

# WEST MADISON VISION COMMITTEE

FINAL REPORT

May 4, 2017

## INTRODUCTION

Urban development around the West Madison Agricultural Research Station (WMARS) is happening at a rapid rate. This fact and other closely-related changes provide the College of Agricultural and Life Sciences and stakeholders and partners unique opportunities that arise from the station's place within an evolving rural-urban interface. The proximity of the WMARS station to campus, a vibrant residential community, a growing array of businesses, University Research Park, a very cooperative partner in the City of Madison, and a world class agricultural and life sciences research institution creates opportunities and potential synergies not available at many comparable land-grant institutions. Among these are the potential to enable research from more disciplines; opportunities to increase public engagement with undergraduate and graduate students; and, new partnerships with K-12 education and citizen scientists. The College has also recently defined a set of strategic priorities that connect to a future expanded focus of the WMARS Station and other recently acquired facilities add to even bigger opportunities.

Beyond the opportunities, there are potential threats or areas that warrant careful consideration as the future of WMARS is considered. This includes greatly increased motor vehicle traffic and other impacts associated with population growth on the west side of Madison. These and other growth factors could have an impact on some types of activities and station uses. Some concerns have also been expressed that the portions of the station now used for commodity crop production (largely row crops and animal feed) are not the highest and best use of the property from an economic and planning perspective. These dynamics have called for a careful look at the future of WMARS and the development of a longer term, strategic vision for the station because of its critical importance to UW-Madison faculty, campus, and surrounding communities. In 2016, CALS Dean Kate VandenBosch recognized the need to put a long term vision and plan in place to meet this need.

### *Committee Charge*

The charge to the resulting WMARS visioning committee was given by Dean VandenBosch on May 9, 2016. The final charter that was reviewed with the committee by the Dean is in the appendix. The Dean instructed the committee to *“Create a vision and 10-year plan for WMARS that reflects the mission of the College and takes into account the changing urban/rural interface and the potential synergies with a future adjacent University Research Park 2.”*

The committee was asked to deliberate about the following major issues: “...Think broadly about activities that will serve the needs of CALS faculty, staff and students into the future and the potential to create effective synergies with research park facilities and activities. The committee should consult broadly with current users and others that the committee deems are likely to make effective use of the facilities, consistent with ARS guiding principles. Relevant external stakeholders, with interest in the mission of the station and the surrounding area, should also be consulted, as appropriate.”

The Committee Members who have worked over the last eight months were:

<b>Members</b>	<b>Department</b>	<b>Committee Role</b>
Amy Charkowski	Plant Pathology	Co-chair (for 1st half)
John Shutske	Dean's Office/BSE	Co-chair (Chair for 2nd half)
Nick Balster	Soil Science	Member
Dave Bohnhoff	Biological Systems Eng	Member
Julie Dawson	Horticulture	Member
Natalia de Leon	Agronomy	Member
Janet Hedtcke	West Madison ARS	Member
Jim LaGro	Urban & Regional Planning	Member
Erin Silva	Plant Pathology	Member
Phil Dunigan	ARS	Staff to the committee
Dwight Mueller	ARS	Ex officio
Darin Harris	Office of Quality Improvement	Facilitator

## EXECUTIVE SUMMARY WEST MADISON VISION

After seven months of meetings, deliberation, discussions, stakeholder discussions, and consideration of alternatives, the committee established these medium and long-term visions and recommendations:

- **PLANT SCIENCES RESEARCH STATION: Medium Term Vision (0 to 5 years):** The West Madison Agricultural Research Station (WMARS) should FOCUS future efforts to support and build world-class research capacity in the plant sciences. Research should leverage the College's existing strengths and core expertise, while actively engaging current and new partners including University Research Park and other closely-connected disciplines at UW-Madison.
  - **Recommendation 1:** To enable world-class Plant Science research, the committee urges major improvements to the WMARS infrastructure and facilities. These improvements must be present to meet the most basic requirements and human needs for students, staff, faculty, visitors, and others who currently use the station or who could increase their future use. To the extent that the station is leveraged as a “showcase” to engage and attract research funders, sponsors, and others who might help the station generate mission-centric revenue, these needs must be addressed:
    - Clean and accessible drinking water.
    - Adequate numbers of restrooms
    - Showers and lockers for station workers
    - Break facilities for station workers
    - Adequate workspace for researchers and support staff, including offices
    - Appropriate storage (equipment, machinery, supplies, samples, etc) and drying and processing facilities
  - **Recommendation 2:** The CALS Agricultural Research Station system as a whole must reassess the current WMARS role as a producer of animal feed for campus-based livestock and determine the optimum level of staffing needed to meet research needs. Feed production occupies 28% of the station's productive, farmable land. A better assessment of soil quality and other parameters should be conducted to determine the proportion of the acreages that pass a minimum quality requirement for research use. Related to that, and given the growing demand for research acreages, feed production should be limited to acreages dedicated to rotations with limited feed production in acreages deemed appropriate for research use.
  - **Recommendation 3:** As the mix of plant science research, feed production, and commodity production evolve, simultaneously evaluate and shift staffing and other crucial production resources. Currently, much of the station's staffing, machinery, and equipment is setup to accommodate feed and commodity production needs. The growing areas of vegetable and organic research require research-focused staff to ensure

excellence. The committee did not dive deeply into modeling and analysis of existing business plans and expense/revenue models, but we recommend this be done as a next step to accommodate shifts and focus recommended in this report. There are current barriers to future actions to increase research while diminishing cash crop and feed production, largely because each CALS ARS station must operate in a more-or-less fiscally solvent manner, independent of the other stations. Options that could be considered to replace lost WMARS feed production could include buying feed from nearby private sector sources or producing feed on other CALS land.

- **Recommendation 4:** As WMARS builds a deeper focus on plant science research, current and potential WMARS users should be engaged by the College to develop guidelines and flexible policy to help WMARS staff leaders to prioritize projects and specific types/categories of research. Even if additional land is freed up as a result of an examination of the station's role as a feed/commodity producer, resources, including land for research, will be in tight supply.
  
- **Recommendation 5:** A number of "wished for" items were identified and described by current or potential future users of the station as well as committee members. We recommend that each of these items be further described/justified, and costed-out in a prioritized, well-formatted prospectus document along with a summary of the WMARS mission and vision. This document could be shared with our UW-Foundation partners, donors, and other potential sources or brokers of funding. Items identified consistently included:
  - A commercial kitchen to support research and outreach activities
  - Additional greenhouses and controlled environment growing facilities
  - A modern, adequately-sized outreach/teaching facility with additional meeting room facilities and state-of-the-art AV systems
  
- **Additional highly desired research needs:** There are large operational needs that will require accommodation as plant science research and campus waste management expands at the station. These could be funded as grant-funded activity expands through a combination of in-directs, direct grant investments, or other revenues. They include:
  - Power units, implements, and loaders will be needed to manage compost especially for loading and turning the material. This set of equipment has a depreciation value of 10-15 yrs.
  - Impenetrable compost pad or a roofed area to help reduce runoff and leaching and improve operations and the environment.
  
- **Recommendation 6:** Safety needs and concerns must be discussed with the City of Madison to investigate and implement suitable safety improvements. Traffic safety issues were identified around high traffic interchanges. An example of one of the most risky identified was the crossing of Pleasant View (in trucks/UTVs being operated by students and other researchers) from one part of WMARS (east) to WMARS western parcels during rush hour and other busy times.

- **Recommendation 7:** The WMARS Station must be strategic in its efforts to link to existing and new research facilities and partners to optimize synergies. This includes the newly-acquired research facility from Monsanto that will be a key part of the foundation for the UW-Madison Wisconsin Crop Innovation Center. This center, only a few miles from WMARS, presents opportunities for synergies between research activities at the two locations. Other key, interconnected resources include the CALS agricultural research stations at Arlington, the OJ Noer Turfgrass Research and Education Facility, and the greenhouses and Eagle Heights fields on campus.
  
