Planning

Follow these three principles when making campus planning decisions:

34. Foster a mix of building uses to improve area vibrancy
35. Use building placement and streetscape design to support active transportation options
36. Provide high-quality public spaces to encourage interaction and support healing

In addition:

37. Incorporate elements of this Plan into the Facilities Development Plan
38. Implement a de-construction approach to building removal
39. Improve the tree canopy
40. **Proactively monitor indoor air quality**
41. **Minimize toxics in buildings**

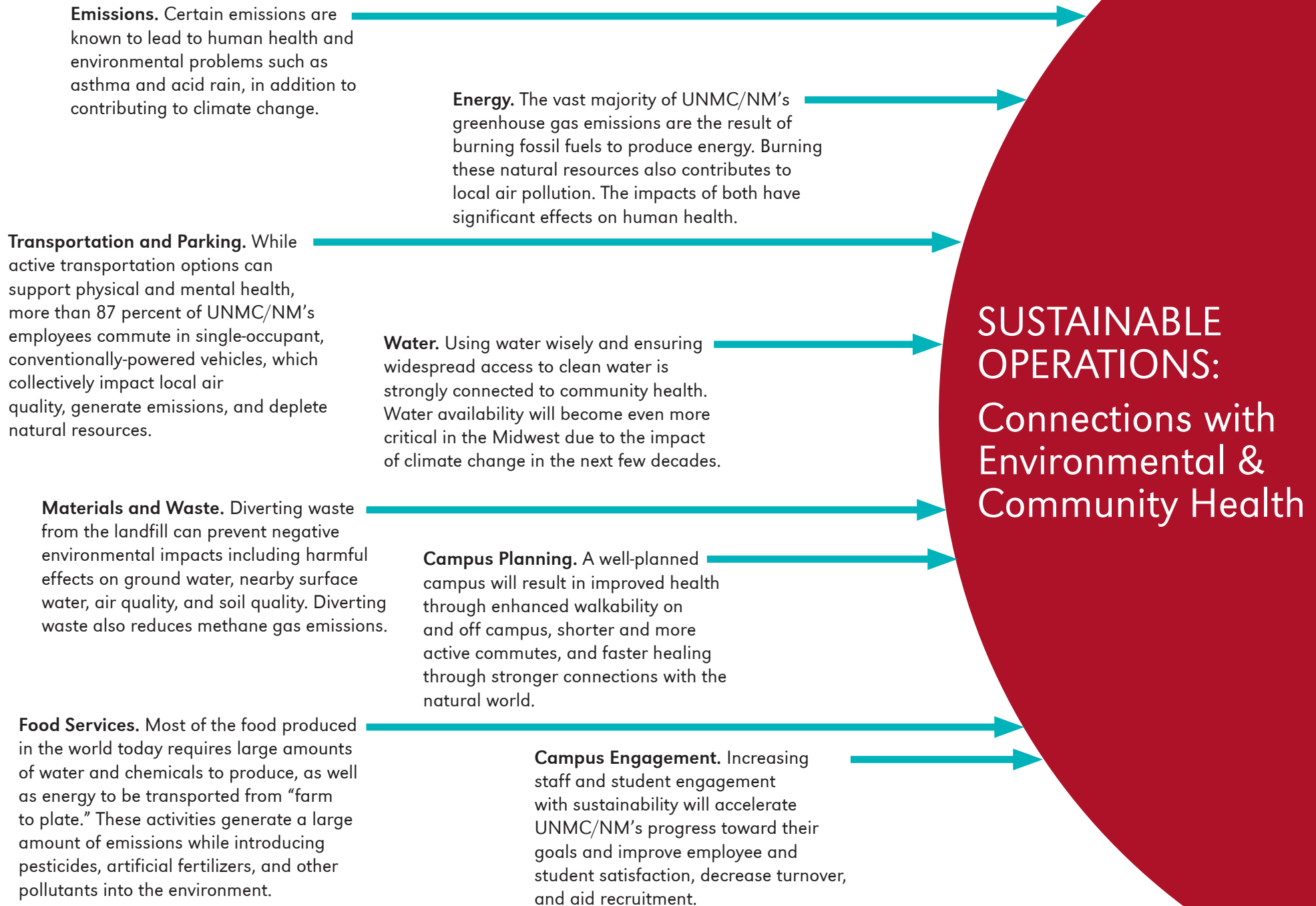
Campus Engagement

42. **Establish an Office of Sustainability and hire a Sustainability Manager**

43. **Create an executive-level sustainability steering committee representing both organizations**
44. **Track and communicate progress to employees and students**
45. **Continue to include and fully integrate sustainability into organizational strategic planning**
46. **Adopt a joint sustainability statement or policy**
47. Join Practice Greenhealth and the Association for the Advancement of Sustainability in Higher Education
48. Formalize and integrate the two green teams (Energy Advocates Team and UNMC LiveGreen)
49. Expand education and communication efforts
50. Provide recognition opportunities that are consistent and noteworthy
51. Incorporate sustainability into employment and training elements, such as job descriptions and orientations
52. Support satellite locations and organizational partners
53. Conduct community outreach regarding sustainability

Conclusion

This Plan builds on a foundation of past efforts by UNMC/NM to adopt sustainable practices in specific areas of their operations. Going forward, the Plan provides a road map to achieving a more comprehensive and strategic approach to sustainability consistent with UNMC/NM's commitment to improving the health of Nebraska.





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"I'm really pleased to know that I work for an organization that cares about the environment and is moving forward with sustainable options."

- UNMC/NM Survey Respondent

Introduction

Given the strong connection between sustainability and community health, the University of Nebraska Medical Center and Nebraska Medicine (referred to as UNMC/NM throughout this Plan) see reducing their environmental footprint as a strategic opportunity to achieve their integrated missions, which includes advancing their commitment to community health and improving the health of Nebraska.¹

While environmental and health benefits are key drivers of UNMC/NM's sustainability activities, there are multiple other benefits to be realized: happier and more engaged employees and students, an overall better campus environment, and decreased costs.

The fiscal case for sustainability in the health care industry is particularly strong. A 2012 report by the Commonwealth Fund found that if a relatively simple package of sustainable "interventions" were deployed in every hospital across the country, savings could exceed \$5.4 billion over five years and \$15 billion over ten years.²

The estimates on UNMC/NM's potential cost savings and avoided costs are also noteworthy. If UNMC/NM meet their goals by the end of 2023 for reducing energy, water, and waste, they have the potential to save:

- **Water:** \$50,000 annually
- **Trash Reduction:** \$35,000 annually
- **Energy:** \$1-\$3 million annually

UNMC/NM are not alone in their view that sustainability—meeting present needs without compromising the ability of future generations to meet their needs—is an opportunity.³ Sustainability programs and initiatives have been growing tremendously on higher education campuses and in the health care industry.

The UNMC/NM community is very supportive of an expanded sustainability initiative. In a recent survey of students and employees, over 90 percent of respondents indicated it is important to them that UNMC/NM are committed to sustainability and actively try to conserve energy and natural resources. Similarly, approximately nine out of every ten respondents reported there is a connection between environmental stewardship and UNMC/NM's health-oriented missions.

UNMC/NM's previous sustainability efforts are commendable. Various projects focusing on energy efficiency and waste reduction have especially demonstrated significant financial and environmental benefits. This Sustainability Master Plan leverages these past efforts and sets forth a clear vision for how UNMC/NM can take advantage of the opportunities sustainability presents. It charts a course for a sustainable future—economically, environmentally and socially—by spelling out specific goals and strategies that will help UNMC/NM achieve their community health-oriented missions.

Key Findings

The Planning Team identified five key findings. These concepts cut across specific areas of the Plan and broadly reflect

accomplishments by and opportunities for UNMC/NM. The overall key findings are:

- The continued success of sustainability at UNMC/NM will depend on the successful alignment of sustainability initiatives with the strategic mission of advancing community health.
- There has been significant and impressive success related to building energy efficiency and conservation.
- There is widespread support for expansion of UNMC/NM's sustainability efforts. Consequently, the campus would benefit from a formally-adopted, consistent definition of sustainability and an organizational statement that highlights UNMC/NM's commitment to sustainability and its connection to community health.
- The sustainability efforts at UNMC/NM could be better connected to one another and supported by a Sustainability Manager and an executive-level sustainability steering committee to ensure consistent and effective implementation.
- Several efforts have yielded very impressive results, but their connection to environmental impact and public health are often under-communicated.

Plan Overview

The Sustainability Master Plan is the result of interviews, surveys, site visits, open houses, advisory team meetings, conversations, research, and analyses

conducted primarily throughout fiscal years 2013 and 2014. It also represents an expansion of Nebraska Medicine's original Energy & Sustainability Master Plan adopted in April 2011 and the two organizations' ongoing commitment to work together toward common goals.

The collected information and data were used to establish critical baselines for key measurements of sustainable practices and informed the development of the Plan. The overall goal of the Plan is to strategically advance UNMC/NM's sustainability efforts over the next decade.

The Plan addresses several operational areas that each impact sustainability:

- Emissions
- Energy
- Materials
- Water
- Transportation and Parking
- Food Services
- Campus Planning
- Campus Engagement

For each area, the Plan provides a baseline performance metric or metrics, a goal for each metric, and recommended strategies that will help UNMC/NM achieve the goals.

The Plan specifically focuses on UNMC/NM's operations at their main campus at 42nd & Dewey. Satellite clinics and other smaller campuses (e.g., Bellevue Medical Center) are not included. Despite this initial strategic focus, the Plan suggests expanding sustainability-related support and services to these areas in the future. Additionally, baselines and goals were not established for the areas of

Sustainability Aligns with UNMC/NM's Missions and Visions

Taking advantage of sustainability-related opportunities acknowledges both the positive impact of sustainable health care operations on community health and the benefits of incorporating sustainable practices across both organizations. Doing so enhances and strengthens the alignment between UNMC/NM's goal to provide a positive working environment, its commitment to community health, and the sustainability of the natural environment. The alignment means that sustainable practices are a mechanism for achieving their organizational missions and visions.

UNMC

Mission: The mission of the University of Nebraska Medical Center is to improve the health of Nebraska through premier educational programs, innovative research, the highest quality patient care, and outreach to underserved populations.

Vision: The partnership of UNMC and Nebraska Medicine will be a world-renowned health sciences center that:

- Delivers state-of-the-art health care;
- Prepares the best-educated health professionals and scientists;
- Ranks among the leading research centers;
- Advances our historic commitment to community health;
- Embraces the richness of diversity to build unity;
- Creates economic growth in Nebraska.

NEBRASKA MEDICINE

Mission: Serious medicine. Extraordinary care.

Vision: To be the region's premier provider by serving our patients and community through extraordinary care, the finest people, and academic and private practice medicine.



"I believe we have the responsibility of promoting the health of our communities and the natural environment, in addition to individual patients, since they are all interconnected."

- UNMC/NM Survey Respondent

research and academics per UNMC/NM's preference to focus primarily on sustainable operations. However, long-term strategies are included that address incorporating sustainability into these areas.

While background information and strategies for each section are presented at a summary level in the Plan, the Appendix provides additional detail about the various strategies, UNMC/NM's past actions, and how each operational area can support UNMC/NM's sustainability initiative.

Sustainability at UNMC/NM

Although individuals often associate sustainability with recycling, water conservation, and energy conservation, sustainability encompasses much more. In its essence, sustainability means making decisions that meet present needs without compromising the ability of future

generations to meet their own needs. Therefore, when broadly defined, sustainability encompasses actions to conserve resources, prevent pollution of resources, and regenerate resources when possible.

Sustainability touches nearly every element of an organization's operations. And given that UNMC/NM are large organizations with extensive operations, the sphere of sustainability at UNMC/NM is large as well. The following page illustrates and briefly explains the connection between key areas of UNMC/NM's operations and sustainability. While these connections are explored in more depth in the Appendix, at a high level, sustainability has strong ties to community health and the environment, UNMC/NM's integrated vision, and previous work completed by both organizations.

Community Health and the Environment

Emissions, air and water pollution, extraction of natural resources, and factors in the urban environment have been linked to community and environmental health problems. Sustainability helps reduce these harmful impacts by reducing emissions, reducing pollution through conserving resources, and increasing individuals' awareness of how they can help achieve these beneficial outcomes.

Vision Alignment

UNMC/NM's integrated vision is to be a world-renowned health sciences center

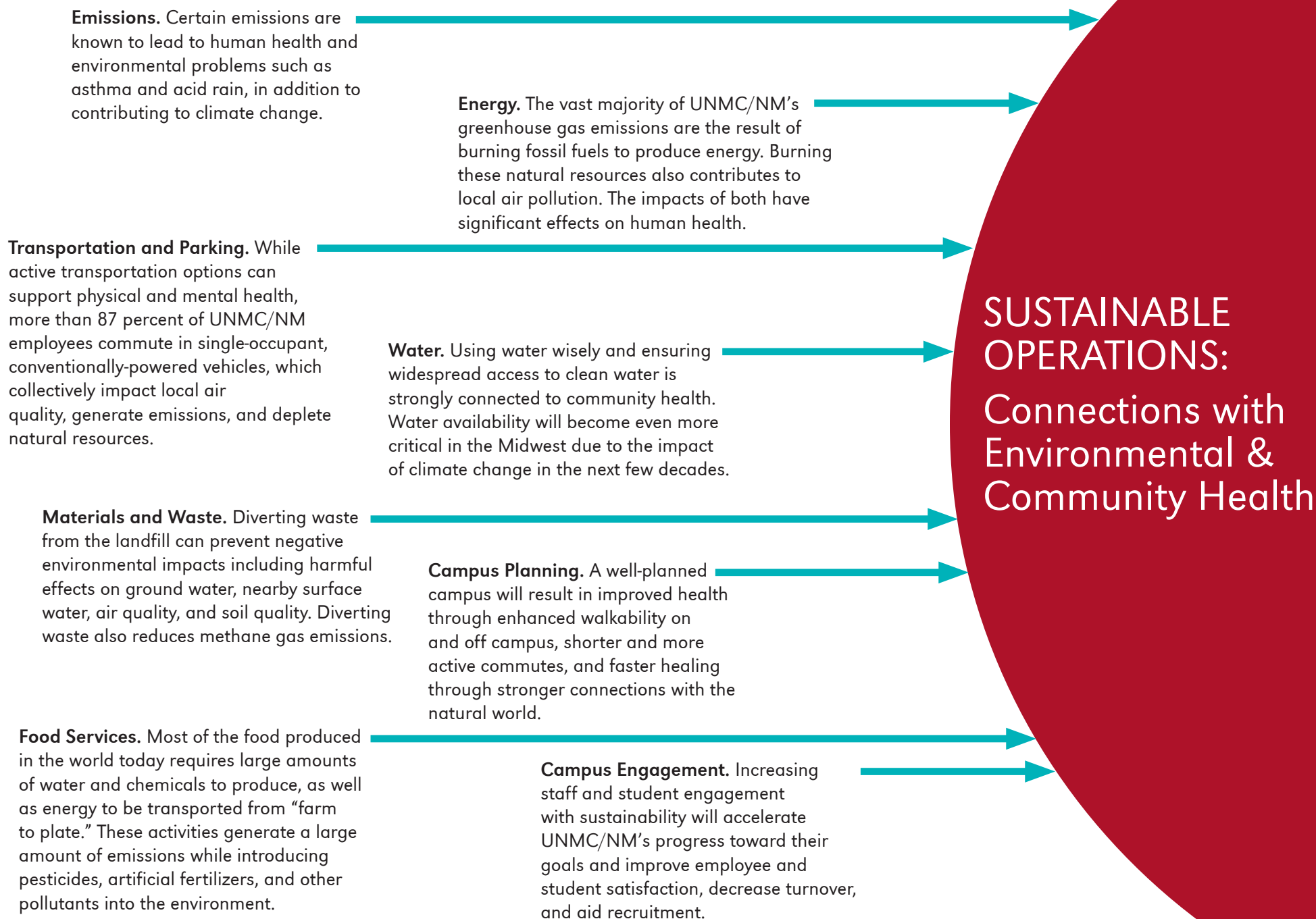
that provides extraordinary health care. Part of the vision also includes advancing a historic commitment to community health. This organizational ambition aligns well with sustainability-related actions such as reducing the amount of harmful or toxic substances released in the built and natural environment; creating smaller amounts of waste; and carefully managing financial, human, and natural resources in unison.

Previous Work

This Plan builds upon a foundation of previous sustainability work completed by UNMC/NM. Past sustainability efforts include continuous expansion of the campus-wide recycling program, the development of Nebraska Medicine's original Energy & Sustainability Master Plan in 2011, and a series of excellent education and awareness programs conducted by UNMC/NM's two green teams (the Energy Advocates Team and UNMC LiveGreen). Additionally, recent energy efficiency and conservation efforts spearheaded by the Facilities Management and Planning Department have achieved significant financial and environmental benefits, and garnered attention from the U.S. Department of Energy. Given this past success and UNMC/NM's commitment to sustainability, the two organizations are now intensifying the extent to which they explore all aspects of sustainability throughout their operations.

Sustainability is Vital

89 percent of employee and student respondents to a recent sustainability survey at UNMC/NM indicated there is a connection between environmental stewardship and UNMC/NM's health-oriented missions.





Peer Evaluation

UNMC/NM have peers in higher education and the health care industry. In both fields, sustainable practices are quickly becoming commonplace as more and more organizational leaders realize the importance of sustainability to health-focused educational and operational missions.

Higher Education

Colleges and universities are integrating sustainability into their operations at a rapid pace, and many of UNMC/NM's peers have well-organized sustainability plans and initiatives. It is less common for stand-alone medical schools to have their own sustainability plans, but many traditional universities with medical school programs and medical centers have a strategic plan in place that addresses sustainability and covers their professional schools and medical facilities. In either case, there are a number of goals and best practices included in the existing sustainability plans from these peers that are relevant to UNMC/NM.

For example, the University of California San Francisco (UCSF) is the only UC campus solely dedicated to graduate education in health and biomedical sciences, related research, and patient care, making it similar to UNMC/NM.⁴ Also like UNMC/NM, UCSF is a top-rated primary care medical school. UCSF's own Sustainability Action Plan notes

that sustainability and health care have much in common: a desire to provide for the future, an attention to the whole as well as the parts, and a pledge to protect human and environmental health.⁵

The UCSF plan, completed in 2011, addresses and includes goals in areas such as campus planning, energy, food services, education and communication, green buildings, purchasing, transportation, and recycling. Examples of goals in the UCSF plan include: divert 75 percent of waste from the landfill by the end of 2014; continually reduce the percent of workers, staff, and students arriving to campus by single-occupancy vehicles; and reach emissions levels equal to the year 1990 by the year 2020.

Other plans provide examples of what UNMC/NM are striving for. Harvard Medical School has a goal of reducing emissions 30 percent below its 2006 baseline by 2016 and conducts sustainability assessments of its laboratories. Duke University's climate action plan calls for climate neutrality by 2024, which will include changes to on-campus emissions sources, as well as purchasing emissions offsets. In 2012, Yale University set a waste diversion goal of 50 percent by 2016 and plans to achieve this goal by increasing recycling and reducing food waste.

ACUPCC

The American College and University Presidents' Climate Commitment (ACUPCC)⁶ is a voluntary pledge recog-

nizing the causes and impacts of global warming and a commitment to take specific action with a goal to reduce and neutralize greenhouse gas emissions. As of January 2014, more than 680 higher-education institutions have signed onto ACUPCC, including three schools in Nebraska: Central Community College, College of Saint Mary, and Creighton University.

Green Campuses

In the 2013 edition of Princeton Review's Guide to Green Colleges, 322 colleges earned a spot on the list (Creighton is the only Nebraska school). The list recognizes schools "that have made a notable commitment to sustainability." The Guide reports that per a 2012 survey, over 60 percent of student respondents indicated that information about a school's commitment to the environment would be very important in assessing whether to attend a given college or university. Institutions listed in the Guide to Green Colleges include many Big Ten Conference schools and institutions with notable medical schools, such as Johns Hopkins University, Stanford University, and the University of Chicago.⁷

AASHE

The Association for the Advancement of Sustainability in Higher Education (AASHE) is a nonprofit organization that provides resources, professional development, and a network of support for its member institutions. Currently, AASHE

"I would like to see [UNMC/NM] be a leader in sustainability."