- **EDUCATION, OUTREACH AND ENGAGEMENT FOCUS: Medium Term Vision (0 to 5 years):** The station will become an attractive focal point for closely connected formal graduate and undergraduate education, outreach, Extension education, and other community engagement. The West Madison Agricultural Research Station is viewed as being underutilized for undergraduate education in the opinion of the committee and most UW employees and students interviewed, despite a close proximity to campus. Infrastructure and transportation upgrades are critical and are viewed as a current limiting factor for increased student and educational uses. Costs associated with increased use of the station for these purposes will need to be substantially offset with new revenues that cover costs including user fees, grants, gifts, and other non-base (non-GPR) resources. Examples of education, outreach and engagement activities include:
  - Connecting with CALS Experts through field days and workshops
  - Demonstrations for K-12 students of where food, feed and fuel comes from
  - Fermentation demonstrations and orchards/vineyards for production and teaching
  - Composting demonstrations
  - Water recycling demonstrations
  - Energy production demonstrations
  - Interpretive Center or museum
  - Greenhouse demonstrations
  - Other partnerships with UW-Research Park, Eagle Heights community, Arboretum, UW Extension, EPIC, and the Pope Farm
  
- **Recommendation 8 :** Because infrastructure for visitors is inadequate for hosting educational and outreach events, facilities need to be improved. These include several of the infrastructure improvements in recommendation 1 as well as specific facilities
  - Clean and accessible drinking water
  - Adequate numbers of restrooms
  - Meeting space with internet accessibility for small and large groups
  - Demonstration areas indoors including lab, greenhouse or kitchen space
  - More signage for visitors, including interpretive signs for research and demonstration plots, to reduce the burden on staff of hosting visitors
  
- **Recommendation 9:** Transportation to/from the station is also an often-cited issue especially for students who may not have the ability to drive their own vehicles to WMARS. The College should engage immediately with City of Madison officials as they plan and implement new transportation routes and bus lines to make sure WMARS is better-served as a means to increase student use and engagement. In our meetings with them, Madison officials voiced similar, complementary interests.

- **LIVING LEARNING LAB: Long Term Vision (5-10 years):** Over time, as facility and transportation options are upgraded to meet the basic needs of users, and WMARS becomes more accessible and accommodating for the core plant science research work, the committee agrees that the station will become a more inviting place to allow faculty and researchers to attract symbiotic projects and sources of grants, gifts, and other revenue. WMARS has the potential to become a living, learning lab that innovates, evaluates, and communicates cutting-edge approaches to sustainable agriculture, plant science, and urban food systems. This vision is based on a holistic, landscape ecological perspective of WMARS, addressing both the structure and function of the buildings and other built facilities, the research fields and plots, and including the Station’s relationships to the surrounding metropolitan landscape. It must be driven by research directions of the faculty and guided by College strategic priorities. Areas of potential excellence based on existing CALS capacities and strategic priorities are envisioned to include:
  - Water quality, water use efficiency, and water recycling
  - Renewable energy production and use, energy conservation
  - Controlled environment and growing season extension
  - Waste composting and recycling
  - Other sustainability issues/needs (environmental, social, and economic)
- **Recommendation 10:** The committee recommends further study of the concepts, costs, and potential long-term funding sources that might be possible to build and sustain the Living Learning Lab concept described in this section. We understand that such a concept will take time and resources to develop, and therefore recommend that such a study be incorporated into any future, detailed “master plan” exercises at the campus, College or station level.
- **LAND SALES AND REVENUE:** The committee was reluctant to recommend that any WMARS station land be sold because of the needs of plant science research and the potential growth in this area of research and science. Already, there is a shortage of research land at the station. However, the group is fully aware that infrastructure improvements recommended in this report will take significant non-base College or campus investments and sources of revenue. To that end, the committee is willing to support the strategic sale of small, carefully-identified land parcels that have high value on the land and development marketplace but that are unsuitable for research (due to slope, soil quality, etc.) and would have limited impacts on the core research mission of the WMARS station. The committee recommends that all analyses and decisions about land sales take into full consideration the much-needed and urgent infrastructure upgrades and usability of the West Madison enterprise recommended in this report as the highest priority. Again, the committee sees great potential for WMARS to remain a nationally and internationally-recognized plant science research facility and that we remain a highly viable, engaged, and attractive partner with groups like the USDA-ARS. Our desire is to see land sales consideration be done in ways that fully support the College’s plant science research mission, particularly at WMARS. Further, we emphasize that the consideration of all land sales be done in ways that connect intentionally to the interests of the current and potential future researchers working at WMARS and are considered in the context of the vision of the City of Madison and University Research Park. This will require continued and frequent conversations and communication between all partners. Land sales should only happen in a way where newly-created WMARS/private-owned land interfaces are planned in advance with care and purpose so that opportunities for plant science research in landscapes on those farm-urban interfaces are taken into account at

the beginning of the process (eg. pollinator habitats, water quality management, larger scale rain gardens, etc.).

## UW-WMARS STATION HISTORICAL & RECENT CONTEXT

In past years, a Mission Statement for the West Madison Station was developed and stated,

*“Recognizing the unique position of this facility’s close proximity to campus, the Station is to provide intensive research, instruction and outreach support for the UW-Madison, College of Agriculture and Life Sciences. The Station also is to encourage linkages between urban and rural communities by demonstrating the value of agricultural research to all citizens.”*

Further, as part of this mission definition in past planning efforts, it was determined that the West Madison Station would serve the following roles for the College of Agricultural and Life Sciences:

- To provide research support to the CALS faculty/staff for field plot research and field research at a location relatively close to the Madison Campus for those research projects that are labor intensive and need daily attention throughout the majority of the growing season.
- To provide animal feed to the campus for all research animals. This requires producing feed in cooperation with the Arlington Station.
- To provide service to CALS departments (primarily Dairy Science, Animal Sciences and Animal Health and Biomedical Sciences), School of Veterinary Medicine-Charmany Instructional Facility, Walnut Street Greenhouse, Campus Greenhouses, D.C. Smith Greenhouse, O.J. Noer Turfgrass Facility, Allen Centennial Gardens, WALSA, Daughters of Demeter and CALS student groups.

There has been little change to this original mission statement over the subsequent years.

### **Landscape & Soils**

The West Madison Station (WMARS) now consists of 570 acres of rolling prairie located on Mineral Point Road west of the city of Madison. The station is eight miles from the campus. The Station is located at the end of a morainal complex that resulted from the last advance of the glacier. Much of the station’s land is underlain by a variety of glacial materials and covered with wind blown (loess) and water-deposited silts. Soils that have been mapped on the Station are Plano, Troxel, Kegonsa and Dresden silt loam. All WMARS soils reflect the influence of prairie grasses in their development as they have deep, dark surface horizons. Some steep areas on the station have been severely eroded exposing subsoil materials. The majority of the soils fall in capability Classes II and III. Extensive conservation practices and structures were installed during the Station’s development to eliminate most of the limitations of the class III soils.

### **Surrounding Community**

The West Madison Station is situated on the far western edge of the City of Madison (pop. 248,000) and is influenced by the Town of Middleton (pop. 6,200), City of Middleton (pop. 19,000) and the Town of Verona (pop. 13,000). The portion of the station north of Mineral Point Road is bordered on the east by a cemetery and mixed residential and commercial properties. The north boundaries of the station are adjacent to residential development. There is a mix of residential property and agricultural land on the west borders of the station and the land south of the station, currently in agricultural use, has been

purchased for development of University Research Park II. The station is intersected by several high use roadways (Mineral Point Road, Pleasant View Road) and Junction Road runs along the portion of the station located south of Mineral Point Road. A large Television and Communication Tower is a dominating feature of the portion of the station south of Mineral Point Road.

### **Recent History, Trends and Growth**

Historical use through much of the 1990's was primarily agronomic with corn and small grain breeding research. Facilities were established for these programs such as buildings for machinery storage, biomass dryers, working space. Livestock feed was also produced for campus during this time period. Manure from campus livestock was handled and managed as compost at the station.

In the 2000's, the horticultural gardens were established. During this time, more vegetable research ensued, and two ARS greenhouses and the USDA pole shed were constructed. In the current decade (2010-2017), two hoop houses were built for season-extending research; 600 grape vines are established and bearing fruit; 30 acres of cropland were made available to accommodate increased interest in organic vegetable research. In 2014, Capital-Hatch investment funding was used to expand the capacity for basic fruit and vegetable processing. This included a walk-in cooler and a modest outdoor work/wash-line area that was added onto the north side of the existing USDA pole shed.

A green recycling initiative began in the late 2000s that expanded the manure composting program. Each year, 600 tons of campus organic waste is trucked to WMARS to be composted. This waste stream includes food, greenhouse and FPM ('Grounds') debris. The City of Middleton also depends on WMARS as a site to drop off leaves collected around the city each fall. This composting activities and partnerships continue to evolve as station staff learn how to reduce/eliminate contaminants and unwanted materials from incoming waste streams. One goal of all involved has been to reduce the amount of organic material diverted to landfills. In discussions with some external partners (UW-Extension and local master gardeners), the WMARS compost supply has come to be known as one of the highest quality, most convenient in this area of the county.

### **Current Station Activity and Use**

Of the 535 WMARS acres (455 owned plus 80 rented), about 310 acres/year are used directly for research or as land farmed in rotation with research plots. Currently, about 210 acres are used for livestock feed, cash crops and manure management. Much of this acreage is less suitable for crop research because the land is rocky or sloping with variable soil types, is greater distance from facilities and irrigation, is poorly accessible, or is near the 1400' tower and its cables/anchors. Another 15 acres of WMARS contains the silage and compost pads used to manage feed and wastes. There is also a small amount of wooded land on the property as well as a high capacity irrigation well, and other miscellaneous non-crop roadways, waterways, etc.

Table 1 breaks down the field crop, organic, fruit, horticultural gardens and other research in the 2015 production season. Plant breeding programs remain the largest single area of crop research at WMARS. Breeding work is performed on field and sweet corn, small grains for food and feed, carrots, beets, peppers, snap beans and squash. Currently about 70 acres are devoted to plant breeding research. Interest in organic vegetable research continues to increase. Currently, approximately 30 acres is devoted to the organic research area. This includes cover crops and field crops for organic production rotation

requirements. In addition, there is about 15 acres devoted to fruit and the display horticultural gardens.

<b>Table 1. West Madison Crop Research Breakdown for 2015 on 535a (455 owned + 80 rented).</b>								
	2015 Research acres							
<b>Farm Parcel</b>	<b>Plant Breeding</b>	<b>Organic<sup>1</sup></b>	<b>Hort &amp; Display Gardens</b>	<b>Fruit</b>	<b>Other</b>	<b>Rotated with research</b>	<b>Other activity<sup>2</sup></b>	<b>Feed/cash crop</b>
<b>H fields</b>	<b>20.5</b>	<b>16.0</b>	<b>1.5</b>	<b>0</b>	<b>4.8</b>	<b>91.4</b>	<b>3.1</b>	<b>5.9</b>
<b>P fields</b>	<b>19.7</b>	<b>0</b>	<b>2.0</b>	<b>0</b>	<b>0.0</b>	<b>33.4</b>	<b>3.5</b>	<b>31.4</b>
<b>B fields</b>	<b>9.8</b>	<b>13.9</b>	<b>7.3</b>	<b>3</b>	<b>1.0</b>	<b>28.9</b>	<b>0.3</b>	<b>42.5</b>
<b>M fields</b>	<b>14.8</b>	<b>0.0</b>	<b>0.0</b>	<b>0</b>	<b>0.0</b>	<b>31.2</b>	<b>7.6</b>	<b>61.6</b>
<b>Research Park/Noer<sup>3</sup></b>	<b>6.0</b>	<b>0.0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>6.0</b>	<b>0</b>	<b>68.0</b>
<b>Total</b>	<b>70.8</b>	<b>29.9</b>	<b>10.8</b>	<b>3.0</b>	<b>5.8</b>	<b>190.9</b>	<b>14.5</b>	<b>209.4</b>

<sup>1</sup> includes vegetable, field crops and cover crops  
<sup>2</sup> compost pads, silage pad, woodlot, Adventure Learning Program (Ropes course), irrigation well, pull track  
<sup>3</sup> 80 ac rental land

Table 2 summarizes the number of research projects and the number of campus PI's who were actively using the West Madison ARS from 2014 -2016. The average annual number of PI's from 2007-2013 was 25. The wide range of research-related activities involves over 100 students/staff/faculty from campus who visit the station to tend to their research on a daily or weekly basis. These programs rely on the station's facilities for restrooms, potable water, table space, restrooms, parking, fuel, and use and storage of equipment. As is noted in the recommendations, many of these needs are severely lacking.

<b>Table 2. Research Projects and PI's using West Madison ARS.</b>						
<b>Cropping Year</b>	<b>Field Crop Research</b>	<b>Fruit &amp; Veggie Crop Research</b>	<b>Animal Research</b>	<b>Natural Resources</b>	<b>Campus PI's</b>	<b>Total projects*</b>

<b>2014</b>	<b>26</b>	<b>9</b>			<b>23</b>	<b>25**</b>
<b>2015</b>	<b>25</b>	<b>26</b>	<b>13</b>	<b>11</b>	<b>36</b>	<b>76</b>
<b>2016</b>	<b>24</b>	<b>30</b>	<b>16</b>	<b>8</b>	<b>48</b>	<b>82</b>
<p>*Total projects includes livestock hauling, teaching, and non-crop research  ** crop researchers only (animal research not documented but similar to other years)</p>						