- UNMC/NM Survey Respondent

has over 800 colleges and university members, including the following Nebraska institutions: University of Nebraska-Lincoln (UNL), University of Nebraska Omaha (UNO), University of Nebraska Kearney (UNK), Central Community College, College of Saint Mary, Creighton University, Doane College, and Metropolitan Community College (MCC).⁸ AASHE also offers the Sustainability Tracking, Assessment, & Rating System (STARS), which is a framework for higher education institutions to measure their sustainability performance. UNL and UNO have already participated in STARS earning bronze ratings.⁹

Sustainable Funding

More and more institutions are making a financial commitment to sustainability. According to the 2012 Greening the Bottom Line report from the Sustainable Endowments Institute, green revolving funds (GRF) are sustainability financing mechanisms that have grown 15-fold in the past decade alone. There are 79 GRFs on 76 campuses in 31 U.S. states and two Canadian provinces. Over 900 energy efficiency projects have been initiated using GRF funding.¹⁰

Many institutions with a medical school on campus again show up on the list of schools with a GRF: Stanford University, University of Minnesota, Harvard University, University of North Carolina, and the University of Pennsylvania.

Health Care Industry

The health care industry is fully embracing sustainability as well given the direct ties to community health, the related employee engagement benefits, and opportunities to reduce costs. In a 2012 Climate Disclosure Project report, 97 percent of S&P 500 health care companies surveyed reported that they now have board or executive-level oversight for sustainability.¹¹ There are also numerous organizations, initiatives, and certifications that have arisen over the past decade focused specifically on sustainability policies and practices within the field of health care.

One of the most well-respected, nonprofit member organizations dealing with sustainability in health care, Practice Greenhealth, has over 1,260 member hospitals, health systems, and health care facilities, including five from Nebraska: Alegent Creighton Health; McCook Community Hospital; and Catholic Health Initiatives' Good Samaritan Hospital, Saint Elizabeth Regional Medical Center, and Saint Francis Medical Center.

In 2013, Practice Greenhealth reported that out of the 200 top-performing member hospitals, three out of every four indicated they have a formal plan in place that guides their sustainability efforts. Seventy percent of these hospitals also report having a full-time sustainability officer who helps oversee implementation of initiatives, which Practice Greenhealth has deemed critical per its research, along with the presence of an engaged executive team.¹²

In addition to the substantial environmental benefits and financial savings that have topped one billion dollars over the last five years by its award-winning member hospitals, Practice Greenhealth projects that engaging just 25 percent of the entire U.S. hospital market to complete feasible energy and waste reduction initiatives could save billions of dollars for the health care sector, which echoes previously noted research conducted by the Commonwealth Fund.

As more health care facilities and hospitals become aware of the financial opportunities connected to sustainability and the pressure to cut costs continues to build in light of shifting reimbursement models attributed to health care reform, sustainability will continue to become even more of a mainstream focus within the health care sector. It is a cost-effective means by which health care organizations can better achieve their community health-oriented missions, while demonstrating environmental stewardship.

Baselines, Goals, and Strategies

The following sections each address an area under UNMC/NM's operations that impacts sustainability. The Plan provides a snapshot of where UNMC/NM stand in each area by providing baseline data. It then shows one or more goals in each area, as well as recommended strategies for achieving those goals.



"I think it is great that [UNMC/NM] is addressing sustainability issues and greenhouse gases."

- UNMC/NM Survey Respondent

Emissions

Emissions affect human health and the environment. Air pollution from burning fossil fuels has direct health impacts that contribute to asthma, respiratory irritation, chronic bronchitis, premature death, acid rain, and ground-level ozone (which leads to smog).¹³ Greenhouse gases also negatively affect the environment due to their contribution to climate change, which will impact Nebraska through more extreme weather events such as drought, storms, and heavy rain events.¹⁴

As shown in Figure 1, UNMC/NM's largest amount of emissions is attributed to purchasing electricity, which is generated by Omaha Public Power District (OPPD) as a result of primarily burning coal, a fossil fuel that produces air pollution and greenhouse gases during combustion.¹⁵

Baseline

As defined by the Greenhouse Gas Protocol, Scope 1 emissions are all direct emissions from sources that are owned or controlled by UNMC/NM. Scope 2 emissions are emissions that are a consequence of the consumption of purchased electricity, heat, or steam. Scope 3 emissions are other indirect emissions.¹⁶

UNMC/NM's greenhouse gas emissions baseline is 154,793 metric tons of CO₂e per year, based primarily on calendar year 2010 (see Figure 1).

Goals

Short Term

Reduce greenhouse gas emissions by 30 percent by the end of 2023

Long Term

Achieve climate neutrality by 2050 (zero net emissions)

Recommended Strategies

There only a few emissions-specific strategies listed in this section because many of the recommended strategies from other areas can each significantly reduce emissions. Therefore, the emissions-related strategies noted below are aimed more at UNMC/NM's organization-wide approach to reducing emissions.

The strategic recommendations for emissions are divided into "primary" and "secondary." The primary recommendations offer a foundation upon which UNMC/NM can build. The secondary recommendations provide examples of possible strategies UNMC/NM might use to build on that foundation and to achieve the emissions goals.

Primary Recommendations

- Sign the American College and University Presidents' Climate Commitment
- Account for and reduce use of greenhouse gas and chlorofluorocarbon-based refrigerants

Secondary Recommendations

- Continue aggressively working toward greater energy efficiency, conservation, and innovation
- Incorporate renewable sources into UNMC/NM's energy generation mix
- Advocate for a cleaner mix of energy generation by OPPD
- Purchase emissions offsets

Please note that the emissions section of the Appendix provides more detailed information regarding these primary and secondary recommendations.

Sustainability is Vital

32,588

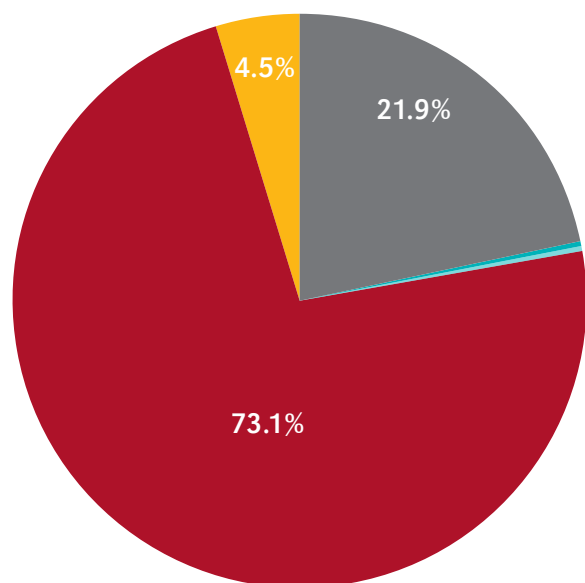
passenger vehicles produce the same amount of annual greenhouse gas emissions as UNMC/NM does over the course of a year.¹⁷

Sustainability is Vital

684 American college and university presidents

have already signed the American College and University Presidents' Climate Commitment.

UNMC/NM Emissions Baseline Profile



Scope 1 Sources

On Campus Stationary*	634,998	33,890
Refrigerants & Chemicals	–	140
Direct Transportation	9,413	688

Scope 2 Sources

Purchased Electricity	551,432	113,087
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Scope 3 Sources

Transmission & Distribution Losses	34,082	6,990
------------------------------------	--------	-------

*natural gas, fuel oil #6, and diesel

TOTAL: 154,793

Figure 1

The graph above shows the baseline annual emissions profile for UNMC/NM. The data used for the emissions components are primarily from calendar year 2010; however, due to a lack of available 2010 data for some transportation fuel consumption, supplemental data were used from calendar years 2011 and 2012 to establish an annual emissions baseline and profile.

Baseline emissions from refrigerants and chemicals account for less than 0.1 percent of UNMC/NM's annual emissions and are not shown in the chart. Following the Climate Registry guidelines, refrigerants R-22, R-12, and R-11 are not reported in this GHG inventory. The Climate Registry sets guidelines for GHG reporting based on international and interdisciplinary agreements.

Per standard protocol for this level of a greenhouse gas profile, only transmission and distribution losses were included for Scope 3 emissions, which entail indirect greenhouse gas emissions from sources not owned or directly controlled by the respective organization. For example, the Scope 3 emissions connected to UNMC/NM employee and student commuting and business travel were omitted. The widely accepted Campus Carbon Calculator, which is managed by the University of New Hampshire Sustainability Institute and the Clean Air Cool Planet organization, was used to complete the baseline greenhouse gas inventory.¹⁸

Helpful Definitions

CO₂eq: refers to carbon dioxide equivalent, which is a metric that is commonly used to compare the emissions from various greenhouse gases regarding their global warming potential. MtCO₂eq refers to metric tons of CO₂eq.

MMBtu: Btu refers to a British Thermal Unit, which is a standard unit of energy that is commonly used when combining other units of energy (e.g., watts of electricity and therms of natural gas) to express total energy consumption. MMBtu equals one million Btu.

kW: A watt is a commonly used measure of electrical power consumption. kW equals one thousand watts.



Energy

The majority of the energy that UNMC/NM consume is in the form of electricity (see Figure 3). As noted previously, OPPD generates this energy for UNMC/NM by primarily burning coal, a fossil fuel that produces air pollution and greenhouse gases during combustion. Significant energy is also consumed on campus as natural gas, and a small portion of the energy profile entails fleet fuel, generator diesel, and fuel oil.

While fleet fuel is categorized as part the UNMC/NM energy mix, it is not included in the energy goal metric due to its relatively small part of total energy and the lack of readily available data. However, fleet fuel is included as part of UNMC/NM's emissions profile.

While reducing fleet fuel would not reduce energy consumption, most of the driving by fleet vehicles happens on and around UNMC/NM campus. Therefore, any reduction in fleet fuel use—either through cleaner vehicles or less driving—will have a direct positive impact on patients by improving air quality on and around campus.

Leveraging the success of previous energy-efficiency and conservation efforts on campus, the goals and strategies in this section primarily focus on energy used in buildings. Achieving these goals could save UNMC/NM between \$1 million to \$3 million per year by 2023 and help limit air pollution and emissions, thereby promoting environmental and community health.

"It would be wonderful if [NM/]UNMC implemented solar and wind power on top of the buildings and also in the parking lots."

- UNMC/NM Survey Respondent

Baselines

The baseline figure for energy includes the consumption of electricity, natural gas, generator diesel, and fuel oil for the calendar year 2010.

Primary Metric

- **Total annual building energy consumption**
 - Baseline: 2,369,866 source MMBtu (calendar year 2010)
- **Annual peak kilowatt demand**
 - Baseline: 28,920 kilowatts (August 2010)

Secondary Metric

The secondary metric is normalized for the total size of campus facilities and for weather fluctuations, and it can potentially be used to compare the UNMC/NM campus to other health care and university facilities.

- **Weather-normalized energy-use intensity per square foot**
 - Baseline: 508 kBtu per square foot (based on 4,537,543 square feet, which does not include parking garages)

Goals

Building Energy

Reduce annual building energy consumption by 25 percent by the end of 2015, and an additional 10 percent by the end of 2023.

Peak Electricity Demand

Reduce peak electricity demand by 25 percent by the end of 2015, and an additional 10 percent by the end of 2023

Recommended Strategies

Energy strategies fall into the categories of short term and long term. Short-term strategies are generally actionable within five years, and long-term strategies may fall into the five- to ten-year time frame or as opportunities evolve.

Short Term

- Resolve the building system temperature differentials to enable building equipment to operate more efficiently and predictably
- Modify and optimize equipment operations to minimize the total amount of equipment online and improve the operational sequence of the system in order to maximize efficiency as tested and verified

Sustainability is Vital

12,828

typical Nebraska homes use the same amount of electricity in a year that UNMC/NM consumes annually; this is roughly equivalent to the energy used by used by Papillion and Beatrice households combined.



Figure 2

The images above show two pieces of Creighton University's renewable energy generation equipment. The image on the left shows four 1.2 kilowatt vertical axis wind turbines. The image on the right shows part of an 85 kilowatt solar array located in a parking lot that also provides shade. Within the next decade, UNMC/NM could begin exploring options to incorporate similar small-scale renewable energy generation on their own campus to offset purchased electricity, reduce their emissions, and increase their energy resiliency.

- Implement automation technologies to operate equipment at its highest efficiency at all flow points
- Complete the process of standardizing and upgrading building control systems
- Install a flue gas economizer on the main stack to capture waste heat produced by the boilers and reuse it to make hot water for the system
- Conduct a comprehensive lighting audit and upgrade to incorporate more efficient lighting and enhanced, energy-saving lighting control technologies
- Improve building envelopes
- Implement additional energy conservation measures related to information technology
- Include energy-related criteria when purchasing computers, office equipment, and electronic medical equipment
- Improve UNMC/NM vehicle fleet efficiency through proactive maintenance, scheduled vehicle turnover, and consolidation

Long Term

Continue to identify partnership opportunities with public and private entities to develop innovative projects on campus that help achieve UNMC/NM's energy goals and demonstrate their commitment to being an energy leader. Strategies include:

- Obtaining part of UNMC/NM's transportation fuel from a biofuels producer

- Meeting part of UNMC/NM's electricity needs with on-site, small-scale renewable energy generation (see Figure 2)
- Integrating alternative fuel (such as natural gas or electric) vehicles into UNMC/NM's fleet
- Exploring opportunities to supplement or replace shuttle services with more efficient options
- Developing a dedicated revolving fund for efficiency projects

Please note that the energy section of the Appendix provides more detailed information regarding these short-term and long-term strategies.

UNMC/NM 2010 Building Energy Consumption Profile
(Source MMBtu)

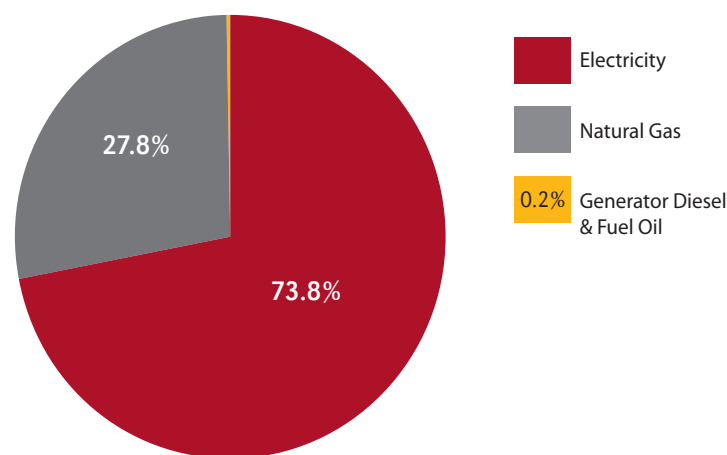


Figure 3

The pie chart above shows the breakdown of energy consumption by UNMC/NM. The largest two areas are electricity and natural gas.



Water

UNMC/NM's water consumption typically peaks in the mid-to-late summer coinciding with the time of year that requires the heaviest cooling loads and the peak time for irrigating lawns and landscaping. UNMC/NM's past energy conservation projects have reduced building water demand. Specifically, annual building water use decreased 36 percent from calendar year 2010 (see Figure 4).

The goal and strategies for this section seek to build on this recent success and primarily focus on the other two areas of opportunity regarding water use: irrigation and indoor water use (see Figure 5). By achieving their 2023 goal, UNMC/NM will significantly reduce the amount of water that needs to be treated and supplied to campus, and they will potentially save up to \$50,000 annually.

Baselines

The baseline figure for water is the total annual gallons of water used by UNMC/NM and represents an average of calendar years 2010 and 2011.

Primary Metric

- **Total annual water consumption**
 - Baseline: 225,164,787 gallons per year

"Incorporating plants on campus that don't need as much water would help save water."

- UNMC/NM Survey Respondent

"Using rainwater or grey water for landscaping purposes would be great."

- UNMC/NM Survey Respondent

Secondary Metric

The secondary metric is normalized for the total size of campus facilities, and it can potentially be used to compare the UNMC/NM campus to other health care and university facilities.

- **Water-use intensity per square foot**
 - Baseline: 53 gallons per square foot (based on total water consumption and 4,537,543 square feet, which does not include parking garages)

Goal

Water Consumption

Reduce annual gallons of water by 10 percent by the end of 2023

Recommended Strategies

Water strategies fall into the categories of short term and long term. Short-term strategies are generally actionable within five years, and long-term strategies may fall into the five- to ten-year time frame or as opportunities evolve.

Short Term

- Specify low-flow toilets and other efficient fixtures in any new buildings or renovations
- Install low-flow faucet aerators that reduce the flow rate to 0.5 gallons per minute or less where appropriate

- Track, monitor, and communicate water consumption on a more frequent and detailed basis
- Create a Landscape Management Plan that incorporates water-wise strategies, policies, landscaping, and irrigation techniques

Long Term

- Explore potential applications for pervious pavement on campus to reduce water runoff
- Pilot a system to use rainwater or reuse grey water in a current or future buildings on campus

Please note that the water section of the Appendix provides more detailed information regarding these short-term and long-term strategies.

Sustainability is Vital

341 Olympic-size swimming pools would be filled by the amount of water consumed by UNMC/NM in a typical year.

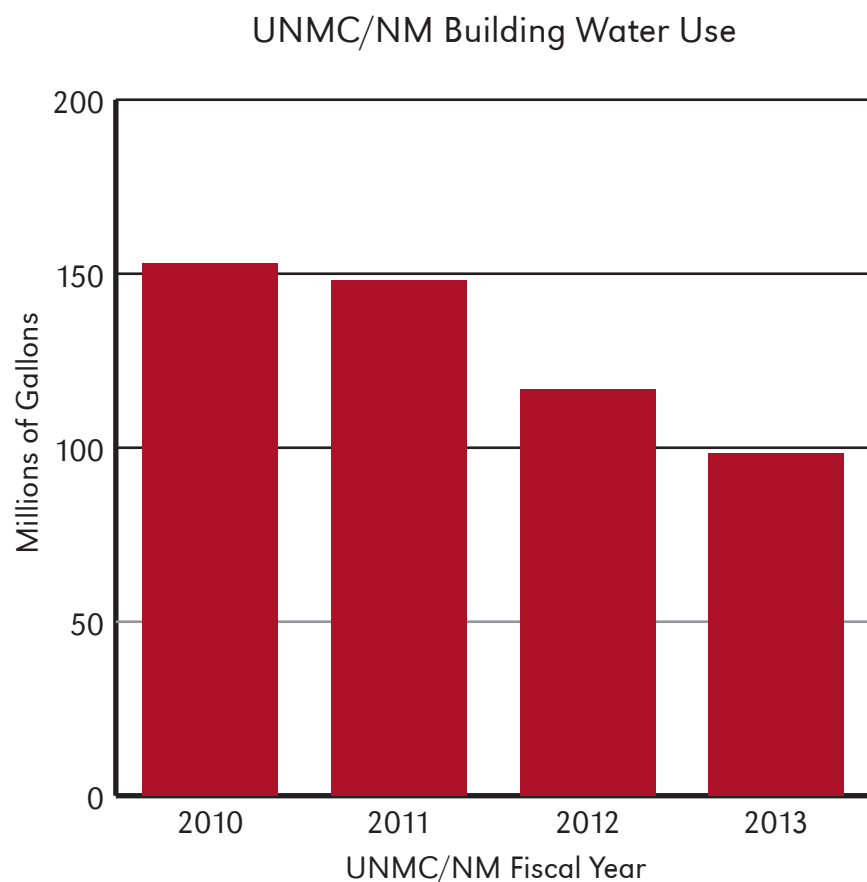


Figure 4
The graph above shows water consumed by UNMC/NM for separately metered building use. More water efficient building operations and fixing leaks decreased water consumption in the past few years, resulting in a 36 percent decrease in annual building water use.

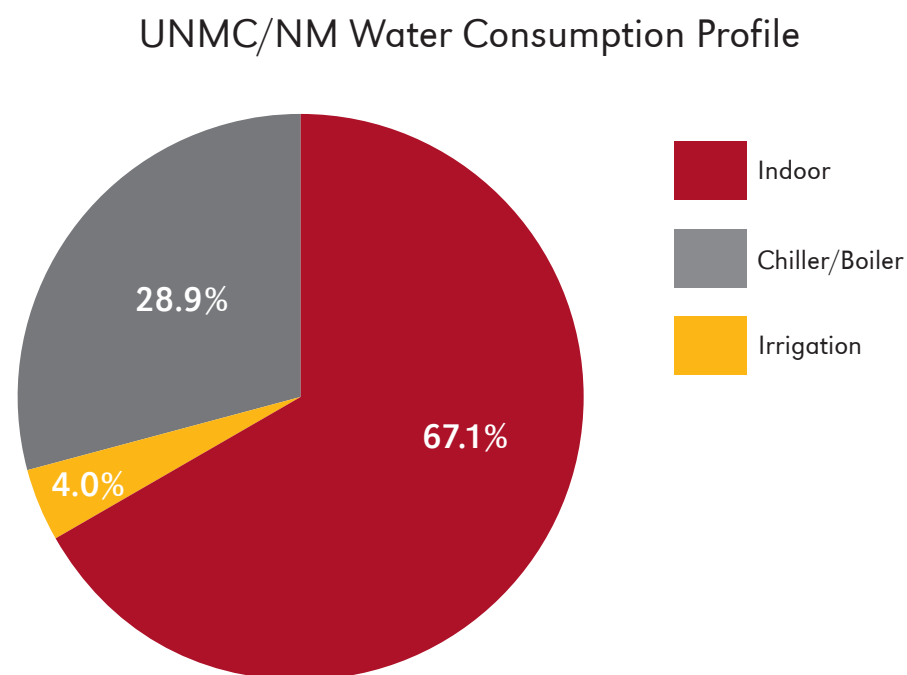


Figure 5
The graph above shows the breakdown of UNMC/NM's average annual water consumption based on the average of calendar years 2010 and 2011. Over two-thirds of the water is used for indoor consumption, while the remaining water is used for heating and cooling buildings or outdoor irrigation.