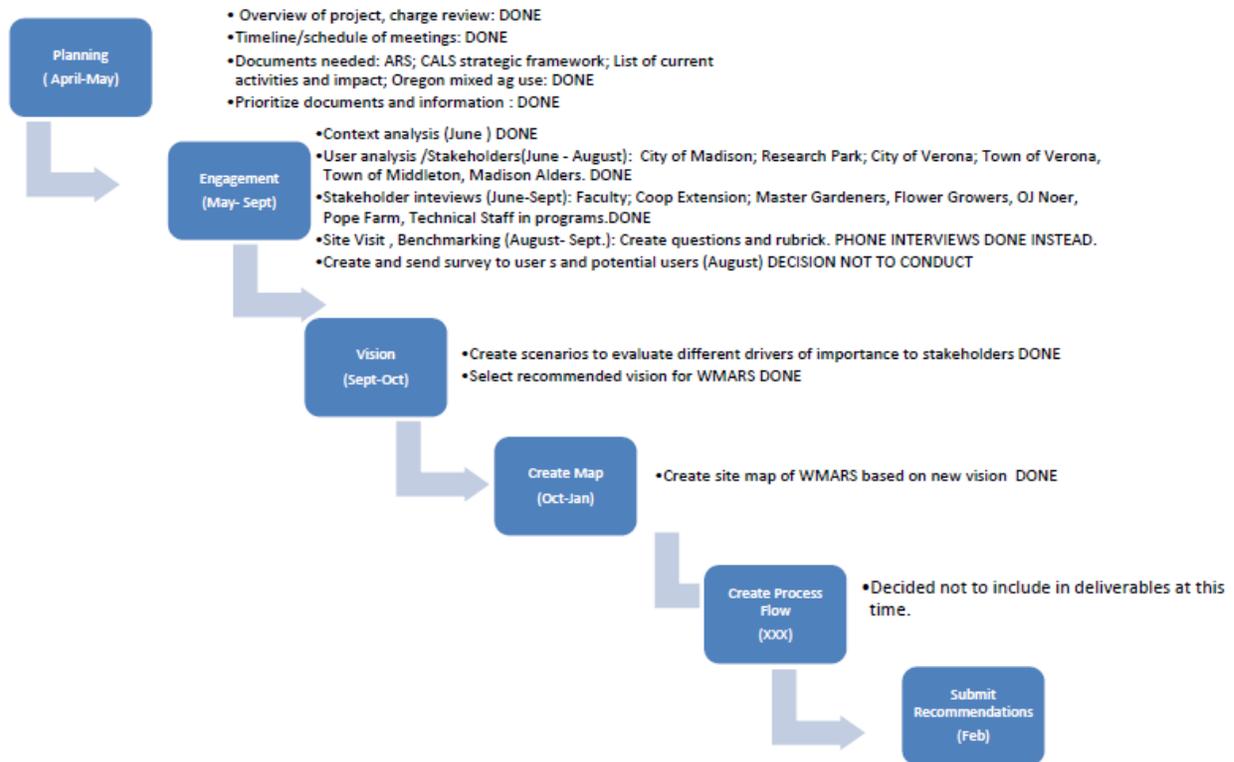
## **Public Use**

Thousands of visitors spend time at the WMARS station for field days, demonstrations, special events, private use of the conference room, or to walk through the display gardens. UW Extension's Master Gardeners use the site for participant training. Many horticultural societies rely on the station to promote their interests and activities including the Wisconsin Hardy Plant Society, The Wisconsin Day Lily Society, The Wisconsin Peony Society, the Commercial Flower Growers of Wisconsin, and The Wisconsin Grape Growers' Association. As has been noted, facilities (parking, restrooms, adequate indoor meeting space) are insufficient to accommodate groups like these especially when there may be 75 or 100 researchers and students using the station at the same time.

## **COMMITTEE PROCESS**

The committee had its first meeting that included an official charge from the Dean on April 27 and discussion of a project charter. The committee met on: April 27, May 9, June 10, July 27, September 27, October 12, November 3, and November 21, December 9. The committee created a project plan with the following elements and used this plan throughout its process. Here is a visual showing the plan and process:

### **Project Plan for W-MARS Committee (Updated 2/27/17)**



There were numerous additional meetings with stakeholders, users, and potential users of the station during this timeframe. These external meetings included two with both the City of Madison and University Research Park leadership based on their critical interests in the station’s long-term future.

Just under mid-way through the committee’s process, the committee learned that co-chair Amy Charkowski would be leaving UW. Discussions soon after looked at adding a new co-chair. The decision was made to stay with one Chair and add Erin Silva as a new committee member.

Focus in first half of process was on information gathering and learning from internal and external stakeholders. We also examined other facilities in other parts of the country. When the fall academic semester began, we started to focus in on a small set of potential scenarios based on what we had learned and the desires of stakeholders as well as committee members.

Three scenarios coalesced into one. This was shared with the Dean in an early conceptual stage in early November. Further work helped the committee to define a scenario representing a 5-10 year vision for the station. Meeting agendas can be found in the appendix.

## COMMITTEE FINDINGS

During the committee discussions and deliberations, each committee member learned a great deal about the historical context, and current work, barriers, and other issues and concerns connected to the use of

WMARS by faculty, graduate students, and other researchers. This work was also supported by conversations with faculty, staff, and graduate students (current and past users) from throughout CALS departments and programs. A summary of these internal and external conversations is summarized below. Additional significant information is contained in the appendices. In addition, minutes and agendas from each committee meeting will be kept on record and further support the below-summarized information and findings.

### **Elimination/Relocation of current activities**

#### *Animal feed production and commodity crop production for sale*

Because of the current model of each station needing to raise money for its own operating budget, it is difficult to switch the relative proportions of research, feed production and row crop production on a station in a short time frame. The committee felt that the college needs to do a more detailed examination of the budget model for the research stations as it may lead to constraints on the ability of a station superintendent to fully prioritize research. This analysis will take time, resources, and detailed economic scenario planning and modeling. It will also require engaging entities not represented on the committee such as those doing dairy and animal science research. To accommodate expanded, novel plant science research, it is recommended that detailed financial/logistical analysis be done to look at the impacts and feasibility of decreasing, or even eliminating animal feed and commodity row crop production at WMARS, and to determine the level of additional or different forms of staffing required to meet the growing research needs. The committee believes this is essential if the College wishes to increase WMARS capacity for plant science research.

Though it varies from year to year, about 210 acres have been devoted almost exclusively to crop production and manure management with the remaining acres in crop research or in rotation with crop research. These 210 acres are almost exclusively in crop production because the land is rocky, shallow, or highly sloping with variable soil types, is greater distance from facilities and irrigation, is poorly accessible, is on rental acreage, and/or is near the 1400' tower and its cables/anchors. These acres are also a place to manage manure and food wastes, which because of the heterogeneity of organic waste, most researchers don't want on their acres.

Approximately 400 (210 in feed production + areas in rotation) acres of cropland is planted to alfalfa, corn, soybeans or small grains and is used to feed the research animals housed on campus and at the Arlington research station- or sold as cash grain. WMARS produces approximately 700, 900, 40 and 35 tons of haylage, corn silage, hay, and straw respectively, for campus-based livestock. Approximately 15,000 bushels of corn are harvested and transported to the Arlington feed mill, and 7,000 bushels of soybeans are sold and used to support the WMARS operating budget. As an individual station, the production of corn silage, alfalfa, and commodity row crops is vital for the current WMARS "business plan." In addition to revenues, these acres are needed for rotation with research and land application of manure and other organic waste from campus.

While the production of feed and sale of grain at WMARS is very important financially in the current administrative structure, where each station is expected to support their own operating budget, this crop activity could be conducted at another station or these inputs could be purchased. The Arlington Ag Research Station (AARS) is most likely to meet the campus based feed needs if WMARS were to reduce their acreage of crop production. This would require careful financial and crop planning if this plan were to move forward. AARS currently rents land for its forage needs and would need to contract for additional land to achieve this goal of supplying campus base animal feed needs. It remains uncertain

what additional land around AARS would be available for leasing in the highly competitive land rental market. Furthermore, higher transportation costs of feed from AARS to campus needs to be considered as does retaining adequate land for manure (and other waste) management at WMARS because hauling manure back to AARS is highly undesirable from every aspect.

#### *Relocation of research activities to a different station such as Arlington*

In interviews done with faculty users of this station, many expressed the need to have multiple locations for their trials and Researchers clearly articulated that access to both WMARS and AARS is a critical component to successfully secure funding for field-based plant research projects and provide to provide trusted information to farmers. Variety trials and breeding work require multiple locations for testing. Many of the most relevant peer-reviewed journals require at least two and sometimes three testing environments for data publication. The ability to access at least two different field stations such as AARS and WMARS is therefore critical in order to execute plant and agricultural research in a manner that will ensure the publication of results.

Additionally, because of the huge investments in labor; it would be prohibitively expensive to relocate to another site that is more than twice the distance especially for projects needing daily attention throughout the season. While crew members living in Madison can be told to report to WMARS (as opposed to the main UW-Madison campus) to begin their work day, they would need to be provided transportation (and paid for time in transit) to Arlington. With crews of 10-20+ people in the summer (very typical for a number of the plant programs currently utilizing the WMARS facility), this represents a significant additional wage burden on research budgets.

In interviews during this committee process, researchers also stated that due to the proximity to campus, they are able to do more time-intensive, high-throughput, and riskier research, substantially improving their ability to attract funding for projects that incorporate the most current technologies applied to field research. Breeding programs require daily fieldwork through intensively monitoring flowering, pollination and evaluation of crosses. Many CALS breeding programs also have significant (20+ people) field crews. Undergraduate students are the primary source of summer field crew labor. Students and interns find the close proximity of WMARS to campus to be invaluable because they can access it by bus or bicycle and in a short time move from the downtown campus to a diverse and applied research farm. The proximity of the station to campus also allows researchers to provide more up-to-date and detailed reports to growers. For example, the fruit extension programs monitor pests and diseases at WMARS and send out bi-weekly bulletins to fruit growers in the state. They are able to transport samples quickly to campus on liquid nitrogen for analysis. This is far less feasible when using the fruit orchards at the Peninsular Agricultural Research Station in Sturgeon Bay, WI. Without the WMARS facility, Wisconsin growers would not have this information. Similar examples can be identified in other research programs.

Summarizing, stakeholders did not feel they could relocate many current activities to Arlington for three reasons: 1) Arlington is already being used (and needed as is cited above) as a second location for trials; 2) Arlington does not have adequate organic acreage for trials; and 3) Arlington is a greater distance from campus as compared to West Madison increasing both time and travel expenses.

#### **Expansion of current or new activities**

##### *Plant sciences and plant breeding research*

Plant breeding is one of the principal plant sciences activities at WMARS and current users identified a constraint in terms of the amount of land available with the proper rotations. Most researchers would be

interested in expanding their activities, were land and other infrastructure available. Stakeholder researchers identified a need for access to more research land, as current land does not meet the demand resulting from research and closely-related integrated Extension activities. As such, any short-term expansion of current research will reduce the ability to implement adequate crop rotations, which in turn reduces the quality and relevance of the research results. Most researchers expressed a need for a two to three-year rotation with research crops, depending on the project. This leads to the need of an area three times the yearly research needs for any given project. In the one or two off-years, it is possible to produce feed for livestock on campus; however, feed crops are not always the most appropriate rotation crops for each research project. As stated, the 210 acres of land devoted for crop production, 80 acres is rented, and has an uncertain future and therefore is not well suited for trials requiring long-term consistency and uniform flat or gently sloping sites. However, there may be portions of this acreage which would be suitable. A more detailed land use plan including the development of a detailed soil map would be very helpful in assessing this land and determining what acreage would be most suitable for crop research. Field boundaries could be redesigned for improved cropping efficiency while achieving conservation standards. In all likelihood, a modest number of acres are probably suitable but it would also depend on the type of research and acres needed. Small acreage trials might be well suited along with other studies such as urban runoff trials where more sloping land would be desirable.

#### *Organic research*

Researchers using the organic land stressed that the availability of organic acreage and the proximity of the station to campus are key to obtaining grants for their work. Organic vegetable trials, in particular, require daily management and large crews. In addition, many of the plant breeders doing research at WMARS stated that the organic acreage was a significant benefit because of the increasing demand for the development of varieties in organic systems. Vegetable and organic research have grown in tandem at WMARS and represents a significant change to station activities to keep up with current research trends, stakeholder needs and funding opportunities. The organic acreage is seen as an asset that will grow over time, with land improving after the initial transition time and many programs currently using that acreage wanting to expand. Rigorous organic research also depends on rotations that are representative of grower practices, making it necessary to have staff expertise in organic practices, and adequate land for rotations. The need for more support for station personnel was also brought up specifically in the context of organic and vegetable management, as the station is not adequately staffed for the demands associated with vegetable research, especially under organic production conditions.

#### *Fruit and perennial research*

Fruit researchers need land maintained in perennial orchards or vineyards, as research projects are often only possible once a planting is established. They would like a fee structure that allows them to pay a bit more on research grants using the orchard or vineyard in exchange for maintenance of such infrastructure through years when they do not have a funded project, as these 'gap' years, even though infrequent, can put future projects at risk if station staff decide to eliminate perennial plantings or they are not adequately maintained. Currently, the only research-quality planting is the vineyard, and researchers felt that many other fruit crops could use similar investments in infrastructure; however, no opportunity exists for such development in such perennial crops at WMARS without more stable long-term funding mechanisms.

#### *Non-land based constraints to expanding research activities*

The available space and infrastructure for post-harvest research activities once crops come off of the field is limiting in many aspects. Adequate space for preparation, post-harvest data collection and sample, material and supply storage is a major constraint. Limited access to reliable drying facilities and long-

term storage also constrains research across the board. The need for upgraded dryers was expressed by multiple researchers who stated that samples are not being processed in a timely way due to the inefficient machinery, leading to reduced quality of the samples processed, or delayed harvest because of the lack of available space for drying harvested crops. Similarly, access to cold rooms at different temperatures for fresh vegetables and fruits would be a very relevant upgrade to the current facility. Researchers without access to workspace often perform work outdoors on temporary tables or truck beds, which may compromise the quality of the research, as wind can result in leveling problems which can negatively impact scale accuracy. In addition to the lack of work space, there is very limited storage, particularly for medium and large equipment. This has resulted in expensive repairs due to subpar storage conditions. These costs are absorbed by researchers, which means that funding is diverted from other research needs. Investments in infrastructure should include restrooms and drinking water, a lunch room, and a place for the public to gather during field days; work space for horticultural needs (vegetable curing areas, storage areas, work areas for processing data), and commercial kitchen facilities for post-harvest fruit and vegetable research.

### *Other research activities*

The expansion of current or new activities for horticultural, field crop or other research would depend on the space and labor requirements to carry out this research. With the Wisconsin Crop Innovation Center located so closely, new activities could emerge including greenhouse waste management and increased land needs for transgenic-based plant research. The Green Initiative program at WMARS to manage organic wastes continues to strengthen as reducing organic material in landfills becomes a priority for sustainable land use. Campus is improving education about differences in recycling, composting, or landfilling wastes. As more science is invested in soil health, local food production, and climate change, composting will only become more important, from mitigating weather extremes on crop production to reducing odors near residences/urban centers.

Almost all the researchers interviewed saw WMARS as having higher potential for outreach and stakeholder engagement. Many researchers are already involved in industry-specific field days over the summer, and stated that if facilities (restrooms with showers and locker rooms, meeting rooms, drinking water, commercial kitchen, among others) and transportation were more adequate, the station has the potential to become a state-of-the-art agricultural research, teaching and outreach facility to serve industry supporters not only in the field of agriculture but also health, information technology and nutritional sciences.

### **Staffing needs**

Management of the station that transparently balances research needs with other station commitments improves the ability of researchers to plan ahead and utilize resources in a more efficient manner. It is very helpful to have a creative problem solving superintendent who strives to accommodate their evolving needs. It is also very helpful to have someone on the station with a strong expertise in organic production systems.

Organic vegetable, fruit and other horticultural (ornamental, hoopouses, and vegetable) projects, often

measured in units of square feet or number of plants, are labor intensive because each plant is handled individually and production tasks aren't likely to be mechanized. These projects have increased at WMARS in recent years due to increasing numbers of researchers working in these systems, increasing demand from the farming community and increasing grant funding opportunities. Concerns remain about the station's ability to provide labor to manage more of these labor-intensive horticultural research projects. The nature of the hoophouse research means adding 6 weeks before and after the standard growing season to manage the structure and crops inside, a time when student labor is less available.

Most in-season vegetable plot management is currently provided by research-grant-funded student crews. Viticulture at West Madison comprises 600 vines on one acre of land space. This acre is actually four distinct tracks of land and includes a range of treatments and varieties that vary in growth stages and management. Dormant pruning of grapevines adds more field tasks in February and March. To maintain these 600 vines in season, 3 graduate students, each with a student hourly assistant are on hand during May, June and July 3x weekly to provide vine handling attention during rapid shoot growth for proper canopy management. Harvest season of grapes can last 6 weeks and direct marketing of over a dozen grape varieties is another intensive aspect to the system. Handling perishable produce at harvest, which can last for months, is done tote-by-tote and requires a tremendous amount of time, labor and coordination to deliver to the end users. Storage of these perishable foods is another layer of management that the station is not staffed to handle. Five interns are needed each summer to manage the gardens and assist horticultural researchers with large, laborious jobs such as planting, mulching, hand weeding, training, pruning, and harvesting. These interns provide additional support to the core research crews of graduate students, staff, and student hourlies that can range from 3 to 6 people per research team. Additionally, permanent station staff are utilized in various aspects to assist the research teams. They support research programs in countless ways some of which includes tillage and seedbed preparation, dormant pruning, manure and composting management, nutrient and pesticide mixing and application, tank, gun and drip irrigation and other irrigation-related services. They maintain and provide utility tractors/vehicles and small engine equipment and provide training and troubleshooting on them throughout the season. Plant trellis assembly/installation and maintenance, hoophouse construction and structural repairs, maintenance of pumps, scouting, frequent mowing to maintain borders, establishment of cover crops are also done on a regular basis. Less frequent but important services the permanent staff provide to researchers include wheel spacing adjustments on large tractors, fabrication of unique equipment, and urgent repair service.