"[UNMC/NM] should be a leading advocate and model of comprehensive recycling and reuse."

- UNMC/NM Survey Respondent

Materials

Medical center campuses have a diversified waste profile consisting primarily of the following material streams: trash, regulated medical waste, hazardous waste, pharmaceutical waste and recycling.

The recycling category encompasses a mix of materials, including mixed paper, plastic, tin, scrap metal, and fluorescent tubes. Over the past two decades, UNMC/NM have made great strides in the area of recycling by expanding the types of material collected and diverting over 21 million pounds of recyclable material. Despite this success, there are still many opportunities to further expand the program and to employ different waste reduction strategies that limit the amount of outgoing material that needs to be processed.

If UNMC/NM employ the strategies in this section and achieve their 2023 waste reduction and recycling goals, they will dramatically reduce the amount of material routed to a landfill and potentially save up to \$35,000 annually.

Baselines

The baseline values for annual disposal and recycling diversion for UNMC/NM represent averages calculated from data for fiscal years 2011 and 2012. Figure 6 shows the breakdown of specific waste types that make up the baseline.

Primary Metrics

- **Total Disposal:** the total annual weight of all outgoing materials (waste and recycling)
 - Baseline: 7.5 million pounds per year

- **Recycling Diversion:** percent of total outgoing materials diverted to recycling
 - Baseline: 22.9 percent (1.8 million pounds)

Secondary Metric

The secondary metric is normalized for the total size of campus facilities. This metric can also potentially be used to compare UNMC/NM to other health care and university facilities.

- **Waste generation intensity per square foot**
 - Baseline: 1.27 pounds per square foot (based on 5,749,502 pounds of annual material that is not recycled and 4,536,868 square feet, which does not include parking garages)

Waste generation intensity per full-time equivalent (FTE) employee and student was also considered as a secondary metric. However, due to lack of available data regarding FTE employees who are primarily located on UNMC/NM's 42nd & Dewey campus, this secondary metric was not included. As this data becomes available, UNMC/NM should consider tracking this intensity metric.

Goals

Total Outgoing Material

Reduce the total annual weight of outgoing material by 25 percent by the end of 2023

Diversion Rate

Increase the percent of outgoing materials diverted (recycled) from the landfill to 35 percent by the end of 2023

Recommended Strategies

Materials-related strategies fall into the categories of short term and long term. Short-term strategies are generally actionable within five years, and long-term strategies may fall into the five- to ten-year time frame or as opportunities evolve.

Short Term

- Implement paper reduction initiatives, such as paperless meetings, default duplexing, and departmental printing reduction goals
- Infuse sustainability principals into procurement policies and processes
- Implement trash and recycling process improvements such as increasing recycling receptacles and education
- Reduce lab-related trash by moving toward more reusable or recyclable materials and providing education
- Implement waste reduction strategies in the Surgical Services Department and other medical areas known for generating high volumes of waste

Long Term

- Enhance surplus store technologies to allow easier access to inventory
- Adopt actions that support the goal of sending zero food waste to the landfill

Please note that the materials section of the Appendix provides more detailed information regarding these short-term and long-term strategies.

Profile of UNMC/NM's Outgoing Materials

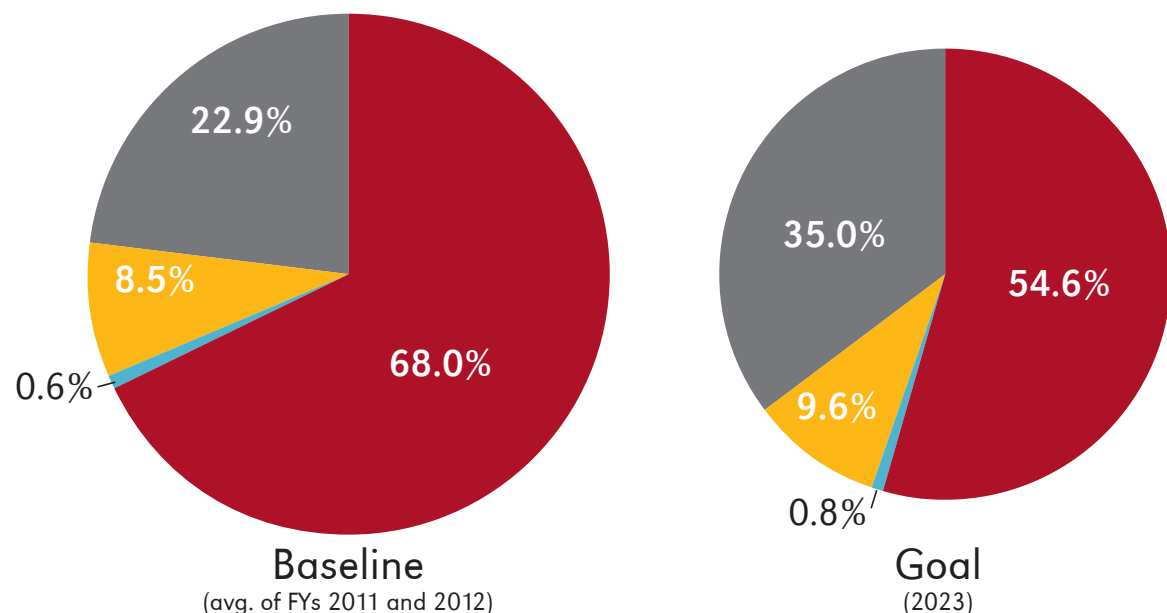


Figure 6

The graphs to the left show the profile of outgoing materials for the baseline and what that profile might look like if UNMC/NM reaches the 25 percent overall reduction and 35 percent recycling diversion goals. The total amount of regulated medical waste (RMW), hazardous waste, and pharmaceutical waste captured currently is unlikely to decline because UNMC/NM perform very well relative to other large medical campuses. Most of the reduction will likely occur through trash diversion.

It is important to also note that the graph on the right is slightly smaller in size because if UNMC/NM achieve their overall 25 percent reduction goal, they will decrease the total weight of outgoing material (both waste and recycling), thereby, shrinking the pie. This can be accomplished through efforts to reduce waste on the front end, such as ordering supplies with less packaging, so that less waste disposal and recycling are necessary. Additionally, since RMW, hazardous waste, and pharmaceutical waste presumably will not see significant reductions, the percentage of the profile for these special waste streams will likely increase, but the total amount will remain the same.

Trash	5,071,408 lbs.		3,054,461 lbs.
Recycling	1,709,499		1,957,988
Regulated Medical Waste	636,057		537,048
RCRA and non-RCRA Hazardous Waste, and Pharmaceutical Waste	42,038		44,754
TOTAL	7,459,002 lbs.		5,594,251 lbs.

Sustainability is Vital

746 The combined weight of 746 female Asian elephants is equal to the total annual weight of UNMC/NM's trash, regulated medical waste, hazardous waste, and pharmaceutical waste.



“[UNMC/NM] should have an incentive program for people to bike, walk, and take public transportation to work.”

- UNMC/NM Survey Respondent

Transportation and Parking

Parking cost, availability, and demand reduction programs can influence the transportation choices of staff, students, and visitors when traveling to campus.

With approximately 15,000 individuals traveling to campus daily¹⁹, UNMC/NM's campus has a significant impact on the traffic in midtown Omaha. Adopting policies that encourage use of active or lower-emission transportation options can reduce road congestion, reduce pollution, promote healthy lifestyles, and preserve infrastructure.

Baselines

UNMC/NM employees and students completed a transportation survey in March 2012. The survey provided the baseline data for this Plan (see Figure 7).

Primary Metric

- **Mode Split:** the percent of employees and students commuting to campus by a means other than driving alone in a vehicle.
 - Baseline: 12.7 percent

Secondary Metric

- **Total Parking Spaces:** the number of parking spaces available on campus.
 - Baseline: 8,925 (calendar year 2012)

A parking space ratio (number of full-time equivalent employees and students per parking space) was also considered as a secondary metric. However, due to lack of available data regarding full-time equivalent employees who are primarily located on UNMC/NM's 42nd & Dewey campus, this metric was not included. As this data becomes available in the future, UNMC/NM should consider tracking this intensity metric, which will provide another approach for comparing UNMC/NM to other health care and university facilities.

Goal

Commuter Mode Split

By the end of 2023, increase to 20 percent the percentage of commuting trips that occur by modes other than driving alone in a conventionally-fueled vehicle

Recommended Strategies

Transportation and parking-related strategies fall into the categories of short term and long term. Short-term strategies are generally actionable within five years, and long-term strategies may fall into the five- to ten-year time frame or as opportunities evolve.

Short Term

- Develop a Transportation Plan that integrates a vision for pedestrians, cyclists, public transit users, and vehicles on and around campus
- Improve the pedestrian experience by addressing dangerous pedestrian intersections and improving wayfinding
- Promote and support transit use (see Figure 8) and partner with Metro Transit as it expands its services in central Omaha and along Dodge Street
- Support expanding bicycling infrastructure on and around campus such as trails, bike lanes, sharrows, bike parking, cyclist showers, and bike sharing (see Figure 9)
- Provide flexible transportation programs, such as car-sharing and emergency-ride-home programs (see Figure 9), and a flexible work hours program
- Support sustainable vehicle use such as carpooling, fuel-efficient vehicle use, no-idling policies, and reduction of surface parking

Long Term

- Incorporate a new transit or transportation center into the campus master plan

Please note that the transportation and parking section of the Appendix provides more detailed information regarding these short-term and long-term strategies.

Mode Split for Commuting Trips

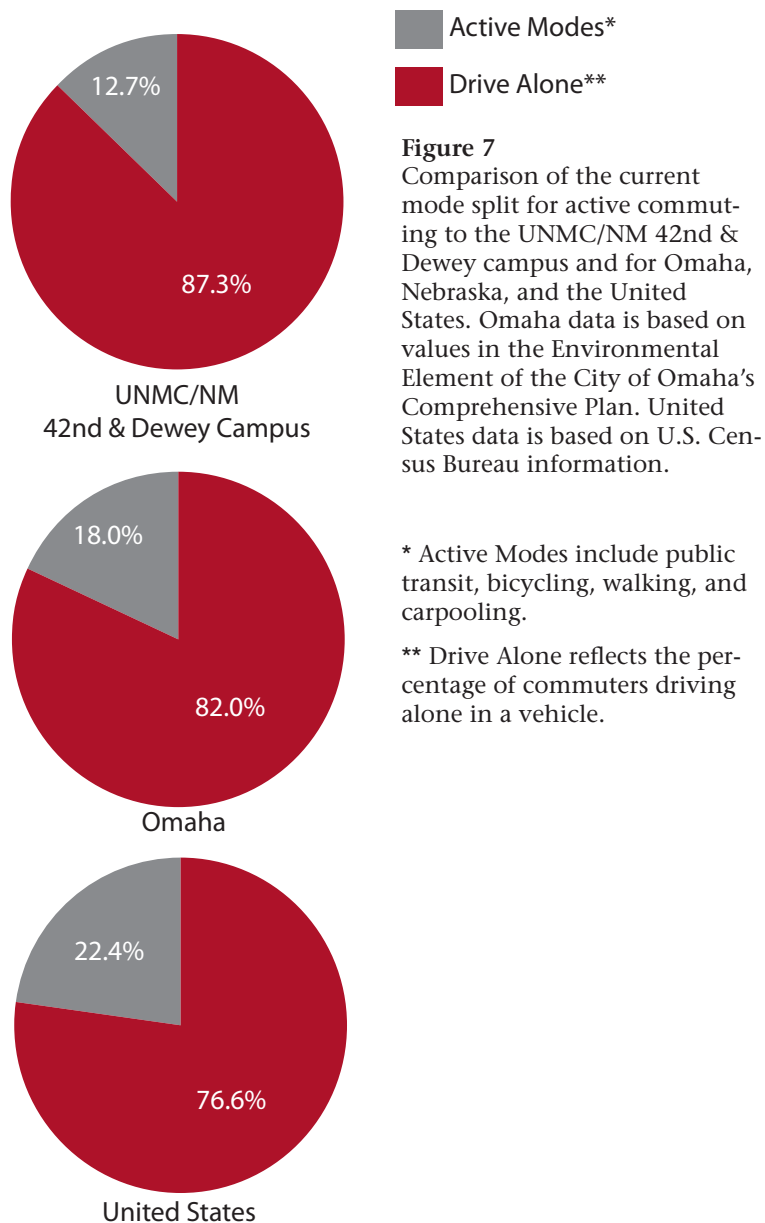


Figure 8
Both MCC's Pass to Class program and UNO's MavRide program provide free transit passes for students. In Spring 2011, when only 400 passes were provided, UNO students using MavRide passes reduced driving trips to campus by 52 percent, saving an average of 129 parking spaces per day. UNMC/NM could explore a similar type of program for students and/or staff to alleviate parking demand and limit single-occupant vehicle trips to campus.



Figure 9
Bicycle sharing (B-cycle, left image) is already present on the UNO campus. Additionally, car sharing (Zipcar, right image) is available at UNO, UNL, and Creighton University. These programs allow students and staff to rent cars and bicycles by the hour for a nominal fee to run errands, get to appointments, or deal with emergencies. Similar programs could be implemented at UNMC/NM to support individuals who carpool, walk, bike, or use transit to commute to/from campus, thereby, reducing parking demand and emissions.



Food Services

Over the past decade, the movement to create healthier, more sustainable food systems and to reduce food waste on hospital campuses has intensified. On average, more than 20 percent of a large hospital's total waste is food waste (see Figure 10), despite the fact that almost everything coming out of the kitchen and dining areas could be recycled or fed into a biological process (e.g., composting, anaerobic digestion, food for farm animals).²⁰

While there are numerous ways that food service operations can be more sustainable, many of the short-term strategies that are listed primarily focus on eliminating waste. The goal is for UNMC/NM's food service operations to become zero-waste, which the Zero Waste International Alliance defines as achieving at least 90 percent diversion of all waste from the landfill or incinerator.²¹ There are also short- and long-term strategies that focus on increasing the amount of sustainably-produced food offerings and promoting healthier lifestyles through good food choices.

By working with its long-term food services vendor, Sodexo, which has demonstrated a good foundation and willingness for adopting sustainable food service operations, UNMC/NM have the opportunity to further reduce the waste that they produce as well promote healthy food choices in alignment with their community health-oriented missions.

"There should be a commitment by the university and hospital to become a zero landfill facility."

- UNMC/NM Survey Respondent

Baseline

There is no specific metric or baseline for food services. Due to the nature of the goal, its achievement will be known when it is reached rather than relative to a given baseline value.

Goal

Food Services Waste

By the end of 2023, divert at least 90 percent of kitchen and café waste from reaching a landfill

Recommended Strategies

Food services-related strategies fall into the categories of short term and long term. Short-term strategies are generally actionable within five years, and long-term strategies may fall into the five- to ten-year time frame or as opportunities evolve.

Short Term

- Focus on diversion of food waste into a more sustainable waste stream
- Establish a Healthy and Sustainable Foods Task Force to zero in on additional healthier food options and waste reduction strategies
- Replace Styrofoam products with more sustainable options in cafés and patient food services
- Transition back to more reusable dishes and flatware in the cafés

- Expand sustainable food education and promotional efforts
- Join hundreds of health care organizations in signing Health Care Without Harm's Healthy Food in Health Care Pledge, which will demonstrate a commitment to procuring local, nutritious, and sustainably-produced food

Long Term

- Bring more agriculture to campus by hosting community supported agriculture or a farmers market to give employees and students easier access to fresh foods
- Grow more food on campus by expanding the herb gardens and looking for creative ways to incorporate a community garden on site
- Increase and track the amount of food served and purchased in the cafés that is sourced from local and organic suppliers

Please note that the food services section of the Appendix provides more detailed information regarding these short-term and long-term strategies.

"Please work on reducing waste in the cafeteria, especially the styrofoam."

- UNMC/NM Survey Respondent

UNMC/NM's Food Waste Diversion Potential

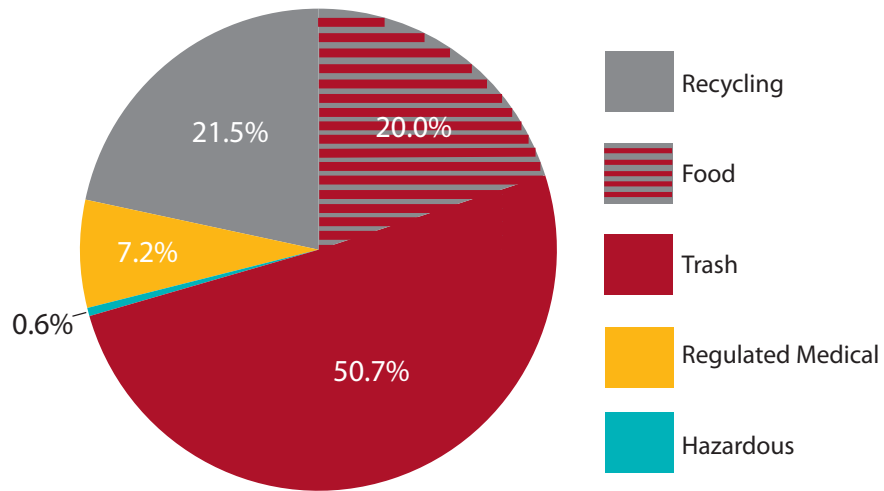


Figure 10
Practice Greenhealth estimates that up to 20 percent of a health care facility's waste is actually compostable food waste. The striped portion indicates the portion of trash that could potentially be diverted to compost or used as animal feed on a farm.

Sustainability is Vital

78 percent of UNMC/NM employees and students who completed a recent survey indicated they would like to see an increase in healthy and sustainable food options served in campus cafés.



Sustainability is Vital

280,000 Styrofoam clamshell containers were used on campus through food services in 2012, not including off-campus vendors that cater. This number of clamshells placed end-to-end would be 39 miles long. This material does not break down in a landfill.



"I would love to live close to work to minimize commute times and energy usage, but none of the current options in the area appeal to me."

- UNMC/NM Survey Respondent

Campus Planning

The UNMC/NM campus has a weekday population of around 15,000. Accordingly, UNMC/NM maintain a Facilities Development Plan to provide a vision and direction for growth on campus.

The campus planning section provides a few sustainability-related principles that can supplement the Facilities Development Plan. These principles encourage making the campus a more vibrant, active, and sustainable place for employees, students, patients, visitors, and the surrounding community.

Baseline

Maintaining relatively high density on and around campus provides better compatibility with transit, access for pedestrians and bicyclists, and it often drives economic development while combating sprawl. As such, a density metric was created for the campus that measures the amount of built space per developed acre as follows,

$$\frac{[\text{NM GSF} + \text{UNMC GSF} + \text{Clarkson GSF}]}{[(\text{NM acres} + \text{UNMC acres} + \text{Clarkson acres}) - \text{Major Green Space}^*]}$$

**Major green space is green space larger than .25 acres.*

where GSF = gross square footage of all buildings and parking garages on UNMC, Nebraska Medicine, and Clarkson College property (see Figure 11). GSF does not include surface parking lots.

It is important to note that this metric should be used only as a guide, rather than a definitive measure of campus planning success.

The campus density baseline is 73,327 GSF per developed acre as of December 31, 2010.

Goal

Campus Density

Maintain the 2010 density of 73,327 gross square feet of built space per developed acre

Recommended Strategies

The strategies for campus planning take the form of three guiding principles that can infuse concepts of sustainable development into the Facilities Development Plan. The principles are not as specific as strategies, but there are specific actions UNMC/NM can take that follow these principles. Examples of these specific actions are listed in the Appendix, while the three principles include:

- Fostering a mix of building uses to improve area vibrancy
- Using building placement and streetscape design to support active transportation options
- Providing high-quality public spaces to encourage interaction and support healing

Broader strategies not included with the principles above entail:

- Incorporating elements of the Sustainability Master Plan into the Facilities Development Plan
- Implementing a de-construction approach to building removal
- Improving the tree canopy
- Proactively monitoring indoor air quality
- Minimizing toxics in buildings

Please note that the campus planning section of the Appendix provides more detailed information regarding these short-term and long-term strategies.