# APPENDICES

**Key findings from University Research Park, City of Madison Officials, UW-Extension in Dane County, Master Gardener Volunteers and Commercial Flower Growers of Wisconsin**

**University Research Park (URP)**

URP leaders have obvious interests as partners and stakeholders and will pursue opportunities with us as partners on any changes moving forward on West Madison.

URP maintains the lease agreements on the large TV/multi-use tower on the land south of mineral point. On the tower:

- A new ten-year lease recently signed.
- All tenants who “lease” access to the tower have options to renew at the end of these next ten years for another ten (meaning that this zone is tied up for at least 20 years)
- Safety regulations and codes do not allow BUILDING within a 1,000 foot radius of the tower.
- Even outside that zone, there are safety concerns connected to ice blowing off guy wires.

University Research Park will start their development from the south border of their property, likely just north of the traffic circle at Junction Road, Pleasant View, and Valley View Road.

If there was to be development on the Mandt Farm, south of Mineral Point, the most attractive and highest valued parcel would likely be the NE corner (Mineral Point Road. and Junction Road). If that area was ever developed, URP would prefer to see a mixed use space to attract professionals who would then be attracted to working at URP future facilities. Walkability was emphasized. Examples that were used included: Hilldale; Sequoia; or, The Commons in Brookfield.

Plans and platted, potential roadways and development sketches were shared. These are conceptual only. One detail that initially created interest is a platted extension of Watts Road across M and through the Mandt Farm’s south end. There are no immediate plans, funding, etc. for this to occur. The map shows the Watts Road extension curving to the south to accommodate the needed safety radius because of the tower.

Specific use ideas for WMARS property expressed by URP included: Center for urban ag education, visitors center, farmers’ market, and/or community center.

## **City of Madison**

City of Madison staff included: Brian Grady and Matt Mikolajewski. The city is pleased with having CALS as a neighbor with such a large agricultural use presence with the station, yet they are also quite open to discussions, new partnerships and novel uses we might propose. There is recognition by many that areas adjoining and surrounding the station are places in which continued growth and development will continue to occur at similar rates.

Brian Gady shared conceptual plans that had been developed for the property in the mid to late 1990s. Within these conceptual sketches and planning documents, about 75% of the property around the station, north of Mineral Point Road, is shown as residential development. This is already occurring in adjacent areas not owned by the University. Several large parks and some commercial use are also shown on their conceptual development map. Future vision articulated by City of Madison planners is similar to the vision by URP if any portions of land are to be developed. That is, multi-use including bike paths, public transportation, and walking trails.

To the extent that we keep property “as is” for research uses, we do need to recognize that development around the station will impact city-station interface, primarily through the interface with roads and traffic as well as further trail development. Regardless of what happens, in the future, planners will continue to characterize the station as “green space.”

Madison staff stressed that they very much want to stay engaged in conversations with CALS. Development and growth of Madison is dynamic, and more communication is always better with the City (and with URP). We were also advised longer term, as any specific plans take shape, to spend time visiting with various neighborhood associations as stakeholders and those who will want to be part of a longer term, shared vision.

On transportation, The City of Madison Rapid Bus Transit future, long-term plan has routes that extend from West Towne out Mineral Point Road, down Pleasant View Road to Watts Road, and then back. This would run immediately in front of the station. We need to stay apprised of this, since it would have positive impacts for our students and other users.

Generally, when pressed a little bit for specifics, the Madison folks indicated the value of the West Madison Station property likely ranges from \$80,000 to \$100,000 acre, but might be as high as \$125,000 per acre from a developer interested in mixed-use development.

The immediate Mineral Point Road frontage might be as high as \$200,000 per acre.

To summarize, both the City and URP are critical and highly supportive partners. Continued conversation and communication with them is crucial for both the near-term and longer term future.

## **UW-Extension in Dane County**

John Shutske met at the Dane County UW-Extension Office on November 22, 2017 9 am with three educators in the Dane County Extension office. They were:

- Claire Strader, Small-Scale and Organic Produce Educator
- Lisa Johnson, Horticulture Educator
- Heidi Johnson, Crops & Soils Agent

We talked about current use and their vision for the future using previously developed questions for engagement.

As a crops and soils agent and faculty member, Heidi Johnson uses the station extensively in summer for a 24-hour certification class for safe tractor and machinery operation for 25-27 students. Heidi noted that the west side serves Dane County ag audiences. In the case of educational programs, there is plenty of equipment and the university also carries the necessary insurance that school and private sector does not have. Heidi is interested to explore more potential for collaborative research with CALS faculty. Heidi has a PhD and mentioned possibilities of doing much more cover crop work at West Madison. She now works heavily with the Dane County parks department and the county's soil and land conservation unit, and she noted that they currently cash rent farmland often in cooperation with local farmers.

It was noted in this conversation that Dane County currently owns several hundred acres of prime farmland. They cash rent farmable land, and in our discussions, it was suggested that Dane County COULD be a possible resource for the university if additional land is needed in the future for production. The contacts at Dane County to explore further are Laura Hicklin and Kevin Connors.

As we spoke of collaborative research opportunities, Heidi and Claire had questions about the cost of using WMARS land for research. They currently pay farmers stipends for the use of private lands land - generally \$500 to \$750 for small parcels. Claire spoke of past field days and meetings at WMARS, citing the convenience of the facility, but also noting that there were limitations for medium to larger sized groups.

The three Extension staff and I (as well as the Master Gardener volunteers) had quite a lengthy conversation about compost. Dane county ceased making and selling compost in the past, and what they did sell had lots of trash in it. Comparatively, WMARS has excellent quality compost and it's reasonably priced, and they deliver. This was viewed as a strategic opportunity to engage the public in positive ways, perhaps while also serving as a significant revenue generator.

In summary, UWEX staff locally are interested in continuing to use the station and increasing partnerships and usage. To that end, they want more info on costs. For both Claire and Heidi as researchers, controlled research within a university setting is generally better than with farmers because of the need for control.

There was discussion about the need for expanding vegetable research (by local Extension people, CALS, and more broadly). There is interest in the potential for even greater cooperation with CIAS and Julie

Dawson (they already are working a lot with Julie). Claire is interested in collaborating on research involving “closed loop” farming systems.

As a horticulture educator, Lisa indicated that she had previously used the WMARS headquarters building relatively often for Master Gardener Volunteer training. She specifically referenced past grafting workshops and using the old orchard (on the Mandt Farm) to safely teach pruning. She mentioned that it would be nice to have grapes to “safely” prune. (Safely prune was used as a term meaning that learners could practice without risk of destroying or harming plants like apple trees and grapevines). Lisa said the fruit research is highly valued by the community in Dane County. Right now grapes and wine are on a lot of people’s radar screens, representing a potential strategic opportunity for the University both for research and engagement.

Lisa indicated that “The station is important and near and dear for the Master Gardener Volunteers.” There is tremendous value in summer specialist/faculty walkabouts (like insects and pests). Garden tours are valued. Teaching gardens are nice, but in need of signage, etc. Flower gardens, trials, and private sector “demos” of new flower varieties are appreciated. Lisa expressed concern citing a belief that if a MGV training is scheduled in the facility and suddenly a CALS faculty wants it, the MGV program can get bumped last minute.

For Claire and Heidi as we returned to the research side, the discussion got them thinking - potential future access and partnerships with the station and equipment opens up possibilities. They spoke of specific equipment used and accessible on the WMARS station (like a roller/crimper) that they were not able to use on a private farm.

As we wrapped with UWEX staff, they got excited. Ideas that arose were:

- Passive solar greenhouses -- including design, utilization, management
- Vermiculture
- High tunnels
- Aquaculture and other “indoor, closed loop” systems
- High intensity production + economic research and demos
- Teaching space for small scale, beginning farmers

## Master Gardener Volunteers

The second hour of discussions with the UWEX office included Lisa Johnson as Horticulture educator and three accomplished Master Gardener Volunteers (MGV). Each knew the station well. They were:

- Arthur A. De Smet -- retired professor in radiology
- Deb Pienkowski -- recently retired marketing and PR with GE
- Aleta Murray -- retired from educational administration in WI Tech College system

The three were extremely enthusiastic and seemed happy to be asked to contribute to the conversations. We followed the format of past questions with external stakeholders. (Tell us about your current relationships with WMARS; In the future, ideally how would WMARS connect to your organization or personal interests?)

The group clearly wanted to state how important the station is with UW constituents that also include community members; homeowners; and, people with special needs like “seed testing.” On recent activities, there was a lengthy discussion on flower performance trials and demonstrations of new flower varieties.

MGVs have volunteered on the research side with station staff and with CALS. Aleta talked of a grant that examined the spread of powdery mildew, requiring daily observations and data collection. One of the MGVs traveled to the station often and directly supported Judy Reith-Rozelle (former WMARS Assistant Superintendent) on this project. All felt that MGVs could be better leveraged if approached in an organized, meaningful way.

The group spent a large portion of the discussion talking about the need for marketing, PR, and advertising for WMARS. They reminded us that most people in Madison know nothing about WMARS. To achieve more publicity, support, recognition and even funding, there was discussion of new models for engaging people. One idea was “Memberships.” That is sell packages that include special access, lectures, and talks involving knowledgeable speakers.

The group reminded me that because of cuts and reductions, MGVs have filled some voids. As an example, Deb did a great deal of work to help with PR and marketing to assist with the Horticulture Field Day in 2016.

Some other things talked about: Horticulture Field Day and “Cut and Dig” - Both, extremely valuable, but not at all well known. They emphasized “the community MUST get involved or it will be tough to justify the station in the coming decade.” They also talked about how other entities are leveraging OUR station for PR - most notably the Alumni Association that did a summer tour using WMARS. Other discussions about assets that we could leverage included wine, art, etc.

The group really hammered on this need to make the station and its benefits clearly visible to the public. They said “MGVs will help throughout the state with PR, but they need a PR leader to guide efforts.”

Again, they cited how the Alumni Association bussed people all the way up to the CALS Hancock station for summer visit, and charged 50 people \$40 each for a day-long trip. Obviously, they suggested strongly that we look at how Alumni Association is leveraging stations statewide.

Like with UWEX, there was more compost discussion. At WMARS, it's cheap and potentially a good revenue source. There's a huge need for compost within the community including with local vegetable growers and community gardens.

The group had interest in talking about the station being (or seeming to be) short staffed. They were clear to note that Janet does a huge amount of great work and is an excellent manager of WMARS logistics, operations, etc. They felt there was a big opportunity to do more outreach, PR, TV, advertising, radio etc. There was a sense that WMARS is the perfect summer venue to promote CALS, educate the public, and create recognition and goodwill for the university. To this end, I mentioned the potential for a partnership that would actually be a constellation of venues to work together including Pope Farm, WMARS, and even the Arboretum. There was lots of excitement. They thought we should figure out a niche like the Pope Farm's sunflowers. With respect to current gardens, facilities, etc. they said, "Do more with what you have. Fill boxes and spaces with plants and flowers. Include better QR codes and signage." This could also support and even be a revenue generator if partnerships included working with photographers, wine events, chefs, and seed-to-table. They concluded, "Focus on the tie to education that engages community members, and then capture that value through revenue and giving."

### **Commercial Flower Growers of Wisconsin**

John Esser, executive secretary for Commercial Flower Growers of Wisconsin has been connected to the West Madison display gardens for over a decade. He says 'The ability of greenhouse owners and growers as well as consumers to see new varieties compared to existing varieties growing side by side is helpful in their decision making. That is the goal written in the Commercial Flower Growers of Wisconsin charter over 60 years ago, to provide a continuing education to Wisconsin greenhouses owners and growers. More extensive trials, growing many more plant varieties including containers would be a big help to Wisconsin's greenhouse industry. Maintaining this facility as an All America Selections trial ground for both vegetable and flowering plants would help both commercial businesses as well as the consumer'.

## **WMARS COMPARABLE FACILITIES REVIEW RESULTS**

Committee members solicited information from other comparable university agricultural research stations. Responses were received from Missouri University's Bradford Research Center, Montana State University Western Ag Research Center, Virginia Tech Hampton Roads Agricultural Research and Extension Center, Iowa State Horticulture Research Station near Ames, Oklahoma State University Botanic Garden and Texas A&M Agri-Life Research and Extension Center at Dallas, TX. A series of questions was asked (see below) and solicited the following common attributes:

- The facility is located close to a main university campus and is viewed as an important resource to the campus research and instruction programs.
- The Primary Mission of the facility is to support research. There is direct researcher involvement in the programs conducted on the station and a small "core" station staff that provides basic support to researchers. In some instances, the researchers have their main office and laboratories located on the station.
- Research and demonstration programs tend to be plant focused, but there is typically an urban focus that includes water quality and management, storm water and waste water management, environmental issues, organic crops, recycling or composting. Often a botanical garden or turf area is a highlight of the station.
- A Secondary Mission is to provide community outreach and education programs, including student instruction. These public outreach and education programs are conducted by persons or groups other than the station's "core" staff.
- Funding comes from a variety of sources including base college support, Hatch funding, research grants, Extension funding, fee-based program revenue (outreach and public programs), external partnerships with municipalities and industry, and private endowments.

Direct interviews of several of the stations were conducted. A more detailed report of these interviews is included below.

### **INTERVIEW QUESTIONS – WMARS COMPARABLE FACILITIES**

1. Could you briefly describe your facilities and what services you offer to your users/clients?
2. (Total Acres, Land Use, Buildings, Location to Urban Center, Livestock, etc)
3. What is the mission of your facility?
4. What is the administrative structure of your operation?
5. Who are the primary users?
6. How many people in these primary groups use the facility in a given year?
7. What public programs/services do you offer (Field Days, tours, classes, etc)?
8. How is your facility funded? What is the annual operating budget?
9. How secure or sustainable is your funding?
10. What kinds of challenges/pressures do you face (financial, space requests, urban encroachment, etc)?

11. What transportation systems serve your facility?
12. Do you have any type of housing for facility users?
13. Do you have any food preparation or food service to serve the public?
14. What is your long term vision for your facility?

## **INTERVIEWS WITH SELECTED COMPARABLE FACILITIES**

### **MISSOURI UNIVERSITY – BRADFORD RESEARCH CENTER, COLUMBIA, MO**

(Interview with Andrew Biggs, Brad Research Center Superintendent)

Bradford Research Center, located 11 miles east of the MU campus on 591 acres, has the largest concentration of research plots in crops, oils and related disciplines in Missouri. It is one of thirteen Agricultural Research Centers totaling 14,000 acres, the MU College of Agriculture, Food and Natural Resources operates across the state to meet the regional research and demonstration needs of agricultural producers and natural resource managers.

The station's primary mission is to support researchers with a secondary mission of providing community outreach and education activities. The station is used by approximately 1000 students each semester as part of their formal class work.