Sustainability is Vital

14 Population rank of the UNMC/NM campus as compared to communities across Nebraska: just after Scottsbluff (15,039) and just before South Sioux City (13,353).²²

2010 UNMC/NM Main Campus

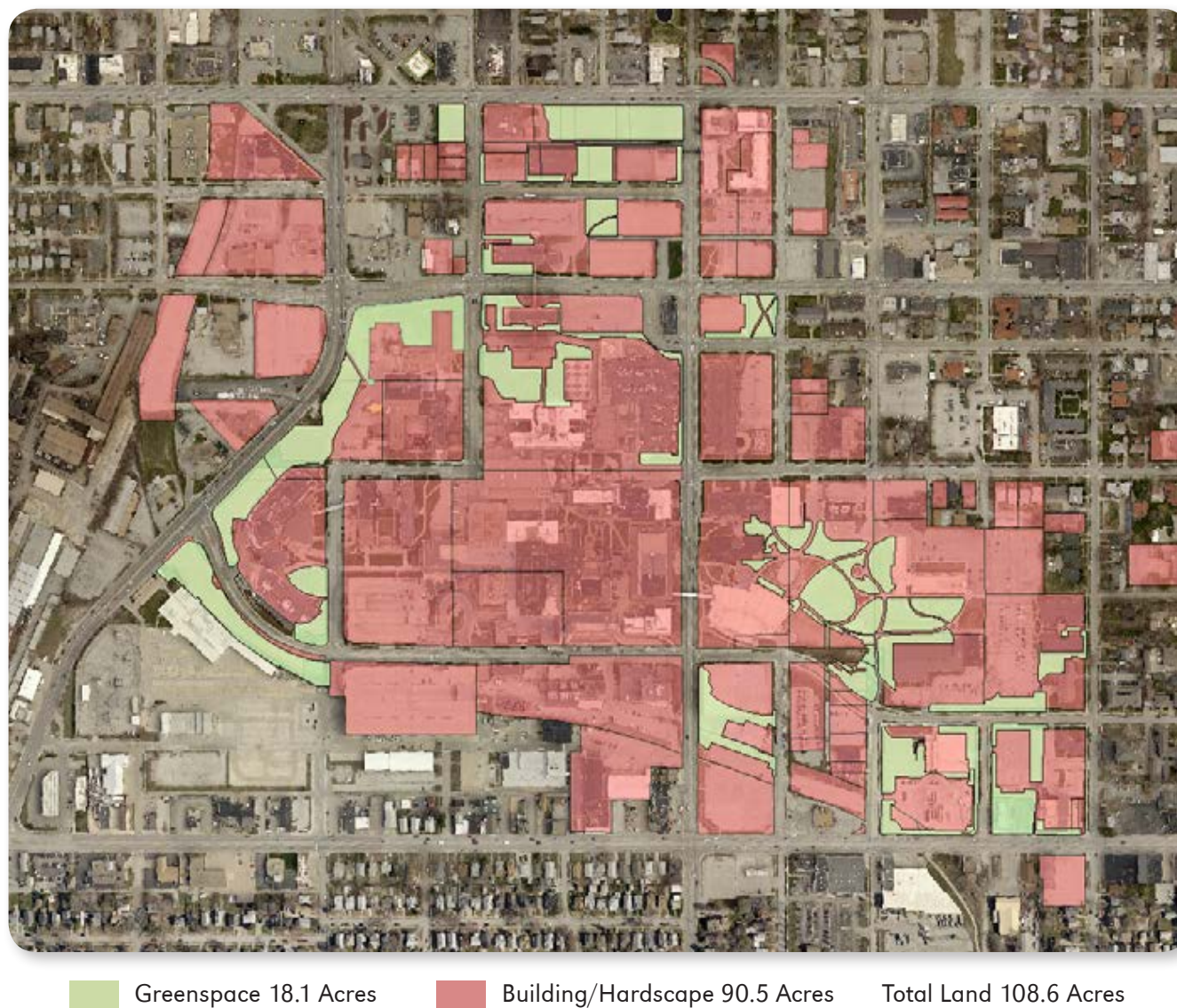


Figure 11

The aerial map above shows a breakdown of the 2010 UNMC/NM campus land use with developed areas in red and “major” green space in green. Of the 108.6 acres total campus acres (as of December 31, 2010), approximately 18.1 acres were significant green space (16.7 percent).



"It's important to let the [UNMC/NM] community know the results of efforts and that even the smallest actions and behaviors add up to make a difference."

- UNMC/NM Survey Respondent

Campus Engagement

In addition to serving as a major medical center educating approximately 3,500 professional students each year, UNMC/NM also represent two of the largest employers in the City of Omaha and the State of Nebraska with over 10,000 employees. These employees and students have demonstrated support for UNMC/NM's past sustainability efforts and for the continued expansion of the initiative. Per a recent survey, over 90 percent of employee and student respondents indicated that it is important to them that UNMC/NM are committed to sustainability. Much of this support is the result of the educational efforts of the two campus green teams: UNMC LiveGreen and Nebraska Medicine's Energy Advocates Team.

UNMC/NM can build upon this foundation of support and further engage employees and students about sustainability by implementing the strategies noted in this section. By doing so, UNMC/NM will foster an organizational culture that actively supports and is invested in the sustainability goals and initiatives, as well as embed environmental consciousness into daily business decisions and institutional projects.

Baseline

Results from two anonymous online surveys distributed to UNMC/NM employees and students in September 2012 and December 2012 were combined and averaged to establish a baseline Sustainability Engagement Score, which can range from

0 to 100 (see Figure 12). A higher Sustainability Engagement Score indicates that more employees and students are highly aware of UNMC/NM's sustainability efforts, highly knowledgeable about how to conserve energy and resources while at work or school, and regularly engage in various conservation behaviors on campus.

The baseline Sustainability Engagement Score for UNMC/NM is 45, based on the average of the awareness, knowledge, and behavior frequency metrics.

Goal

Employee and Student Engagement

Achieve a Sustainability Engagement Score of 75 by the end of 2023

Recommended Strategies

Engagement-related strategies involve engaging staff and students, as well as establishing mechanisms that provide organizational support and help communicate efforts to the community. The strategies fall into the categories of short term and long term. Short-term strategies are generally actionable within one to five years, and long-term strategies most likely will fall into the five to ten year time frame.

Short Term

- Establish an Office of Sustainability and hire a full-time Sustainability Manager
- Create an executive-level sustainability steering committee representing both organizations

- Track and communicate progress to employees and students
- Fully integrate sustainability into organizational strategic planning
- Adopt a joint sustainability statement or policy that demonstrates institutional commitment
- Join Practice Greenhealth and the Association for the Advancement of Sustainability in Higher Education
- Formalize and integrate the two green teams
- Expand campus education and communication efforts and conduct community outreach regarding sustainability
- Provide recognition opportunities
- Incorporate sustainability into employment and training elements, such as job descriptions and orientations
- Support satellite locations and organizational partners, such as Bellevue Medical Center and Clarkson College

Long Term

- Incorporate sustainability into curriculum by developing specific courses or integrating specific topics into existing classes.
- Include sustainability and its relation to public health into research goals
- Integrate sustainability as part of UNMC/NM's respective brands

Please note that the engagement section of the Appendix provides more detailed information regarding these strategies.

UNMC/NM Campus Community Engagement Metrics

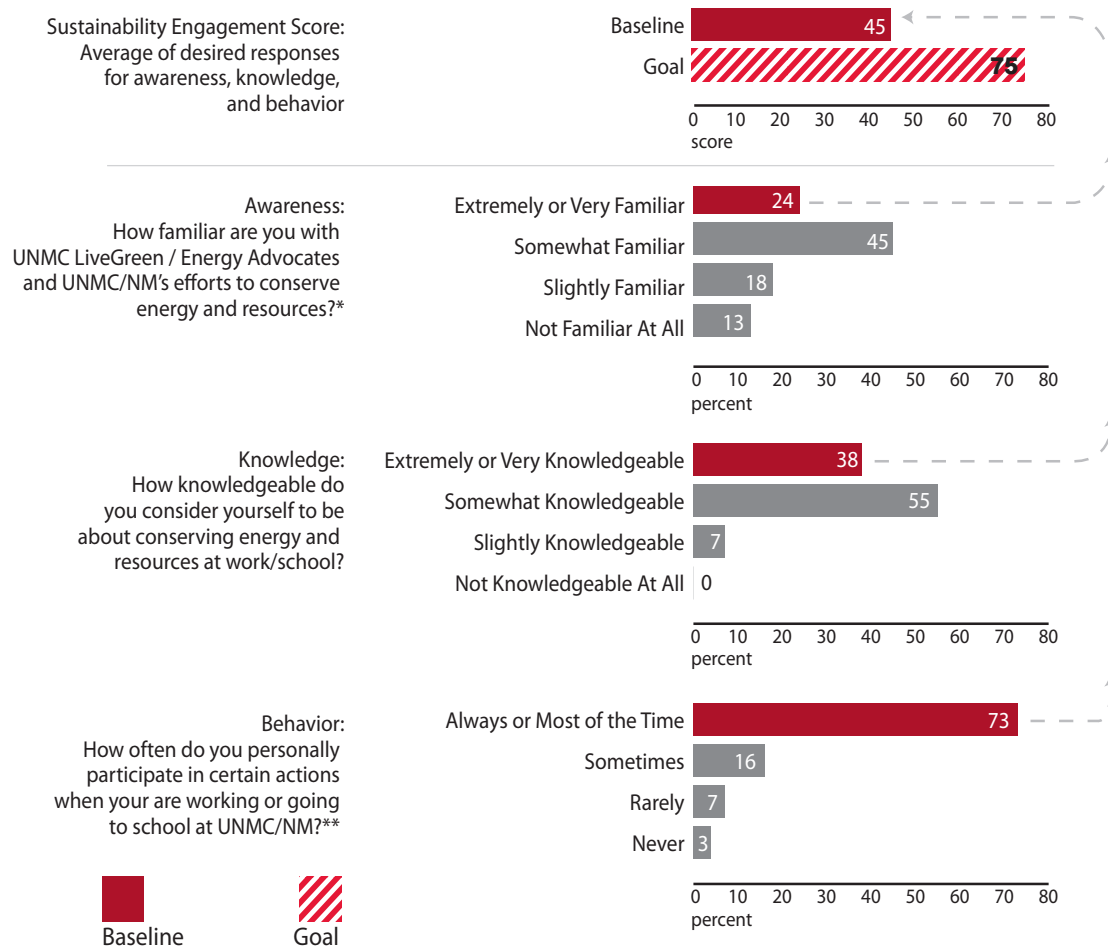


Figure 12

Establishing a baseline for engagement around sustainability involves a combination of several metrics related to awareness, knowledge, and behavior. Measurements of awareness, knowledge, and behavior are shown in the lower three graphs. The percent of respondents in the top category for each of these metrics are averaged to determine the baseline Sustainability Engagement Score. The baseline and goal for the Sustainability Engagement Score are shown in the top graph.

“UNMC LiveGreen and EAT [Energy Advocates Team] have done an excellent job of promoting initiatives on campus. Their efforts are definitely making an impact.”

- UNMC/NM Survey Respondent

* With the awareness question, respondents were asked about their specific organization and green team (e.g., UNMC respondents were asked about familiarity with UNMC LiveGreen and UNMC's sustainability efforts).

** Actions include: turning off lights, using fewer lights or lowering light levels, unplugging nonessential appliances, using reusable food and beverage containers, printing double sided, opening doors manually, shutting off computer monitors, recycling confidential paper, recycling plastic and metals, and closing blinds on hot, sunny days. It is important to note that positivity bias can occur when respondents self report the frequency of socially-desirable behaviors, which can result in slightly inflated responses.



Conclusion

As a leading academic health sciences center, UNMC/NM have a tremendous opportunity to become a regional, if not national, sustainability leader. UNMC/NM are already receiving national attention from the U.S. Department of Energy for their energy efficiency and curtailment efforts.

It is clear that UNMC/NM aspire to be a 21st-century leader in patient care, health sciences instruction, and research. UNMC/NM can support these aspirations through all aspects of their operations by embracing the relationship between community health and sustainability.

Notes

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13 U.S. Environmental Protection Agency, *Effects of Air Pollutants – Health Effects*, available at <http://www.epa.gov/eogapti1/course422/ap7a.html> (accessed on December 2, 2012).

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APPENDIX



EMISSIONS



Background: Additional Details

Interviews and meetings with individuals from UNMC/NM revealed a consensus on campus that climate change is a present reality, is primarily caused by human activity, and is having a negative impact on human health. Many individuals also acknowledged that there has been no vision or consensus on how aggressively UNMC/NM need to act to mitigate and adapt to climate change.

Acknowledging and acting upon the risks and opportunities associated with sustainability is increasingly common in the business world. According to a September 2012 Climate Disclosure Project report authored by PriceWaterhouseCoopers¹, a growing majority of S&P 500 companies see managing climate change as a business imperative:

- 92 percent reported board or executive-level oversight for climate change and sustainability initiatives.
- 74 percent identified climate change opportunities that have the potential to generate a substantive change in business operations, revenue, and expenditures.
- 73 percent are integrating climate change with overall business strategy.
- 83 percent have incorporated climate change into enterprise risk management.

Global business trends are even stronger. In 2013, Global Compact–Accenture completed a study that surveyed over 1,000 top executives from 103 different countries. The results indicated that 93 percent see sustainability as important to their company's future success, and 96 percent think sustainability issues should be fully integrated into the strategy and operations of a company.²

Previous Success

UNMC/NM have reduced greenhouse gas emissions by more than 20,000 metric tons of CO₂eq as a result of recent energy conservation efforts that decreased overall annual energy use by approximately 340,000 MMBtu.

Strategies: Additional Details

Account for Refrigerants

Develop an accurate, campus-wide measure of refrigerants used annually and develop a plan to reach zero use of greenhouse gas- and chlorofluorocarbon-based refrigerants in new and replacement heating, ventilation, air conditioning, and refrigeration building equipment.

Make a Public Commitment

By signing the American College and University Presidents' Climate Com-

mitment (ACUPCC), UNMC/NM will publicly solidify their commitment to sustainability. Signatories recognize the existence and dangers of global warming, commit to "creating a climate action plan to achieve climate neutrality as soon as possible," and agree to implement a few tangible actions to reduce greenhouse gases while the plan is being developed.

An appropriate and reasonable, yet bold, goal for UNMC/NM is to reach climate neutrality by 2050 (i.e., zero net emissions). Many of the strategies outlined in this Plan will help UNMC/NM achieve this goal, but they are just the beginning. Achieving climate neutrality may require the following additional actions:

- Continuing to aggressively work toward greater efficiency, conservation, and innovation in energy consumption beyond 2023.
- Incorporating renewable sources into UNMC/NM's energy generation mix. Renewable energy can be obtained directly through generation or through renewable energy certificates.
- Advocating for a cleaner mix of energy generation by Omaha Public Power District (OPPD). OPPD's power is primarily generated by fossil fuel combustion. UNMC/NM benefit when renewables become a larger portion of the energy generation mix.
- Engaging in actions that offset emissions and purchasing emissions offsets are the final pieces of the puzzle.

There are dozens of actions that offset emissions, such as planting trees.

UNMC/NM may also purchase credits to offset its emissions, but in doing so must ensure the veracity of those credits.

By signing onto ACUPCC, UNMC/NM will become the fourth higher education institution in Nebraska to make the commitment and the first in the University of Nebraska system. The most important component is the commitment to be climate neutral, which was widely supported by the Sustainability Master Plan Advisory Team and by student representatives from the Graduate Student Association and Student Senate.

Notes

1 PriceWaterhouseCoopers, *Accelerating Progress Toward a Lower-Carbon Future: Carbon Disclosure Project S&P 500 Climate Change Report* (2012), available at <http://www.pwc.com/gx/en/sustainability/publications/carbon-disclosure-project/index.jhtml> (accessed on December 1, 2012).

2 Accenture and United Nations Global Compact, *The UN Global Compact-Accenture CEO Study on Sustainability 2013*, available at <http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-UN-Global-Compact-Acn-CEO-Study-Sustainability-2013.PDF> (accessed October 12, 2013).



ENERGY



Background: Additional Details

Fossil fuels currently dominate the energy generation profile for the local electricity grid that supplies electricity to UNMC/NM.¹ Unchecked use of fossil fuels is the antithesis of sustainability because fossil fuels are a finite resource and their extraction and combustion contribute to countless environmental and health issues.

Fossil fuel extraction includes various forms of mining and drilling that inevitably impact the landscapes and ecosystems where those activities occur. Furthermore, although coal and natural gas are currently abundant domestically, oil is not and must be imported from around the world, which requires the emission of unhealthy greenhouse gases during the lengthy transportation process.

Different types and grades of fossil fuels produce varying levels of air pollution as a result of the combustion process. Air pollution has direct health impacts that contribute to asthma, respiratory irritation, chronic bronchitis, premature death, acid rain, and ground-level ozone (which leads to smog).² Most of these effects are localized around combustion sources, such as coal-fired power plants, and particularly in urban areas dense with internal combustion engines.

Fossil fuel combustion also releases greenhouse gases into the atmosphere at

rates faster than the planet can naturally absorb those gases, which contributes to climate change. The impacts of climate change around the world include rising sea levels and generally warmer temperatures.³ As a result of climate change, the Midwestern United States, including Nebraska, will experience more extreme weather events, such as drought, storms, and heavy rain events.⁴ These will likely combine with warmer nights, an extended growing season (but one with less total rainfall and more evaporative water loss), shifting populations of historically native species, and warmer winters that create improved conditions for disease vectors such as biting insects and rodents.⁵ Consequently, the ecological disruptions of climate change will have negative impacts on the environment, public health, and the economy.

Although fossil fuels create many direct and indirect issues for human health and the environment, they will remain a part of our energy mix for the foreseeable future. The best way to mitigate these effects in the short term is to focus on energy efficiency and conservation. Doing so provides immediate benefits and reduces the challenge of eventually meeting energy needs using cleaner and safer renewable energy sources. UNMC/NM have already started to do their part in reducing their energy needs, and over the next ten years, they can take additional steps to shift their own energy supply to include renewable resources.

Previous Success

Strategic Energy Initiative

UNMC/NM embarked on a Strategic Energy Initiative in 2009 with a focus on energy efficiency measures in buildings. This initiative contained three primary objectives: 1) decrease operating expenses and increase operating revenues, 2) reduce consumption, and 3) adjust the business model. There are several actions under each objective, but the primary driver is the goal to reduce UNMC/NM's energy consumption and demand by 25 percent by 2015.

Because of the strategic initiative, UNMC/NM have completed several successful projects with a total positive cost impact of millions of dollars. In addition to starting with simple actions like standardizing expectations for temperature set points in UNMC/NM's written Energy Management Policy, three particular projects have had the greatest impact on UNMC/NM's energy consumption so far:

- Adding heat recovery chillers to the Durham Research Towers, which decreases the amount of heat released to the atmosphere and reduces the need for steam from the central utility plant. This project cost \$1.4 million and has an expected payback of three years.
- Installing new chillers at the central utility plant. This project increases the overall plant efficiency while also reducing the use of ozone-depleting

chlorofluorocarbon refrigerants. This project included switching chilled water distribution to a variable supply as well as installing new plant controls.

- Although currently in progress, the third project involves updating building control systems in the largest buildings on campus. The new system will allow for monitoring and adjusting building systems in real time and at the room level. Along with the improved controls, some outdated equipment will be upgraded, such as installing variable frequency drives on fans and pumps. This project will continue throughout all UNMC/NM buildings. The final cost will be just under \$6 million with a payback of less than three years.

Behavior Change

UNMC/NM have also made great strides with energy conservation in terms of occupant behavior. In particular, UNMC/NM'S respective green teams, each conducted a "shut off the lights" campaign and installed light switch stickers around the campus to remind individuals to turn off the lights when leaving their office or meeting rooms. In addition, UNMC/NM facilities staff and green team members initiated a curtailment campaign during the hottest days of summer by asking individuals to turn off lights, unplug office equipment when not in use, and close blinds in their offices. During the summer of 2012 (which was the hottest on record) these curtailment efforts combined with

the completion of other building efficiency projects resulted in a 20 percent lower demand for electricity compared to 2010. This peak demand reduction decreased UNMC/NM's demand charge for the following twelve months and saved UNMC/NM hundreds of thousands of dollars.

Strategies: Additional Details

Short Term

Resolve Building System Temperature Differentials

Resolve the building system temperature differentials on campus to enable building equipment to operate more efficiently and predictably. Actions to support this strategy include, but are not limited to:

- Passing all chilled water through a load before returning to a chiller.
- Eliminating de-couplers and three-way valves.
- Resolving bottlenecks at the central utility plant.

Optimize Equipment Operations

Modify and optimize equipment operations to minimize the total amount of equipment online and improve the operational sequence of the system to maximize efficiency as tested and veri-

fied. This includes integration of automated and electronic control for the entire system.

Integrate Automation Technologies

Implement automation technologies to operate equipment at its highest efficiency at all flow points. Actions may include installing:

- Variable speed primary and secondary pumps
- Variable speed condenser pumps
- Variable tower fans
- Pump flow technology to automatically adjust flow rate based on kW and differential pressure measurements

Standardize Building Controls

UNMC/NM are in the process of completing a building control system upgrade based on technology offered by Siemens. Once completed, the upgrade will enable UNMC/NM Facilities Management and Planning to monitor and adjust building systems in real time and dynamically respond to changing conditions inside and outside of the buildings.

Install a Flue Gas Economizer

Install a flue gas economizer on the main stack to capture waste heat produced by the boilers and reuse it to make hot water for the system.



Lighting Audit and Upgrade

There is a tremendous opportunity to save energy by upgrading lighting technology in applicable medical areas and in older campus buildings that have not recently been renovated. There are also areas, especially in newer buildings, that may have more lighting than needed in general and/or when sufficient daylight is present. Additionally, in some areas, outdoor lighting is on during the day, but it appears unnecessary (see Figure 13). Upgrades and changes may include items such as installing:

- More efficient lamps and light bulbs and dimming capabilities in various buildings
- Photosensors and timers for both interior lighting near windows and all exterior lighting
- Motion and occupancy sensors in classrooms, conference rooms, group study rooms, offices, and restrooms
- Light emitting diode bulbs in applicable medical areas, such as operating rooms, which save energy and improve thermal comfort of staff and patients

Improve Building Envelopes

Assessing and improving building envelope issues can help reduce cooling and heating loads. A number of actions can be considered such as limiting air infiltration, increasing insulation, and improving roof surface reflectivity.

Energy Efficiency in Information Technology

UNMC/NM operate a large amount of information technology, such as computers, printers, copiers, servers, projectors, monitors, and other equipment. All these items collectively use a substantial amount of energy, typically around 15 percent of the energy consumed by a standard office building.⁶

IT-related energy conservation actions may include:

- Implementing or activating power management software or features for computers, projectors, and monitors or displays (see Figure 13).
- Incorporating “wake on LAN” capabilities to allow computers to be shut down while allowing access for updates or virtual private network use.
- Evaluating the setup and operation of any servers or server rooms to identify and plan for opportunities to reduce energy use.
- Reducing the number of desktop printers through networking and use of multi-function machines in central locations.

Energy-Related Purchasing Criteria

Adopting energy-related purchasing criteria and selecting energy-efficient computers, office equipment, and electronic medical equipment will help significantly reduce energy use. Ideally,

UNMC/NM would encourage or require purchasing office equipment, computers, and peripherals that are registered with the Electronic Product Environmental Assessment Tool (EPEAT) or are Energy Star certified. Additionally, future purchases of diagnostic imaging equipment and other electronic medical equipment would be among the top 25th percentile for lowest energy consumption for their respective class.

Improve Fleet Efficiency

UNMC/NM are cognizant of the need for efficiency in their vehicle fleet and have started looking at options such as small diesel utility vehicles to replace larger trucks. Some additional actions that will improve fleet efficiency and reduce fleet energy use are:

- Ensuring existing fleet vehicles are well-maintained and operating as efficiently as possible.
- Identifying unused vehicle resources and looking for opportunities to downsize the fleet without impacting employee mobility.
- Upgrading to more efficient vehicle models when replacing a vehicle at the end of its useful life.
- Exploring specific opportunities to replace current vehicles with more efficient vehicles now, such as replacing vehicles used for food service deliveries with lighter, more efficient electric vehicles.

Visualizing Short Term Strategies...

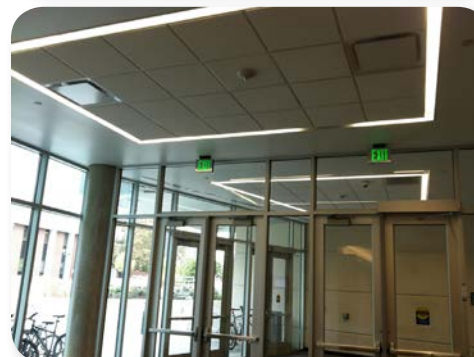
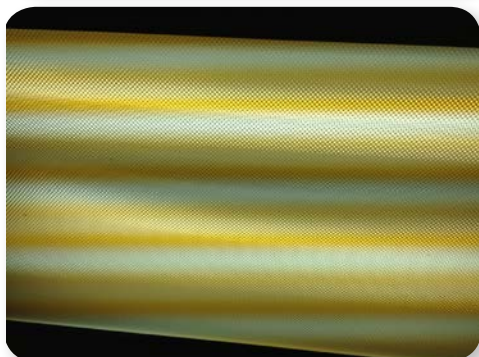
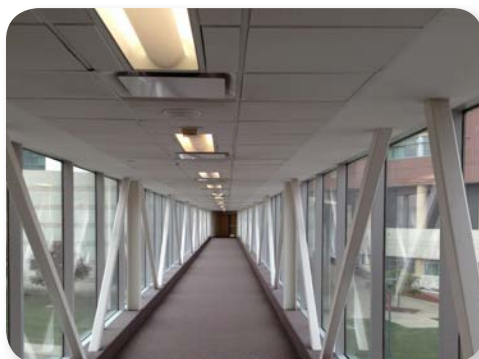
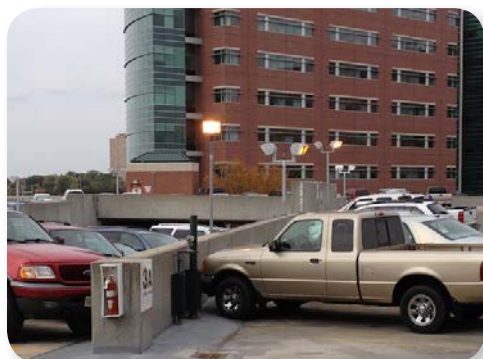
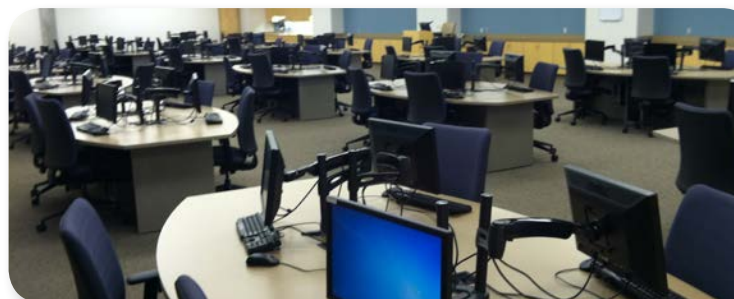
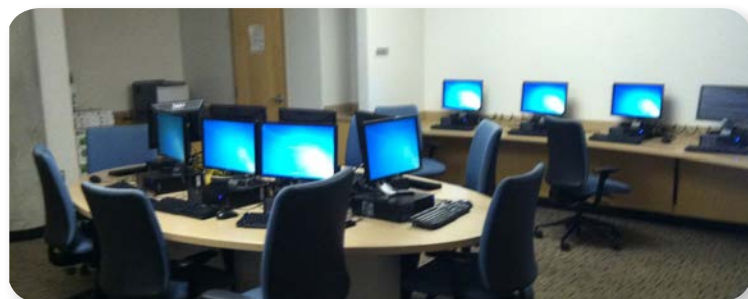


Figure 13
Lighting. There are opportunities across campus to save energy through lighting improvements. Clockwise from upper left: outdoor lights atop a parking garage are on during the day; skywalk lighting on when daylight is sufficient; waiting room lamps using inefficient incandescent bulbs rather than compact fluorescent or LED bulbs; interior space near windows using excess artificial light during daytime hours; inefficient T12-type fluorescent lamps, which are still present across campus, create a telltale artifact (red stripes) in this digital photo; indoor space between DRC I and DRC II with abundant daylight has excessive artificial light during the day.



Information Technology. The left photograph shows a computer center where nearly every monitor is on even though no one is using the computers. By contrast, most of the monitors in the right photograph appear to be turned off and not wasting energy.



Long Term

Energy Innovations

Continue to identify partnership opportunities with public and private entities to develop innovative projects on campus that help achieve UNMC/NM's energy goals and demonstrate their commitment to being an energy leader. Such innovations may include:

- Obtaining part of UNMC/NM's transportation fuel from a local biofuels producer.
- Meeting part of UNMC/NM's electricity needs with on-site renewable energy generation, including covering rooftops or parking areas with solar photovoltaics and small-scale wind generation.
- Integrating alternative fuel (such as natural gas or electric) vehicles into UNMC/NM's fleet by working with entities like Metropolitan Utilities District.
- Exploring partnership opportunities with Metro Transit to supplement or replace shuttle services.

Institutionalize a Green Revolving Fund

UNMC/NM will benefit from institutionalizing their commitment to reinvesting energy savings into efficiency projects. This will help ensure that funding for sustainability-related projects continues when leadership transitions occur.

Notes

1 The majority of Omaha Public Power District's total supply capability starts as coal, natural gas, or oil per its *Annual Report 2013*, available at http://www.oppd.com/InvestorsFinance/FinancialInformation/22_001331 (accessed March 12, 2014).

2 U.S. Environmental Protection Agency, *Effects of Air Pollutants – Health Effects*, available at <http://www.epa.gov/eo-gapti1/course422/ap7a.html> (accessed on December 2, 2012).

3 Sierra Club and Climate Recovery Partnership, *Climate Change: The Challenge of Our Time* executive summary, available at <http://www.sierraclub.org/crp/downloads/SierraClub-CRP-Executive-Summary.pdf> (accessed on December 2, 2012).

4 Presentation: Dr. Song Feng, Faculty, School of Natural Resources at University of Nebraska Lincoln, *Climate Change and Nebraska: What does our future hold?*, (October 20, 2012), Community meeting at First United Methodist Church, Omaha, Nebraska.

5 *Id.*

6 Energy Information Administration, *Office Buildings: How do they use energy and how much does it cost?*, available at http://www.eia.gov/emeu/consumption-briefs/cbecs/pbaweb/office/office_howuseenergy.htm (accessed on November 15, 2012).



WATER



Background: Additional Details

Water and sustainable sites are considered together because water is one of the most significant items to consider when evaluating the sustainability of outdoor sites. Water use encompasses water consumption in buildings and outdoors, and sustainable sites addresses the techniques for designing and maintaining outdoor space. Both areas have ties to sustainability, although in the case of site management, the connections may not be obvious at first. For UNMC/NM, water and sustainable sites are important due to the location of the 42nd & Dewey campus in the Saddle Creek watershed and because water is an important resource in Nebraska.

Site features such as rain gardens, pervious pavement, and bioswales help to retain and clean outdoor water as it percolates back into the ground, providing habitat, flood control, and improving water quality by filtering out particulates.¹

Sustainable landscaping requires less application of fertilizers and pesticides. These chemicals can be transported into buildings through air handling equipment or foot traffic, creating health hazards for patients, visitors, staff, students, and others.² Reduced lawn and landscape maintenance also creates a better healing, learning, and research environment by reducing noise³ and emissions from

equipment like lawn mowers, blowers, and vehicles used to transport people and equipment.

Water conservation is also particularly important in Nebraska. The state's agricultural industry uses significant amounts of both surface water and aquifer water for irrigation. Climate change is expected to impact Nebraska's water resources by mid century; Nebraska is expected to have much more frequent, more severe, and longer lasting droughts as a result of climate change.⁴ Water-smart landscaping on UNMC/NM's campus would make UNMC/NM better prepared to handle the increasingly frequent drought conditions expected in the coming decades.

Finally, cleaning, processing, and pumping water requires significant energy use. The nation's wastewater plants and drinking water systems spend about \$4 billion per year on energy to treat water.⁵ Therefore, using less water reduces emissions and saves energy.

Previous Success

UNMC/NM's water consumption typically peaks in the mid-to-late summer coinciding with the time of year that requires the heaviest cooling loads and the peak time for irrigating lawns and landscaping. UNMC/NM's energy conservation and construction projects have reduced the water demand for building water use, leaving irrigation and chiller/boiler use as the primary reduction opportunities.

With respect to domestic water use inside buildings, UNMC/NM have been proactively installing low-flow and low-consumption faucets and fixtures during major renovations and new construction for at least the past decade. Records show that nearly a dozen buildings on campus are now equipped with low-flow or low-consumption faucets or fixtures. However, in several locations the low-flow fixtures allowed soap residue and debris to build up in the pipes, requiring the reinstallation of regular faucet heads. UNMC/NM are exploring options to address this issue.

Energy-focused renovations at the central utility plant are helping to decrease chiller/boiler water use. For example, a reheat loop was added to capture usable heat that would otherwise be rejected through the chillers and cooling towers. Some reduction is also due to reconfiguring and upgrading valves and pumps as well as increasing overall system efficiency.

Outdoors, UNMC/NM have made progress in their landscape design to select more native and drought-tolerant plants, particularly in the new student plaza. However, most of the campus lacks these features and could benefit from an updated approach to sustainable site management.

Strategies: Additional Details

Short Term

Low-Flow Fixtures

Specify low-flow toilets and other fixtures in any new buildings or renovations. Such fixtures should meet or exceed the standards of Leadership in Energy & Environmental Design (LEED) for New Construction or Major Renovations (2009),⁶ which include:

- Commercial toilets: 1.6 gallons per flush (gpf) or lower
- Commercial urinals: 1.0 gpf or lower
- Restroom faucets: 0.5 gallons per minute (gpm) at 60 pounds per square inch (psi) or 0.25 gallons per cycle for faucets on a timer
- Showers: 2.5 gpm at 80 psi

Kitchen equipment may exceed these values, but it should be as efficient as possible while meeting the needs of food service operations.

Low-Flow Faucet Aerators

Identify and install low-flow aerators that reduce the flow rate to 0.5 gallons gpm or less, where possible (see Figure 14). The aforementioned issue regarding the build up of soap residue and debris in the pipes must be rectified before additional low-flow faucet aerators are installed or

re-installed. Paybacks for installing low-flow aerators are often less than a year.

Monitor Building Water Use

Similar to the building systems for energy, develop a method or system for periodically tracking building water use and monitoring trends in order to identify opportunities. This may also include:

- Establishing water use targets for specific buildings.
- Providing regular water use data to key users and occupants, perhaps by leveraging a kiosk or dashboard focused on energy use.
- Implementing an education and awareness campaign around water conservation similar to the campaigns focused on curtailing peak electricity use.

Landscape Management Plan

The first step to managing outdoor water use and reducing noise and pollution from landscape maintenance is to create an environmentally-sensitive Landscape Management Plan. The plan should include actions such as:

- Policies to optimize water use, such as minimizing water applications and restricting them to optimal times and weather conditions.
- Avoiding water applications on impermeable surfaces.
- Transitioning campus landscapes to

native and drought-tolerant vegetation that also provides habitat and promotes biodiversity (see Figure 14).

- Exploring future opportunities to capture and use rainwater or grey water for irrigation.
- Using low-nitrogen and low-phosphorous fertilizers that are free of pesticides.
- Increasing the use of stormwater management techniques, such as green roofs, rain gardens, bioswales, and pervious pavement.

Long Term

Pervious Pavement

Pervious pavement (i.e., pervious concrete, porous asphalt, and concrete or plastic paving stones) allows water to seep through, rather than forcing it to runoff into the sewer system. This technology is in use at a handful of large commercial locations in Omaha today, and will become more prevalent in the near future.

Second-Use Irrigation Water

Both rainwater and grey water from buildings could be used for irrigation in lieu of purchasing processed and treated water from Metropolitan Utilities District. Effective implementation of either method will likely require some advanced planning and may be best suited for an application in a new UNMC/NM building.



Visualizing Short Term Strategies...



Figure 14
Low-Flow Faucet Aerators. The faucet shown on top has no aerator installed. Faucet aerators introduce tiny air bubbles into the stream to reduce the flow and reduce splashing. Low-flow faucet aerators, shown at bottom, go even further to reduce the flow. Use of aerators is not consistent throughout UNMC/NM's buildings, but they could reduce faucet water use by 30 percent or more.

Sustainable Landscaping. Sustainable landscaping incorporates species that are native to or adaptable to the local climate. UNMC/NM have begun to incorporate more native and drought-tolerant species that echo the Nebraska prairie, primarily in the student plaza area as shown above. Over time, UNMC/NM can apply similar landscaping across campus, reducing the amount of water, fertilizer, and labor needed to maintain it.

Notes

1 United States Department of Agriculture Natural Resources Conservation Service, *Bioswales*, available at <ftp://ftp-fc.sc.egov.usda.gov/IA/news/BioswalesFS.pdf> (accessed on November 24, 2012). *See also* <http://en.wikipedia.org/wiki/Bioswale>

2 Practice Greenhealth, *Green Guide for Health Care Operations Pilot v. 2.2* 05-3 (2008).

3 Joseph, Anjali, *Sound Control for Improved Outcomes in Healthcare Settings*, The Center for Health Design Issue Paper #4 (January 2007), available at <http://www.healthdesign.org/sites/default/files/Sound%20Control.pdf> (accessed November 28, 2012).

4 Presentation: Dr. Song Feng, Faculty, School of Natural Resources at University of Nebraska Lincoln, *Climate Change and Nebraska: What does our future hold?*, (October 20, 2012), Community meeting at First United Methodist Church, Omaha, Nebraska.

5 U.S. Environmental Protection Agency, *ENERGY STAR for Wastewater Plants and Drinking Water Systems*, available at http://www.energystar.gov/index.cfm?c=water.wastewater_drinking_water (accessed November 24, 2012).

6 U.S. Green Building Council, *LEED 2009 for New Construction and Major Renovations* 23, available at https://new.usgbc.org/sites/default/files/LEED%202009%20Rating_NC-GLOBAL_07-2012_8c.pdf (accessed on November 24, 2012).



MATERIALS



Background: Additional Details

“Reduce, Reuse, Recycle” is a slogan often associated with sustainability, and for many in the general public it represents the first step toward acting in a sustainable manner. It is simple, catchy, and a good place to start. However, sustainability and the environmental issues of today have become more complex since this slogan was coined decades ago.

A more modern vision of sustainable materials management embraces the concept of manufacturing every material item as something that can be “broken down and circulated indefinitely in industrial cycles,” including products that are repairable rather than disposable.¹ Until society, and especially corporations, embrace this new paradigm, the concepts of reduce, reuse, and recycle will play an important role in reducing human damage to our natural environment.

As one considers the environmental impact of material and waste, it is important to remember there is a much greater impact than material physically taking up space in landfills. Landfills are federally regulated because they can threaten the quality of nearby ground and surface water, air quality, and soil quality.²

Landfills also release methane gas, which contributes to climate change and negatively impacts human health. Methane is an extremely potent greenhouse gas.

It is 20 times more effective at trapping heat in the atmosphere than the most well-known greenhouse gas: carbon dioxide. In the U.S., landfills are the third largest contributor of methane gas into the atmosphere, constituting around 18 percent of U.S. emissions of methane.³

Previous Success

Since starting its initial recycling program in 1989, UNMC/NM have made great strides in the area of recycling. Over the past two decades, UNMC/NM have diverted an estimated 21 million pounds of paper, cardboard, and other recyclable material from the landfill. The program has expanded over the years, and UNMC/NM currently have the ability to recycle mixed paper, cardboard, aluminum, plastic, tin, scrap metal and fluorescent tubes.

The most effective way to reduce the amount of waste and recycling that needs to be handled is to reduce the volume and quantity of materials purchased on the front end.⁴ Some departments within UNMC/NM are trying to take sustainable steps like ordering materials that result in less wasted packaging, clustering orders to reduce shipments, and ordering only what will be needed.

Strategies: Additional Details

Short Term

Paper Reduction Initiative

There is an opportunity for UNMC/NM to establish a clear expectation that paper use will be minimized through paper-reduction actions such as:

- Supporting paperless meetings through use of information technology, including providing electronic documents rather than printing.
- Where possible, set duplex printing as the default for existing printers and copiers.
- Encourage departments to coordinate with IT workstation support to set up new computers to print duplex by default.
- Encourage departments to set printing reduction goals and to work with procurement and printing services to track and monitor printing usage.
- Encourage UNMC faculty to provide course materials only in digital formats (see Figure 15).
- Utilize UNMC’s eSHOP features that reduce the need for paper forms and storage.
- Continue to expand OneChart PATIENT (electronic access to records) to all relevant medical areas and

encourage patients to access summary reports online instead of receiving printed copies.

Sustainable Procurement Policies and Practices

Include sustainability considerations in procurement practices by inquiring about vendors' sustainability practices and assigning value to product characteristics, such as life-cycle cost, environmental impact, recycled content, reduced packaging, energy efficiency, and emissions. This approach can identify products or services that meet functional needs while supporting UNMC/NM's efforts to reduce waste, reduce energy use, increase recycling, and reduce harmful chemicals in buildings. Supportive actions include the following:

- Establishing policies and procedures for investigating waste prevention opportunities in the supply chain purchasing process.
- Phasing in waste-reduction and other environmental criteria into contracts and specifications for products and services; this could also include requiring key contractors (e.g., Sodexo) to report annually on sustainability efforts and related benefits to UNMC/NM.
- Requiring contractors to recycle non-RCRA construction and demolition materials and to report estimated or actual amounts of recycling by type of material.

- Developing a list of targeted materials to avoid when purchasing new products; examples include mercury, brominated flame retardants (BFRs) polyvinyl chloride (PVC), di-2-ethylhexyl phthalate (DEHP), Bisphenol A (BPA), and volatile organic compounds (VOCs).
- Identifying and adopting sustainable procurement policy metrics to assess progress; examples include total number and percentage of products purchased with identified environmental criteria and total number and percentage of certified sustainable products purchased (GreenSeal, EcoLogo, EPEAT, etc.).

In addition, ensure that individuals and departments are aware of sustainable purchasing options by highlighting, or allowing vendors to highlight, sustainable products. Examples may include:

- Establishing a “green” product store or identifying more sustainable products with a particular icon on UNMC's eSHOP program.
- Decreasing small shipments and duplicate orders by using combined carts in eSHOP.
- Setting recycled content copier paper as the default option when purchasing paper in eSHOP.
- Working with Nebraska Medicine's primary office supplies vendor to clearly identify and promote more sustainable options.

Trash and Recycling Improvements

The outgoing materials stream of the campus was heavily studied as part of a waste reduction initiative during fiscal year 2011. Although implementation of actions from that process are ongoing, there are additional opportunities to continually improve handling of trash and recyclables on campus, including:

- Increasing the number of trash and mixed recycling receptacles at major entrances to campus buildings, near outdoor gathering areas, and indoor commons areas accessible by visitors.
- Continuing to enhance and expand the current recycling program to reach all campus areas with uniform containers and signage (see Figure 15).
- Implementing beverage container recycling in patient rooms.
- Offering recycling opportunities in all cafés.
- Continuing to evaluate opportunities to improve and expand on-campus collection opportunities for special items such as alkaline batteries, cellular phones, eyeglasses, light bulbs, and printer cartridges.
- Continuing to review and analyze the waste and recycling collection system in order to improve efficiency for Environmental Services staff and the waste and recycling haulers.



- Ensuring that all satellite locations have mixed recycling containers and collection services.

Reduce Lab-Related Trash

Research labs present many challenges and opportunities for materials management since they generate a variety of waste types and sometimes in large quantities. Opportunities to reduce the amount of trash, and increase recycling coming from research labs include:

- Increasing the use of reusable equipment and decreasing disposable equipment.
- Providing additional resources to educate researchers and research assistants on how to divert the various waste streams produced in the research labs.
- Exploring specific protocols, such as a green lab certification program, to give the laboratories specific and achievable action steps with a specific end result.

Implement Waste Reduction Strategies in Surgical Services

In a hospital setting, the Surgical Services Department typically generates the most revenue, uses the most medical supplies, and produces the most waste. Recent studies have shown that the Surgical Services Department produces approximately 20 to 30 percent of a hospital's total waste volume even though it has a rather small spatial footprint.⁵ However, there are multiple waste reduction opportunities for Nebraska Medicine's Surgical

Services Department and other medical areas known to produce high volumes of waste, including the following:

- Continuing to expand the purchase and use of reprocessed single-use devices and collect these items.
- Transitioning to using more reusable textiles and supplies, such as reusable surgical towels, gowns, patient warming devices, back table covers, mayo stand covers, basins, and grounding pads.
- Continuing to evaluate and reformulate medical procedure kits to reduce excess supplies and identifying opportunities to replace disposable items with reusable items where demonstrated safe and economically viable.
- Implementing the use of portable fluid management systems to avoid the use of disposable suction containers.
- Continuing to recycle blue sterilization wrap and evaluate the purchase and use of more rigid sterilization containers (i.e., reusable hard cases).
- Continuing to offer a recycling program for rigid plastics, paper, and cardboard, and provide periodic education for staff about appropriate separation of regulated medical waste.

Long Term

Enhancements to the Surplus Store

UNMC/NM currently have systems whereby unwanted furniture may be centrally collected and stored and, depending on its condition, redeployed within UNMC/NM. The current systems can be enhanced with a more user-friendly and robust online or intranet store intended to improve the turnover and reuse of furniture on campus.

Food Waste Diversion

In the next decade, UNMC/NM should identify a solution for diverting food waste from the landfill. Options may include providing food scraps to a local swine farmer or direct composting. Some action in this area will be necessary to reach the 2023 zero waste goal for all food service operations waste.

Visualizing Short Term Strategies...

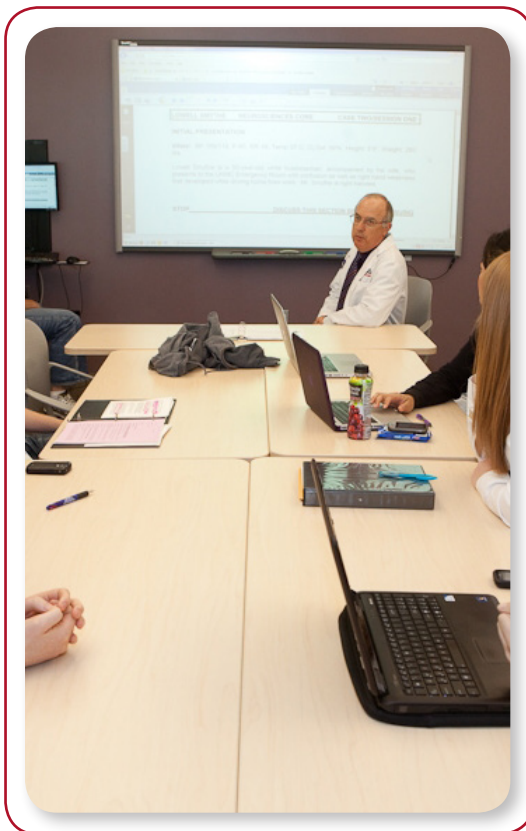
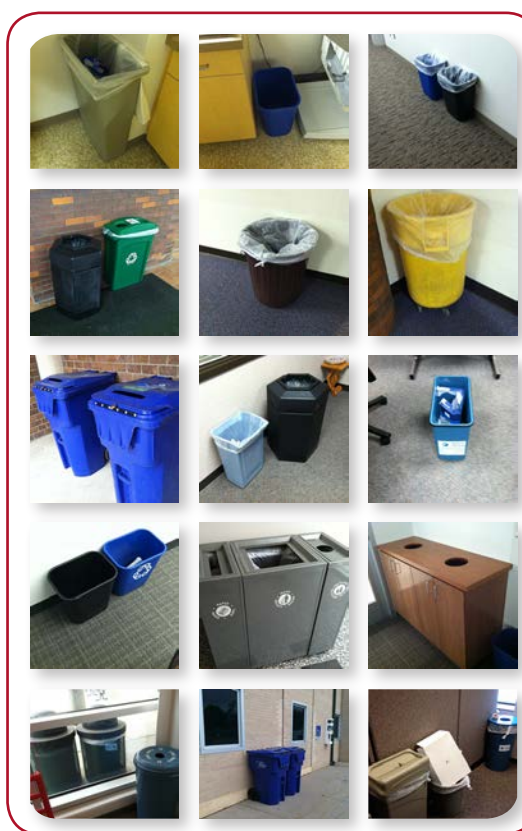


Figure 15
Paper Reduction. As individuals, especially students, become more accustomed to working with notebook computers, tablet computers, and smartphones, UNMC/NM have an opportunity to strategically reduce the amount of paper consumed on campus. As shown in the image above, the majority of students in this small group class appear to be taking notes or viewing handouts using computers rather than paper.



Trash and Recycling Improvements. Improving the logistics related to trash haulers' compactor service can reduce the amount of trash that accumulates on the docks, saving time for both Environmental Services' employees and trash haulers. In addition, increasing recycling rates will reduce the amount of trash and eventually the frequency by which compactors are pulled, making fewer trips for trucks and reducing greenhouse gas emissions.



Additional and Standard Containers. Although there is some similarity among recycling and trash containers on campus, there are several dozen different container variants when considering size, shape, and color, and there are almost as many different signs. Over 1,800 employee and student survey respondents indicated they would like to see UNMC/NM add more recycling containers on campus that are clearly marked and have consistent signage regarding what is collected.



Notes

1 McDonough, William and Braungart, Michael, *Cradle to Cradle: Remaking the Way We Make Things* 5 (2002).

2 U.S. Environmental Protection Agency, *Groundwater Monitoring Requirements: Municipal Solid Waste Landfills*, available at <http://www.epa.gov/osw/nonhaz/municipal/landfill/financial/gdwmswl.htm> (accessed on November 26, 2012).

3 U.S. Environmental Protection Agency, *Inventory of U.S. Greenhouse Gas Emissions and Sinks*, <http://epa.gov/climatechange/ghgemissions/usinventoryreport.html> (accessed on March 10, 2013).

4 U.S. Environmental Protection Agency, *Sustainable Materials Management: The Road Ahead* 16 (2009) (listing “Green Procurement” as a facet of materials management), available at <http://www.epa.gov/smm/pdf/vision2.pdf> (accessed on November 26, 2012).

5 Practice Greenhealth, *Greening the Operating Room Initiative Project Overview*, available at <http://www.practicegreenhealth.org/initiatives/greening-operating-room> (accessed on November 28, 2012).



TRANSPORTATION AND PARKING



Background: Additional Details

Abundant, free, or low-cost parking induces people to drive by lowering the cost of owning and operating a personal vehicle. Thus, more individuals choose to own and drive a personal vehicle, which has an overall negative impact on the environment and community health.

This pattern is important because if the rate of car ownership and operation remains at current levels while the Omaha metro area population surpasses 1.3 million by 2050,¹ there simply will not be enough road space or parking stalls for everyone to drive to and within midtown Omaha by 2050. Shifting trips to more sustainable modes (e.g., carpooling, public transit, bicycle) has multiple sustainability-related benefits such as:

- Decreasing the demand for costly and finite supplies of fossil fuels and keeping money within the local economy that would have otherwise been spent on fuel.
- Reducing the amount of pollution from the combustion of fossil fuels that create environmental and health hazards.
- Promoting more active modes of transportation that benefit individual health.
- Reducing time lost and emissions generated due to vehicle congestion on local streets and highways.

UNMC/NM own about 9,000 parking spaces. The fact that an estimated 15,000 people (including employees, staff, students, patients, and visitors) travel to the campus every day makes UNMC/NM uniquely situated to create positive change that will ripple throughout Omaha. In particular, UNMC/NM's policies around parking and transportation can support individual choices that are better for the environment, and therefore, better for community and individual health.

As an employer, UNMC/NM can take strategic action now to increase the rate of employees using carpools, public transit, bicycling, and flexible work options so its workforce is prepared for the impact of a growing Omaha population. Additionally, employees who use diverse transportation options can avoid the stress of driving alone in heavy or delayed traffic while commuting, which benefits the employer through higher job satisfaction, improved employee recruitment and retention, and better productivity at work.²

In addition, the benefits arising from access to diverse transportation options are increasingly attractive to a growing and influential demographic. The Frontier Group reports that Americans in the 16-to-34 age group drove 23 percent fewer miles per year in 2009 than in 2001.³ In the same time frame, the number of 14- to 34-year-olds without a license increased from 21 percent up to 26 percent.⁴ In addition, the growing preference among Generation Y not to own a car—because it leaves more time

for studies, extracurricular activities, and social media, and saves money for other local expenses—is expected to persist as Generation Y ages.⁵

UNMC/NM will remain attractive organizations for the next generation of students, researchers, physicians, and employees by actively encouraging and supporting improvement and expansion of transportation options, particularly around its 42nd & Dewey campus. UNMC/NM are uniquely positioned—both geographically and operationally—to implement sustainable practices that simultaneously address the transportation needs of a growing community and campus population while also reducing harmful impacts on community and environmental health.

Previous Success

UNMC/NM's past actions relative to transportation and parking have focused on providing space for employees, students, and visitors to store their vehicles while on campus. While this approach is consistent with recommendations from multiple sources,⁶ it means that UNMC/NM have not yet analyzed the potential benefits of more diverse transportation options and commuting programs.

In the face of anticipated growth on campus and in the region by 2050, UNMC/NM may not be able afford to continue to provide a parking space for roughly every 1.5 individu-

als. UNMC/NM can stay ahead of that growth by embracing its urban setting, and—as stated in its 2006–2015 Facilities Development Plan—taking advantage of the “opportunity to exercise thoughtful use of land and building sites, careful management of transportation, and greater emphasis on quality urban design.”

Recently, UNMC/NM have started to explore solutions beyond parking expansion alone. For example, UNMC/NM have been incorporating more bicycle parking with their newest buildings, and just recently installed bicycle tool stations at both the Durham Research Towers and the Student Life Center. By proactively supporting more diverse transportation choices, UNMC/NM will be following suit with other leading urban university and health care campuses as well as helping to improve transportation in around campus for decades to come.

Strategies: Additional Details

Short Term

Develop a Transportation Plan

Develop a Transportation Plan for the campus that integrates a vision for pedestrians, cyclists, mass transit users, and vehicles to efficiently travel to and through the campus. Currently, UNMC/NM’s parking is spread across

many small and large scattered surface lots along with several structured lots. An integrated plan considering employer-based traffic demand management, active transportation, building placement, and the consolidation of surface lots would make parking management much easier and improve the overall layout of the campus.

The Sustainability Master Plan Advisory Team expressed broad support for this action, recognizing the need to improve diverse transportation choices and options on campus. Such a plan should consider and analyze the following strategies.

Improve the Pedestrian Experience

Not everyone—whether an employee, student, or visitor—lives close enough to UNMC/NM to walk to campus. However, every person is a pedestrian at some point in his or her day whether they drove, bicycled, or used another mode of transportation to get to campus. There are a number of areas on or near campus where pedestrian-related infrastructure can be improved, which include, but are not limited to the following:

- Working with the City of Omaha to address pedestrian issues along 42nd Street, particularly at Dodge, Emile, and Leavenworth, and where Farnam crosses Saddle Creek.
- Evaluating and redesigning interior and exterior wayfinding for building occupants, particularly patients and visitors.

- Working with the City of Omaha to reduce speed limits on streets that pass through campus to make the environment safer for pedestrians and quieter for healing patients.

Promote and Support Transit Use

UNMC/NM are ideally located to support public transit use as it lies in the heart of Omaha’s midtown area. Currently, seven of Metro Transit’s 37 bus routes serve the UNMC/NM campus providing many options for employees who currently use transit.⁷ UNMC/NM can do more to encourage employees and students to use public transit by:

- Working more with Metro Transit to expand and improve service in midtown Omaha.
- Promoting Metro’s services on campus by highlighting lines that serve campus and where they go; informing people on how to ride the bus, how to use the bike racks on the bus, and the presence of “park and ride” locations; and selling passes on campus.
- Joining the Metro Partners Program and purchasing transit passes for employees at a discount with a subsidy for employees. This can be tax-deductible for applicable employers or tax-free for employees.
- Providing free transit passes for students to use for commuting to and from campus (see Figure 16).



Expand Bicycling Infrastructure

Bicycle use is growing throughout the country. In Omaha, bicycle commuting doubled over the past decade.⁸ Omaha was also designated as a bronze-level Bicycle Friendly Community by the League of American Bicyclists⁹ and launched a successful bicycle sharing system in 2011. The momentum around bicycling indicates that in the coming years more people are likely to use a bicycle for transportation. UNMC/NM can continue to play a role in supporting bicycling by:

- Improving access to and through campus for people riding bicycles, including extending the Field Club Trail across Leavenworth Street and improving the accessibility and prominence of bicycle parking.
- Creating or designating a facility that provides showers and lockers for bicyclists. This facility may also include covered bicycle parking.
- Incorporating concepts from Campus Planning Principle 2 (using building placement and streetscape design to promote active transportation), such as adding sharrows where appropriate (e.g., sections of 42nd Street and Emile Street) and supporting bike lanes on busier streets (e.g., Farnam Street); see page 73 for more details.

Provide Flexible Transportation Programs

A campus-wide, transportation-focused survey conducted in March 2012 revealed that many individuals view the loss of flexibility as limiting their transportation choices. There are actions UNMC/NM can take to overcome this barrier and increase the number of individuals who walk, bike, use mass transit, and/or carpool to commute to and from campus, such as:

- Implementing a car-sharing system on campus, such as Zipcar (see Figure 16), to allow employees and students who are on campus without a vehicle to have access to one at an hourly rate. Individuals can use the vehicle to travel to an appointment, to run an errand, to get to lunch, or to address an emergency.
- Promoting or creating an emergency-ride-home program to provide a ride home after work for employees or students who miss the last transit stop or a carpool due to unplanned overtime or off-peak shift hours.
- Implementing a bicycle sharing system (see Figure 16) on campus to afford similar flexibility as a car-sharing system. This service may also provide intra-campus transportation options and recreational opportunities as a healthy way to break up the workday.
- Encouraging managers to allow employees to either work from home or work a four-day, ten-hour per day workweek as appropriate.

Promote the Use of Sustainable Vehicles and Practices

Parking is a key consideration of any large urban organization. Although parking is very expensive to build and maintain, a certain amount of it is necessary, especially in a historically auto-dependent city like Omaha. However, there are a number of actions that can help to reduce the number of single-occupant vehicles traveling to and through campus as well as reduce the demand for parking spaces, such as:

- Providing a special permit for carpool users and designating preferred parking spaces for carpooling.
- Setting up an institutional account with a service that facilitates carpooling, such as Metro! Rideshare or Zimride.
- Designating preferred parking space throughout campus for employees, students, and visitors who use low-emission, high-efficiency vehicles, such as gasoline-electric hybrids, electric vehicles, motorcycles, and scooters.
- Creating a new fee structure for parking that is designed to reflect the true cost of parking, but also provides greater flexibility to individuals who may not be driving to campus every day or every month.
- Continue to issue more parking permits than the number of available spaces while seeking to reach a ratio of allocated to actual spaces that

Visualizing Short Term Strategies...



Figure 16
Transit Passes for Students. The UNO MavRide program provides free transit passes for up to 800 students per year. The display shown above was once full of route maps to help students navigate the Metro Transit system. Students using the MavRide program in Spring 2011 (when only 400 passes were provided) reduced driving trips to campus by 52 percent, saving an average of 129 parking spaces per day.¹⁰ UNMC/NM could explore a similar type of program for students and/or staff to alleviate parking demand and limit single-occupant vehicle trips to campus.



Bicycle Sharing. The B-Cycle bike sharing system was successfully piloted in the Aksarben Village and UNO area in 2011 and 2012. Individuals obtain a membership for a nominal fee and then have access to a bike and can return it to any station. Such a system could provide both recreation and transportation opportunities for individuals on the UNMC/NM campus and at the East Campus Corporate Pavilion (Midtown Crossing).



Car Sharing. There are several companies that provide car-sharing services. Zipcar is the most popular such service, and is already present at Creighton University (shown above), UNL, and UNO. Car sharing allows individuals to rent cars by the hour for a nominal fee in order to run errands, get to appointments, or deal with emergencies during the work day, and is an excellent complement to carpooling or commuting by walking or transit.



recognizes the benefits of other transportation options.

- Where surface lot construction is truly unavoidable, incorporating methods to reduce stormwater runoff such as pervious pavement, rain gardens, and bioswales.

Long term

Campus Transportation Center

Work with Metro Transit to create a physical space on campus to act as a hub for transportation users, particularly transit riders and bicyclists, by providing some indoor waiting space for transit users and shower and locker facilities for cyclists. Collocate the center with another community-focused use, such as restaurants, shopping, or public services (e.g., a library). For example, Metropolitan Community College incorporated a transit center at its South Omaha campus that also includes a police office and city library.

Notes

1 UNL Bureau of Business Research, *Omaha Area Projections to 2050: The 2007 Update Final Report* 41 (2007) (showing a projected population in 2050 of 1,333,243 for the 12-county area around Omaha, including 972,641 in Douglas and Sarpy Counties alone), available at <http://nlc1.nlc.state.ne.us/epubs/U2720/B037-2008.pdf> (accessed on November 15, 2012). Different and larger popula-

tion growth projections may come out of the Metropolitan Area Planning Agency's Heartland 2050 study (in progress) or from the Greater Omaha Chamber of Commerce Economic Development Strategy.

2 The Association for Commuter Transportation, *Commuter Choice Brochure 2*, available at http://www.commuterchoice.com/cc_brochure.pdf (accessed on November 8, 2012).

3 Frontier Group and U.S. PIRG Education Fund, *Transportation and the New Generation: Why Young People Are Driving Less and What It Means for Transportation Policy* 1, 2, 7, 23 (April 2012), available at http://www.uspirg.org/sites/pirg/files/reports/Transportation%20%26%20the%20New%20Generation%20vUS_0.pdf (accessed on November 15, 2012).

4 *Id.* at 11.

5 *Id.* at 14.

6 UNMC, *2006–2015 Facilities Development Plan* 37 (2006), available at http://www.unmc.edu/wwwdocs/UNMC_Dev-Plan_2006_2015.pdf (accessed November 8, 2012).

7 Metro Transit routes 2, 3, 11, 15, 55, 92, and 98 pass by or travel through the campus. See Metro Transit System Map, available at <http://www.ometro.com/bus-system-page/system-map> (accessed on November 21, 2012).

8 Soderlin, Barbara, *More Omaha Commuters Bike and Walk to Work*, Omaha World Herald (May 19, 2014) available

at http://www.omaha.com/money/blog/more-omaha-commuters-bike-and-walk-to-work/article_b2075696-e039-11e3-8bcd-001a4bcf6878.html (accessed on May 22, 2014).

9 The League of American Bicyclists, Award Database, available at <http://bike-league.org/bfa/awards> (accessed May 20, 2014).

10 UNO Student Government, *MavRide Executive Summary 2011*, available at <http://www.unomaha.edu/healthed/MavRideExecutiveSummary.pdf> (accessed on November 21, 2012).



FOOD SERVICES



Background: Additional Details

There are three distinct points in the food system that each independently affect sustainability and health:

Production, Processing, Packaging and Distribution

The world's typical methods of food production, processing, packaging and distribution are reliant on fossil fuels and other unhealthy contaminants. The average piece of food travels between 1,500 and 2,500 miles from farm to plate,¹ emitting greenhouse gases through ground, water, and air transport. According to a 2006 report from the United Nations Food and Agricultural Organization, the global food system as a whole produces nearly 40 percent of worldwide carbon emissions.² Furthermore, our food systems often require intense amounts of water and pesticides, antibiotics for meat and poultry, and can contaminate our water supply via runoff.³

Food Preparation and Consumption

What Americans eat is dramatically impacting our health. In a 2012 issue of the *Journal of Health Economics*, researchers reported that the United States is spending an additional \$190 billion a year on medicine as a result of obesity.⁴ A staggering 68 percent of the U.S. population is considered obese or overweight.⁵ The

Midwest region has the second-highest percent of adults considered obese at 29 percent.⁶

Health care facilities should be modeling safe, responsible, and nutritious eating behaviors. In contrast, many hospitals continue to serve a variety of processed and fried foods, trans fats, sugared beverages, and produce saturated with pesticides—both to their patients and to their staff.

Food Waste and Disposal

More than 20 percent of a major hospital's total waste is food waste.⁷ All of this waste must be handled, which requires great amounts of energy. It also produces methane (a particularly potent greenhouse gas) once it finds its way into the landfill.

Fortunately, there is a major movement to create healthier, more sustainable food systems and to reduce food waste on hospital campuses. Additionally, there is overwhelming support within UNMC/NM for moving toward more sustainable food service operations. Responses to the recent Sustainability Survey were very indicative of such support. They include:

- 83 percent either strongly agree or agree that they would support a transition to more sustainable food containers.
- 78 percent either strongly agree or agree that UNMC/NM should increase the healthy and sustainable food options served in the cafés.

- 32 percent of respondents indicated “healthy and sustainable food” was important to them (ranked third behind waste reduction and recycling (65 percent) and energy efficiency and conservation (61 percent)).

Clearly, staff and students understand the connection between UNMC/NM's health-oriented missions and healthy, sustainable food.

By working with their food services vendor, Sodexo, to increase the amount of healthy, sustainable and less-wasteful foods, UNMC/NM stand to benefit in the following ways:

- Serve as a model for healthy sustainable eating for their staff, students, visitors, and patients.
- A healthier workforce that has fewer workers' compensation claims, fewer sick days, and is more productive throughout the day.⁸
- A cleaner environment through the reduction of emissions associated with the production, preparation, and handling of food and related food waste.

Previous Success

Sodexo serves as UNMC/NM's primary food services vendor on campus. As a large, international company, Sodexo is committed to sustainability as evidenced by the extensive coverage of sustainability in its online materials and in its 2012 Sustainability Report.⁹ Sodexo's Fresh Inspirations program is a worthy beginning

and provides a good foundation for local improvements. Other noteworthy sustainable efforts include:

- Increased recycling in the Clarkson Café, the Nebraska Café, and both kitchens.
- Purchasing some locally-sourced foods when feasible and in-season.
- Involvement in a local community garden.
- Recycling cooking oil.
- Maintaining a small herb garden near the Nebraska Café.
- Purchasing energy- and water-efficient equipment and reducing energy use through strategic start up of kitchen equipment.
- Donating over 1,000 pounds to local food banks per year.

In early 2011, UNMC/NM analyzed the sustainability of the campus' food service operations as measured by the Green Guide for Health Care (GGHC) Operations rating system. The results of the GGHC benchmarking indicated that food service operations achieved only one of the seventeen available credits. While much has changed since the benchmark was established, there are still many available opportunities to help make food service operations more sustainable at UNMC/NM. Plus, the foundation of support by Sodexo, as well as employees and students, is solid, and there is interest and desire to build on that foundation.

Strategies: Additional Details

Short Term

Divert More Food Waste

Nearly everything coming out of the kitchen and dining areas could be recycled or fed into a biological process (e.g., composting, anaerobic digestion, or food for farm animals). If food service operations are going to achieve zero waste by the end of 2023, the most important and most complicated component of the waste profile to address is food waste.

There are several large institutions in Omaha that are interested in finding solutions to food waste. In order for a feasible solution to be identified, it is important for economies of scale to exist. A vendor interested in collecting food waste needs to have several sources in order to make it economical. As such, the first step is to convene other interested parties to discuss plans and barriers.

Healthy and Sustainable Foods Task Force

Develop a Healthy and Sustainable Foods Task Force that includes Sodexo representatives and staff and student stakeholders from UNMC/NM. The Task Force would be charged with identifying additional waste reduction opportunities in food services and identifying healthier food and beverage options. The Task Force

could also help develop a sustainable food policy or vision statement representing both organizations, which would illustrate the connection between sustainable food offerings, sustainable food operations, and UNMC/NM's health-oriented missions and commitment to improving community health.

Elimination of Styrofoam and Transition Back to Reusables

Concerns about the prevalence of polystyrene foam (i.e., Styrofoam) were frequently mentioned during interviews and survey comments (see Figure 17). The Sustainability Master Plan Advisory Team and the Graduate Student Association and Student Senate representatives recommended that elimination of polystyrene foam from food service operations be a top priority.

The initial focus should be on replacing foam takeout containers with recyclable or reusable containers. If a takeout program is preferred, UNMC/NM could work with Sodexo to develop a pilot program that incorporates the following components:

- A reusable container rental program wherein participants pay a set fee to "rent" a container.
- Upon presenting the necessary documentation, participants are served their food in the reusable takeout container.
- Once finished with their meal, the container must be returned to a café.



Visualizing Short Term Strategies...



Figure 17
Styrofoam Reduction. Staff and student interviews and responses from the Sustainability Survey revealed strong support for eliminating the use of polystyrene foam containers in the cafés. Because this material is difficult to recycle, it often ends up in the landfill. Therefore, to reach zero waste, food service operations will likely need to find reusable or recyclable alternatives for foam clamshells, plates, bowls, and cups.

Food Waste Diversion. **Top:** The recently renovated Clarkson Café has a built-in area for sorting recyclables from trash (top), which helps divert waste on the customer side. **Middle:** Kitchen staff are already diverting certain materials as well. **Bottom:** However, this trash receptacle contains recyclable and compostable materials that are currently being sent to the landfill. This will need to be addressed to achieve zero waste.

- Participants are responsible for returning the container, but a partnership with Sodexo's Environmental Services staff could be considered wherein Environmental Services collects and returns the containers.

These types of programs exist in other institutional organizations, but are not as common in health care settings. They are challenging to set up, but when done right, they reduce waste, save money, and create jobs.

In addition to considering a reusable takeout container program, UNMC/NM should work with Sodexo to evaluate other opportunities to replace disposable plates and flatware with reusable options.

Sign the Healthy Food in Health Care Pledge

Both UNMC/NM and Sodexo can join hundreds of health care organizations and food service contractors committed to sustainable food by signing Health Care Without Harm's Healthy Food in Health Care Pledge. This act will demonstrate a commitment to procuring local, nutritious, sustainably-produced food as part of a holistic approach to preventive medicine that protects patients, staff, and communities.

Food Education and Promotion

Develop and implement a Sustainable Food Education and Promotion Plan. As a large international company, Sodexo has a commitment to sustainability as demonstrated by its Fresh Inspirations

program and the multitude of other activities and accomplishments. As progress continues, there will be several possibilities for incorporating additional educational and promotional efforts (e.g., more information at the point of selection for diners, drawing the attention of diners to healthier foods, themed days focused on a sustainable food topic, etc.). Integrating these activities and educational efforts with UNMC/NM's wellness programs would also be beneficial.

Long Term

Bring Agriculture to Campus

During interviews and group discussions, staff and students consistently mentioned that hosting a community supported agriculture (CSA) drop off site and/or farmers market on campus would be desirable. These actions would give employees and students easier access to fresh fruits and vegetables. There are some liability concerns, which must be overcome, but multiple other higher education institutions and health care facilities have made such a program work. The CSA drop off site, in particular, could likely be implemented in the very short term.

Grow More Food on Campus

Continue installing herb gardens and expand into vegetable gardens. Growing food on site is one of the best ways to reduce the greenhouse footprint of the food served. The transportation emissions are eliminated when food is har-

vested on campus. Space constraints may be an issue, but through creative planning, many nontraditional spaces could be used to grow food (e.g., roof tops). Yahoo in Sarpy County successfully created an on-site corporate community garden.

Increase Local and Organic Food Sourcing

Set and work toward goals for food sourced from either local sources or is organically grown. Sodexo is already moving toward more local and organic food, but these offerings are not highlighted on menus or in cafés, and there is not an explicit goal to reach certain thresholds of either. Both are opportunities for improvement.

Notes

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CAMPUS PLANNING



Background: Additional Details

UNMC/NM occupy an important location in the heart of midtown Omaha. The campus covers over 100 acres, contains over 6,400,000 gross square feet of building space, and has an estimated workday population of almost 15,000 people.¹ In comparison to other Nebraska communities and parts of Omaha, one thing is clear: the campus is big and influential. The way that the campus develops effects the surrounding neighborhood and the City of Omaha.

This influence is not lost on UNMC/NM leadership. Numerous interviews and discussions with Sustainability Master Plan Advisory Team members and other leaders illuminated several comments acknowledging the effect UNMC/NM have on the city. Many spoke of UNMC/NM's commitment to being a positive catalyst for development on and around campus that provides benefits to the community such as:

- Appealing to students, employees, and visitors to live near campus, thereby shortening their commute, limiting emissions and pollution, and reducing demand for parking.
- Improving employee, student, and community health through increased numbers of people who are “out and about” as pedestrians, and preserving open space and critical nature and natural habitats.

- Serving as a catalyst for increased transit options and reducing barriers to increased transportation options.
- Placing a higher value on the embedded energy of existing buildings while decreasing the likelihood of urban sprawl.
- Creating stronger neighborhoods with a diverse mix of residents and housing alternatives.
- Fostering innovation by providing places for people to get together and share ideas.
- Attracting the most talented staff and students.
- Helping to reduce stress and encouraging healing while helping people forge bonds with the natural world.

The last ten years of physical growth and development have largely focused on renewing education space and replacing inadequate outpatient clinical facilities, and the vast majority of building has occurred east of 42nd Street.² In just the last five years, nearly 600,000 square feet of space has been added in six buildings, most of which are on the east end of campus.³

The University of Nebraska system committed to building according to “university sustainable design guidelines,” resulting in new LEED-certified buildings on campus. The Michael F. Sorrell Center for Health Science Education building became the first University of Nebraska system building to earn LEED certifica-

tion in 2009 (see Figure 18). The following UNMC/NM buildings have also obtained LEED certification:

- Center for Nursing Sciences (see Figure 18).
- Harold M. and Beverly Maurer Center for Public Health (see Figure 18).
- Home Instead Center for Successful Aging
- Truhlsen Eye Institute

As the emphasis of facility development shifts toward strategic research and patient care priorities, as well as ensuring adequate campus infrastructure and increasing campus operational effectiveness, UNMC/NM are now in a position to take advantage of the opportunity to create a midtown campus that provides an even better work environment for students and staff, a healthier environment for patients, and a positive and engaging force in the surrounding community.

Principles: Additional Details

This section is written at a slightly higher altitude than the others in that it offers three guiding principles that UNMC/NM may consider when making campus planning decisions. These guiding principles incorporate sustainability-related concepts, and support a vision for the campus and the surrounding neighborhood that provides adequate and appropriate density with a mix of



Figure 18

The Michael F. Sorrell Center for Health Science Education (left) opened in 2008 and was the first building in the University of Nebraska system to receive LEED certification from the U.S. Green Building Council. Consistent with UNMC/NM's Facilities Development Plan, the Sorrell Center has been a catalyst for both additional green renovation and construction on campus, and for the creation of the student plaza (see Figure 21), an inviting and dynamic public space on UNMC/NM's campus.



The College of Nursing received an addition in 2010 that was awarded a LEED certification in 2011, bringing UNMC/NM's number of LEED buildings to two. The College of Nursing addition is north of the student plaza area created alongside the Sorrell Center.



The College of Public Health was established in 2006, and by 2011 it had a new building on campus. The Harold M. and Beverly Maurer Center for Public Health is expected to become LEED certified and bring UNMC/NM's total of LEED buildings to three. The College of Public Health sits at the eastern edge of the student plaza.



uses, pedestrian-friendly design, multiple transportation alternatives, access to nature, and safety. The principles outlined below, if followed, will ensure that UNMC/NM are able to achieve that vision while implementing specific projects in their Facilities Development Plan.

More and more people want to live in an urban environment like the one that surrounds the UNMC/NM campus. Young Millennials and older Baby Boomers are particularly attracted to urban living and shorter commutes.⁴ Several students interviewed noted that they pined for more and better housing on and immediately surrounding campus so that they can walk to and from campus and get everything they need (dining, retail, necessities) in the immediate walkable area. Examples of this kind of community in Omaha can be found in Midtown Crossing and Aksarben Village, as well as the business districts of Dundee, Benson, and South 24th Street. The type of density that many are seeking presents important challenges and opportunities for UNMC/NM campus planners. As stated in the 2006–2015 Facilities Development Plan:

“The dense urban context constrains the campus and limits the Medical Center’s ability to grow in area. On the other hand, it presents an important opportunity to exercise thoughtful use of land and building sites, careful management of transportation, and greater emphasis on quality urban design.”

The way in which the campus grows, the way in which land is used, and the manner in which buildings are placed will have a profound and long-lasting impact on the neighborhood, UNMC/NM’s emissions related to employee and student commuting, and their ability to attract and retain top talent.

Principle 1: Foster a mix of building uses to improve area vibrancy

A key characteristic of a high-quality urban environment is the presence of a large amount of activity. The best way to activate a space is to provide people a variety of reasons to be there (e.g., work, shopping, dining, and socializing). Mixed-use areas create spaces that are more continuously occupied than areas devoted to a single use, and continuous occupation tends to make an area feel safer. When combined, the presence of different types of destinations placed close together and increased feelings of safety encourage people to walk from place to place,⁵ which is a healthier and more sustainable option than driving.

Connection to Sustainability

A walkable neighborhood is more sustainable because less fuel is consumed when trips by car are replaced with trips by walking. This is especially true in neighborhoods with housing as part of the mix of uses. During interviews, students and many staff members expressed

an interest in improving the housing options near campus to allow more individuals to experience a walkable, live-work-play lifestyle around campus. Mixed-use neighborhoods also make transit more practical because people can more easily link trips without cars when their destinations are closer together.

Other Benefits

Beyond being more sustainable, mixed-use areas can help foster innovation by providing places for people to get together and share ideas. In addition, a vibrant area on and around UNMC/NM’s campus will help attract the most talented staff and students.⁶ Market surveys by research and professional organizations indicate that while most Americans prefer single-family homes, a growing percent of the population desires to live in mixed-use neighborhoods that improve accessibility, walkability, and incorporate public transit.⁷

Strategies to Consider for Principle 1

The recommendations below will help UNMC/NM achieve more seamless and mutually beneficial integration with the surrounding community while offering campus occupants a variety of enticing activities.

Short Term

Develop densely along transportation corridors. Provide—and support private



developers who will provide—a dense mix of uses along major transportation corridors bordering campus, such as Leavenworth, Farnam, and Harney Streets, and Saddle Creek Road (see Figure 19).

Long Term

Build “transformable” buildings. Create buildings that can be easily transformed from one use to another, thereby meeting current and future usage needs and decreasing building demolition waste.

Create mixed-use development. Place and support the private placement of restaurants, coffee shops, and retail shops on and near campus.

Increase housing options. Create and support the private creation of more and various housing options on or near campus to give options to people who desire to live near campus, to make the area more attractive to potential residents, and to reduce the need to drive.

Principle 2: Use building placement and streetscape design to promote active transportation options

As one of Omaha’s major organizations, UNMC/NM can support use of multiple transportation options in the area. This support can be achieved politically, economically, and physically through

building placement and streetscape design. Transit thrives when origins and destinations achieve a certain level of density along its routes. Higher density, transit-oriented development (including a greater mix of uses) leads to a greater number of potential transit riders near transit stops, justifying more frequent service and better quality buses (or trains). These outcomes, in turn, attract even more riders.⁸ Of course, when transit riders arrive at their destination, they become pedestrians. Thus, any improvements to the pedestrian realm between transit stops and the rest of campus assist in promoting transit use.

Connection to Sustainability

Active transportation options provide many environmental benefits at a relatively low cost. People walking or riding bicycles to UNMC/NM are not burning fossil fuels, they are not adding to the traffic congestion on and around campus, and they do not require automobile parking spaces. Transit users provide many of the same benefits. By increasing support for transit, UNMC/NM would not only reduce their need for parking spaces while improving the health of their staff, students, and visitors; it would substantially improve the efforts toward sustainability of the entire metropolitan area while helping to provide a needed transportation option for many of the area’s residents. Finally, the campus will be safer with fewer collisions, especially vehicle-pedestrian. Moving about campus on foot will be quicker, easier, and safer.

Building Placement

Where buildings are placed in relation to each other and the street, as well as the design of the street itself, does much to influence how easy it is to move around an area by any form of transportation. Buildings placed a consistent distance from the street support wayfinding efforts by creating a visually digestible area. Additionally, consistent setbacks can produce a space that feels comfortably enclosed to pedestrians, like an outdoor room, especially when a line of buildings is located close to the street. Active first floors with many windows add to this sensation of comfort, as people feel safer when they know other people are present and can see them.

Streetscape Design

Traffic calming features on streets can also help enhance the pedestrian realm by reducing the potential for conflicts between pedestrians and automobiles, and reducing the severity of injuries when collisions do occur. Examples of traffic calming practices include curb bump outs at intersections, narrow traffic lanes, raised and marked crosswalks, parallel parking, and street trees; many are already in place in select locations on campus (see Figure 20). The practices cue drivers to slow down and raise the visibility of pedestrians. In addition, road markings for bicycles (e.g., bike lanes or sharrows) have been shown to reduce automobile speeds and increase driver awareness while providing a designated place for bicycle traffic.

Visualizing Principle 1: Creating Mixed-Use Areas



Figure 19

This aerial photograph from April 2011 looks westward across the campus. It illustrates how dominant parking has become on the south (left) and east (bottom) areas of campus. In at least a few cases, UNMC/NM's parking areas are located next to arterial roads like Leavenworth and 42nd Street. These corridors are prime areas for dynamic, mixed-use development.



Strategies to Consider for Principle 2

To encourage clean and healthy transportation options through campus planning, UNMC/NM can design their campus to make quality transit feasible and bicycling and walking feel safe and easy. The strategies below will help bring about these outcomes.

Short Term

Install additional traffic calming features. Continue installing traffic calming features on all streets in and around campus. Sections of 42nd Street and Emile Street—well-traveled streets cutting through campus—already incorporate some traffic-calming features, but these efforts should be expanded throughout campus. The overall streetscape design should be pedestrian-oriented with automobiles moving at pedestrian-friendly speeds.

Install bicycle trails and routes. Work with the City of Omaha and other local agencies and nonprofits to develop a network of bicycle trails and routes through campus, including connecting to the Field Club Trail. Install sharrows on streets such as 42nd and Emile Streets, and support bike lanes on busier streets such as Leavenworth, Farnam, and Harney Streets, and Saddle Creek Road.

Long Term

Create “street walls”. Create development with consistent and small setbacks

along all streets in and around campus and create active ground floors with plenty of windows.

Support dense and mixed uses along major corridors. Major corridors include Leavenworth and Farnam Streets and Saddle Creek Road. This type of development encourages transit development.

Advocate for transit service improvement. Advocate politically for improved regional transit service, and work with Metro Transit to provide faculty, staff, and students with transit passes.

Principle 3: Provide high-quality public spaces to encourage interaction and support healing.

Thoughtfully designed public spaces provide places for people to meet, converse, relax, and heal. Well-designed and managed public space encourages social interaction, physical activity, and local pride.⁹ Many Omahans express great pride when talking of UNMC/NM and the campus. By creating more public spaces that are welcoming not only for students, staff, and patients, but the community writ-large, UNMC/NM will improve community health, build a stronger local economy, and help reduce environmental impacts UNMC/NM’s student plaza—and skating rink specifically—is an excellent example of a forward-thinking and welcoming public space (see Figure 21).

Connections to Sustainability

In most cases, these public spaces should incorporate elements of the natural world, which are conducive to healing and general human well-being. Access to trees and other plants can help reduce stress and encourage healing¹⁰ while helping people forge bonds with the natural world. In addition, trees are great at providing shade and blocking wind or sound and creating habitat for local wildlife. Well-designed public spaces can also aid in stormwater runoff. Finally, the natural elements often found in public spaces are carbon sinks and help to clean the air.

Characteristics of a Good Public Space

There are several key characteristics that all good public spaces have. They include:

- Providing activity options for people, including abundant and varied places to sit and interact with others.¹¹
- A mixture of fixed and moveable chairs, benches, and ledges arranged to promote interaction.
- Access to breezes can be nice, but people generally favor spaces with effective wind blocks.
- Easily accessible from wherever people generally spend time, near where people eat, take breaks, or wait along a well-travelled pedestrian route.
- Quickly accessible by foot.

Visualizing Principle 2: Streetscape Design



Figure 20

The photograph to the left looks north along 42nd Street between Emile and Dewey Streets. This section of 42nd incorporates several good streetscape features including a marked crosswalk through a median that helps to calm traffic, pedestrian level lighting, and trees. The buildings on the west side of the street also have a consistent setback from the street, helping to strengthen the sense of place. By contrast, the buildings on the east side of the street (out of frame) have an irregular setback from 42nd Street.



The two images to the immediate left show a shared lane marking, or “sharrow” (top) and an accompanying street sign (above). Although bicycles may legally ride in the street in most cases, these markings signal to drivers that bicycles are encouraged to use the full lane on this specific street, making it safer for drivers and cyclists. Omaha has been installing sharrows in a few areas, including some downtown (Capital Avenue, 15th Street), midtown (Burt Street), and Pine Street in Aksarben Village.



Strategies to Consider for Principle 3

UNMC/NM can inspire campus occupants by creating more great places for people to meet and sit. The following suggestions can help UNMC/NM foster creative interactions while encouraging relaxation and healing:

Short Term

- **Create small, usable public spaces.** Create and improve small usable public spaces throughout the campus. Locate them near paths of heavy pedestrian travel, where people may stop to eat, or where they wait.
- **Supply large amounts of seating in public spaces.** Include ledges, benches, and fixed and moveable chairs. Arrange the seating so that people can face each other rather than placing a series of benches in one line.
- **Provide wind blocks and sun/shade mixture.** Provide ample wind blocks and a mixture of sun and shade in public spaces. Do not place seating in large open areas with no protection from the elements or sense of enclosure.
- **Incorporate the natural world.** Furnish public spaces with trees and other plants to encourage interaction with the natural world while providing shade, habitat, blocking wind and sound, and creating a sense of enclosure.

Other Recommended Strategies

In addition to the strategies mentioned above with each of the three guiding principles, there are additional short-term and long-term strategies related to buildings and campus planning that UNMC/NM should pursue within the next ten years.

Short Term

Incorporation into the Facilities Development Plan. The next update to the Facilities Development Plan will occur in 2016. Many of the elements of this Sustainability Master Plan should be explicitly incorporated therein.

Building deconstruction. Implement a deconstruction approach to building removal. Doing so will preserve for sale or reuse as many useful fixtures as possible and capture value from recyclable or reusable materials such as concrete, brick, wood, metals, and sheet rock. The Sustainability Master Plan Advisory Team was particularly supportive of this strategy. UNMC/NM should explore incorporating these concepts into future demolition and deconstruction agreements.

Improve the Tree Canopy. Reduce the heat island effect and impact on microclimate and biodiversity by planting native trees to improve the tree canopy on campus.

Monitor Indoor Air Quality. Indoor air quality is currently checked only when odor issues are reported. UNMC/NM

should proactively test indoor air quality in all buildings on a recurring schedule and make adjustments to ensure standards from Energy Star, LEED, and/or the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) are met.

Minimize Toxics in Buildings. Minimize the introduction of harmful toxic, carcinogenic, and persistent bioaccumulative substances via equipment and materials used in buildings, furnishings, and cleaning services. Activities can include, but are not limited to the following:

- Continuing to employ an Integrated Pest Management program that uses the least toxic products possible and only as a last resort.
- Developing a list of targeted materials to avoid when purchasing new products.
- Expanding the use of rubber flooring or other non-PVC flooring to additional medical areas, which do not require stripping and waxing.
- Using low VOC cleaning and floor care products labeled Greenseal or Ecologo in LEED certified and non-LEED buildings.
- Using microfiber mops and cleaning cloths in LEED certified and non-LEED buildings.
- Continuing to expand use of low-moisture carpet extractors.
- Transitioning to DEHP-free devices in the neonatal intensive care unit.

Visualizing Principle 3: Public Spaces



Figure 21

The student plaza area (top two images) creates a variety of interesting and inviting outdoor spaces for students, staff, and the public. Dynamic public spaces like this contribute to sustainability by promoting healthy activity, social interaction, scenery, and fresh air. In addition, the large oval provides recreational exercise in the form of public outdoor ice skating in the winter months.



This rooftop terrace sits between Clarkson Tower and the Eppley Institute. It provides outdoor access for individuals on upper floors and better scenery for building occupants looking down at what would otherwise have been an unappealing rooftop. UNMC/NM can continue to incorporate similar public spaces in and around future buildings.



- Refraining from using or purchasing products or equipment with mercury.
- Reducing or completely eliminating ethylene oxide (EtO) and glutaraldehyde from device disinfection and sterilization processes.

Long Term

Harvest daylight. Design new and renovated buildings to harvest daylight (and reduce energy use from lighting) and incorporate views for all occupants.

Install green roofs. Incorporate green roofs on new buildings and any applicable current buildings, especially for areas that are part of the patient viewshed.

Act as a neighborhood center. Consistent with developing an increasingly vibrant, mixed-used campus, position UNMC/NM to act like a neighborhood center, not just a medical center, to encourage more interaction with the Omaha community (e.g., people would eat lunch there, hold events there, a center for healthy living, etc.).

Notes

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CAMPUS ENGAGEMENT



Background: Additional Details

Research has consistently shown that organizations with engaged employees tend to demonstrate higher levels of productivity, greater profits, and significantly higher retention rates.¹ Fortunately, sustainability and corporate social responsibility have been identified as a top driver for increasing employee engagement at UNMC/NM and thus affecting these key business metrics.^{2,3} Recent studies have found that employees generally prefer to work for an organization that is environmentally responsible and takes steps beyond regulatory compliance.⁴

This is supported by the UNMC/NM Sustainability Survey in which over 90 percent of employee and student respondents indicated that it is important to them that UNMC/NM are committed to sustainability and actively try to conserve energy and resources. Furthermore, organizations that are committed to environmental stewardship and that provide opportunities to get involved with sustainability initiatives tend to be more successful at recruiting and retaining highly talented employees and recent college graduates.⁵

Beyond the aforementioned reasons, engaging and educating employees about sustainability also helps embed a sense of environmental consciousness into daily business decisions as well as larger institutional projects. Ultimately, it helps

foster an organizational culture that actively supports and is invested in the organization's sustainability goals and initiatives.

Previous Success

UNMC/NM's engagement efforts involving the topic of sustainability have primarily been coordinated by two campus green teams: UNMC LiveGreen and Nebraska Medicine's Energy Advocates Team. These volunteer teams of more than 100 total employees and students, each overseen by a leadership committee, focus on fostering an organizational culture of energy and resource conservation by engaging employees about sustainability issues and initiatives. Both teams started in roughly 2010 and have shown success in engaging students and staff through their educational efforts and by implementing initiatives that promote environmental behaviors. Some of their employee and student engagement accomplishments include:

- Developing robust, user-friendly, and frequently visited webpages with various resources related to sustainability.
- Implementing voluntary online pledge programs focused on promoting conservation behaviors in the workplace resulting in over 3,500 employee and student participants.
- Launching a "Flip the Switch" campaign encouraging people to shut off the lights in unoccupied workspaces.

- Carrying out a series of educational events during Earth Week 2011, 2012, and 2013.
- Hosting lunch and learn events for employees and students.
- Incorporating information about UNMC/NM's sustainability efforts in new employee orientation.
- Promoting energy conservation actions on select days during the summer seasons of 2011, 2012, and 2013 to avoid reaching a new daily peak usage.
- Achieving high awareness levels among UNMC/NM employees and students regarding green team efforts.

As a result of the aforementioned and other Energy Advocates Team and UNMC LiveGreen efforts, these volunteer green teams have helped UNMC/NM save thousands of dollars and prevent over 1,000 metric tons of carbon dioxide equivalent from being emitted into the atmosphere.

Strategies: Additional Details

Short Term

Establish an Office of Sustainability

The magnitude of UNMC/NM's operations warrants more resources dedicated to overseeing and coordinating sustainability efforts. In light of this, it would be very beneficial for UNMC/NM to establish an Office of Sustainability and employ a full-time Sustainability Manager who represents both organizations. This individual and his or her potential future staff would play an integral role in managing, supporting, tracking, and reporting on sustainability efforts across campus. The manager would also ideally be involved in UNMC/NM's high-level strategic planning discussions to ensure sustainability is integrated into future plans.

Create an Executive Sustainability Council

With support from the Sustainability Manager and the Office of Sustainability, an executive-level sustainability steering committee with representatives from both organizations would help fully implement the Plan, set sustainability policy, and integrate sustainability into campus operations and decision-making. The committee would ideally report to the UNMC Chancellor and executive leadership at Nebraska Medicine

Track and Communicate Progress

It is paramount that UNMC/NM regularly track and measure progress versus the stated sustainability goals, and communicate this progress to individuals across campus and the community. Providing timely and relevant feedback and clearly articulating the related financial, public health, and environmental benefits are important elements to maintaining engagement of UNMC/NM staff and students. Additionally, establishing mechanisms for staff and students to provide suggestions on how UNMC/NM can further improve their sustainability efforts will also strengthen engagement levels. Actions that support this strategy may include, but are not limited to:

- Incorporating an online dashboard on the UNMC/NM sustainability webpage that highlights and tracks progress toward UNMC/NM's sustainability goals.
- Incorporating quarterly sustainability updates at key leadership meetings (e.g., Department Administrator Roundtables, Chancellor's Council meetings, Employee Forums, Student Senate meetings, etc.).
- Producing an annual UNMC/NM sustainability report that is made available to all employees, students, and the community.
- Requesting an annual, formal update from key vendors highlighting their sustainability efforts on campus and quantifying the related impacts (e.g., Sodexo, Stericycle, SterilMed, etc.).

- Including sustainability activities and related public health benefits in Nebraska Medicine's community benefit report.
- Including regular updates in UNMC Today and The Week e-newsletters regarding UNMC/NM's efforts and progress.
- Developing a user-friendly dashboard and mobile kiosks that display building energy and resource consumption data in real-time for staff and students.
- Developing a joint, email-based program for submitting sustainability ideas and feedback that ensures anonymity while still providing the opportunity to track topics and responses (similar to Nebraska Medicine's Good Idea Program).

Integrate Sustainability into Strategic Planning

UNMC's current Strategic Plan includes an action item focused on developing a joint Sustainability Master Plan and generally commencing with implementation. Continuing to include sustainability and specifying implementation activities in subsequent versions of UNMC/NM's respective Strategic Plans would greatly benefit both organizations. Future Strategic Plans could include specific action items related to energy and water conservation, waste reduction, greenhouse gas emissions, and/or educating the public about community health benefits connected to sustainability.



Adopt a Sustainability Statement or Policy

Developing and adopting a joint, high-level sustainability statement or policy that provides a clear definition of sustainability and its connection to community health will make UNMC/NM's institutional commitment more transparent and help guide future sustainability activities in conjunction with this Plan. Currently, two other University of Nebraska campuses are in the process of approving a high-level statement or policy. To the extent practical, these collective statements or policies could synch across the university system while aligning with any unique missions or strategies of a particular campus.

Join Practice Greenhealth

Practice Greenhealth is a nonprofit membership organization and is well respected as a source for best practices regarding sustainability in the health care sector. By joining this organization and its 1,260 member health care facilities, UNMC/NM will have access to a wide variety of technical resources and support as well as resources aimed at engaging and educating staff on the topic of sustainability.

Join AASHE

The Association for the Advancement of Sustainability in Higher Education (AASHE) is a nonprofit organization that provides resources, professional development, and a network of support for its

members. Joining this organization and its 800 member institutions will also provide additional resources and support for UNMC/NM as they pursue their sustainability goals.

Formalize and Integrate Volunteer Green Teams

Presently, the Energy Advocates Team represents Nebraska Medicine and UNMC LiveGreen represents UNMC. Both of these volunteer green teams have played integral roles in helping foster a campus culture that is supportive of sustainability. In many cases, they have worked together on activities such as Earth Week and energy curtailment campaigns. Integrating these two green teams and formalizing the members' roles and team activities will help ensure that resources are used effectively, activities align with the Plan and the efforts of the proposed Executive Sustainability Council, and a culture of sustainability is institutionalized at UNMC/NM.

There are a number of opportunities to help formalize an integrated green team and support its initiatives, which primarily focus on promoting environmental behaviors and awareness, addressing operational improvements, and identifying policy changes that align with UNMC/NM's sustainability goals. Some of these opportunities include, but are not limited to the following:

- Rebranding the integrated green team to communicate a new, unified team to the campus community.

- Allocating annual funding for a green team budget.
- Establishing a partnership with UNMC/NM's Public Relations and Marketing Departments to have the Special Events division formally assist with coordination of Earth Week and other potential, large sustainability events.
- Working with Student Senate and the Graduate School Association to develop a student sustainability officer position for their respective councils and have these two representatives serve on the green team leadership committee.
- Including more clinical area representatives on the green team leadership committee as well as employees from satellite locations.
- Formalizing the role of green team leadership committee members and securing consistent and institutionalized supervisor support for employees to participate on the committee.

Expand Education and Communication Efforts

Expand education and communication efforts regarding sustainability and the connection between health and environmental stewardship. Over the past couple of years, the Energy Advocates Team and UNMC LiveGreen have shown tremendous success in educating employees and students about sustainability and

promoting various conservation efforts. In addition to continuing these efforts, actions to support this strategy may include, but are not limited to:

- Continuing to host sustainability-focused lunch and learn events for employees and students.
- Developing online training modules for employees who would like to learn more about sustainability and UNMC/NM's environmental efforts, which could possibly serve as an official departmental "green ambassador" training program.
- Implementing a monthly or quarterly online challenge series that encourages employees to engage in new environmental behaviors and provides the opportunity to track progress and related environmental benefits; this could be integrated with UNMC/NM's respective wellness programs.
- Providing two-to-four hour leadership immersion trainings on sustainability for the proposed Executive Sustainability Council, the integrated green team, and possibly other UNMC/NM leaders. It would be a simple and straightforward way to quickly ensure campus leaders have a common foundation of knowledge on the scope, purpose, and benefits of sustainability.
- Implement initiatives aimed at educating patients, visitors, and supporters about UNMC/NM's efforts and the connection between sustainability and public health.

Provide Recognition Opportunities

Identify and develop opportunities for staff, students, and departments to be recognized for sustainability-related efforts. In 2011, UNMC LiveGreen established the Green U program to recognize staff that engage in certain environmental actions. UNMC/NM can leverage and expand upon this current small-scale recognition program to further motivate and engage staff and students. In addition to the Green U, actions to support this strategy may include:

- Establishing a formal award granted on an annual basis to an employee, manager, and department that demonstrate success with regard to conservation and helping UNMC/NM reach their sustainability goals.
- Developing an online-based, workplace sustainability checklist for departments to assess efforts and receive recognition.
- Establishing a green lab certification program for research areas.
- Identifying and applying for local and regional sustainability-related awards.

Incorporate Sustainability Into Employment and Training

When a new employee or student starts working or training at UNMC/NM, it is important to introduce them to UNMC/NM's sustainability efforts and highlight related expectations and opportunities. Actions that support this strategy may include, but are not limited to:

- Incorporating a general expectation into the job descriptions for all new hires noting that employees are encouraged to support energy and resource conservation efforts.
- Including the "support of UNMC/NM's sustainability efforts" as an evaluation metric for performance appraisals related to all new hires.
- Incorporating detailed information about UNMC/NM's sustainability efforts and opportunities for involvement into new student orientation.
- Continuing to include information about UNMC/NM sustainability efforts and opportunities for involvement in new employee orientation.

Support Satellite Locations and Organizational Partners

This Plan primarily focuses on baselines, goals, and strategies directly connected to UNMC/NM's 42nd & Dewey campus. As progress is made at the 42nd & Dewey campus, it is important for UNMC/NM to expand their focus and include satellite locations and clinics by providing them with support and services to help them be more sustainable. This also includes working with key organizational partners, such as Bellevue Medical Center and Clarkson College, to help them implement strategies that will engage staff regarding sustainability and improve operations to help them reduce their environmental impact.



Conduct Community Outreach Regarding Sustainability

As important and influential organizations in the Omaha metropolitan community and the regional area, UNMC/NM have the opportunity to effectively promote sustainability off campus as well. Actions that support this strategy may include, but are not limited to:

- Establishing a formal sustainability speaker series in conjunction with the College of Public Health that is advertised and open to the local community.
- Working with local media to communicate UNMC/NM's sustainability efforts and benefits to the community.
- Sharing info on sustainability and best practices with local businesses, community groups, and schools.
- Pursuing partnership grants and identifying community partners to help fund and coordinate sustainability projects that make the local community more sustainable.
- Working with the City of Omaha and other local organizations to promote sustainability.

Long Term

Incorporate Sustainability Into Curriculum

Develop new courses related to sustainability and health and/or incorporate sustainability topics and the positive effects of sustainable practices on community health into relevant, existing courses.

Include Sustainability into Research Goals

Incorporate sustainability and the relation to community health into UNMC/NM's research goals and/or fund research in the respective schools that focus on green initiatives. This could entail partnering with the integrated green team and the proposed Executive Sustainability Council.

Integrate Sustainability Into UNMC/NM Brands

As UNMC/NM make significant, visible progress toward their sustainability goals, it would be advantageous to work with UNMC/NM's Public Relations and Marketing Departments to integrate sustainability as part of their brands so that they can position themselves as a world-renowned health sciences center that is also a leader with regard to sustainability.

Notes

1 Gallup Consulting, *Employee Engagement: What's Your Engagement Ratio?* 1–9 (2010), available at <http://www.gallup.com/strategicconsulting/employeeengagement.aspx> (accessed on November 27, 2012).

2 Towers and Perrin Global Workforce Study, *Closing the Engagement Gap: A Roadmap for Driving Superior Business Performance* 20 (2007), available at <http://www.towersperrin.com/tp/showhtml.jsp?url=global/publications/gws/index.htm&country=fra> (accessed on November 27, 2012).

3 National Environmental Education Foundation, *The Business Case for Environmental and Sustainability Employee Education* 3–13 (2010), available at www.neefusa.org/BusinessEnv/white_paper_feb2010.pdf (accessed on November 27, 2012).

4 Stika, Nicole and Council for Small Enterprise, *Sustainability Drives Recruitment and Retention* 1 (2010), available at <http://www.cosemindspring.com/Topics/Sustainability/Greening%20Your%20Business/Sustainability%20Drives%20Recruitment%20and%20Retention.aspx> (accessed on November 27, 2012).

5 *Id.*



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