Of the 591 acre total, approximately 240 acres are suitable for crops. Of these, 220 acres are used for research and the remaining 20 acres are used for income producing crops or outreach plantings. The station leases an additional 240 acres of land for income producing crops.

The Center's main research focus is agronomic research, but faculty and students also investigate wastewater management, entomology, pests and weed control, alternative crops, permaculture, native plants, pollinators, wildlife habitat, organic transition techniques and the impact of hailstorms. The Center has a composting facility and works with the campus dining service to compost kitchen food waste, but the composting/recycling work on the Center is modest in scope. There is no established fruit research area established on the Center, although the station grows up to 250 varieties of tomatoes each year. The close proximity of the Center to the main campus allows approximately 28 MU and USDA-Agricultural Research Service faculty members in various disciplines to establish more than 25,000 plots at the Bradford Research Center each year. The Center Superintendent makes land assignments each year, based upon requests or multi-year commitments for research space. The Center has no livestock on the property and they are not required to provide any services/support to the College animal science programs.

Funding is available from the College of Agriculture, Food and Natural Resources for 4 Center staff, which includes the Station Superintendent, Farm Manager, Mechanic, and Office Support. This funding is through HATCH grants. An additional \$25,000/year is allocated to the Bradford Center (from the total MU Research Farm budget) for maintenance of *existing facilities and grounds*. Other funding for the Center operations comes from crop sales of corn, soybeans and wheat and charges to researchers. This funding supports 3 year-round student workers plus 2 to 3 seasonal student workers. Researchers are charged a base \$120/acre facility use charge which is used to pay for operating expenses and utilities. Researchers utilizing land for crops other than corn, soybeans or wheat are assessed a "lost crop income" charge based on average soybean yields of 40 bu./acre. There may be additional charges depending on what services/supplies their program might need from the Center. Researchers are responsible for providing their own seeds and any specialty chemicals they might need (generic pesticides are usually

provided at no charge by the Center). Large projects conduct their own pest control, but the Center farm staff provides pest control for smaller research programs (1 to 3 acre sized projects) that are more lab focused. Researchers are charged for their Nitrogen needs. The station's 240 crop acres are farmed under a lateral move irrigation system. The Center farm crew operates the irrigation system and that is a major activity, both in labor and maintenance expenses. If a researcher requests special irrigation, there is a \$300 charge each time the irrigation system has to move to provide this special irrigation. Generally new faculty (truly new faculty who are not hired into an existing, established program) are not assessed charges until they are able to establish their programs and funding.

The City of Columbia, MO is growing rapidly, but the Center remains outside the city limits and has not had any development pressure to speak of. There is no public transportation (bus) service to the Center. The Center has an Advisory Board, made up largely of private sector ag-business representatives, local farmers and two to three faculty members. They meet once each year, mainly to hear an annual report of activities the Center Superintendent puts together. During the year the Superintendent relies on input from the largest land users to resolve any problems or issues.

The Bradford Center engages the community through workshops, field days, corn maze, the Tomato Festival, and native plants and pumpkin giveaways. The majority of this outreach effort is coordinated by the Center Superintendent with help from campus departments, organizations and Extension. They will host approximately 1750 high school students during their Ag Ed Day which features as many as 48 different speakers. Their annual Tomato Festival draws 1000 people and includes the opportunity to taste and rate up to 180 varieties of tomatoes and 160 varieties of peppers. In the fall the station will host 40 tours of students K-12. These tours are conducted by the Center Superintendent or two graduate students. The highlights of these tours are the corn maze and the 6 acre pumpkin patch (each student gets a pumpkin during their visit). The corn maze and pumpkins are grown on the 20 or so acres that are not used for research. In addition to these field days, the Center also offers a Quail Field Day, Native Plant Field Day, Vegetable Farmer Field Day, and Organic Field Day. The Center offers visitors an opportunity to tour a Gene Zoo, Rose Garden, Cover Crop Garden, and Biofuel Garden. These gardens are largely operated and maintained by a professor with a large Extension appointment. The Center has a Passive Solar Greenhouse which receives a great deal of public interest. They have a Mobile Flash Freeze Vegetable Kitchen, but this has not received much use in recent years.

The Center has eight buildings, two of which are used exclusively by research programs and two which have no utilities. Long range additions would include an upgrade to their drier facilities and a large visitor pavilion. Future goals would be to no longer have to lease additional cropland, and increase in the density of the research, and finding additional funding resources which do not put more pressure on the researchers.

### **OKLAHOMA STATE UNIVERSITY – THE BOTANIC GARDEN, STILLWATER, OK**

(Interview with Randy Raper, Assistant Director Oklahoma Agricultural Experiment Station)

Oklahoma's Agricultural Experiment Station - Field and Research Service Unit (FRSU) serves as the backbone for more than 1,000 statewide field- and lab-based research trials annually. The FRSU consists of 18 outlying research stations, the Controlled Environmental Research Lab, Ridge Road Greenhouse Phase I and Phase II, the Noble Research Center and the Stored Products Research and Education Center. The FRSU support includes an electronics support shop for lab equipment located in the Noble Research

Center, a fleet of 90 vehicles and a fully staffed mechanic shop, a project management group for capital improvements and repairs, and a staff of 70 full-time and 30 part-time employees statewide. The FRSU provides a central focus for station operations and management with the goal to improve overall efficiency by providing a systematic means for budget management, facility upgrades, consolidation of labor pools, maintenance and repair of equipment and buildings and other infrastructural needs. The Stillwater, OK research facilities, located adjacent to the OSU campus and the city of Stillwater, includes their Botanic Garden/Turf Center (generally just referred to as The Botanic Garden). The 100 acre Botanic Garden has the dual purpose of being a research facility for turf grass and a little ornamental horticulture, and a formal garden area. Their unique geographic location near the confluence of two watersheds allows the site to also serve as a host for various research projects dealing with environmental and water management issues. The Botanic Garden also functions as a major teaching and extension resource for the Division of Agricultural Sciences and Natural Resources. In addition to serving as an outdoor classroom for several departments, the Botanic Garden hosts many workshops and other educational events throughout the year.

The crown jewel of the facility is the “OKLAHOMA GARDENING” STUDIO GARDEN that is the scene of a weekly PBS series. This half-hour program, called Oklahoma Gardening, began in 1975 with an Oklahoma Cooperative Extension Service horticulturist demonstrating basic gardening techniques. In 1980, the Extension horticulturist began hosting the show from his backyard in Stillwater. In 1986 the show featured gardens and arboretums across the state. That same year the show was given a parcel of land west of the OSU campus in Stillwater. In 1987, two new hosts, both Extension horticulturists, converted this parcel of land (essentially an overgrown research plot) into demonstration gardens, and began teaching viewers how to build raised beds, plant a fruit orchard, install a new lawn, design flower beds and much more. In 1990, a full time garden manager was hired. At the same time, Steve Dobbs, an Extension Consumer horticulturist, was hired as the show’s seventh host. During his tenure as the show’s host (1990 – 1995), he established the OKG Ambassadors, a volunteer group to assist with the planting and promotion of the studio gardens. An irrigation system, formal garden, shade-loving perennial flower beds, water gardens, a butterfly garden, and a garden railway were also added. An additional Consumer Horticulturist was added in 1997, along with an alpine rock garden and a Japanese Tea Ceremony Garden. In 2001 the garden included a Japanese garden, patio garden, chicken moat, lotus garden, sun perennial garden, herb garden, and the Oklahoma Proven garden (a plant promotion program coordinated by faculty in the Department of Horticulture and Landscape Architecture at Oklahoma State University. The goal of the program is to recommend plants well-adapted for use across Oklahoma).

In 2015 the Botanic Garden logged 3003 volunteer service hours contributed by TBG Ambassadors, received \$47,456 from donors, sponsorships and a Mum sale, hosted 7515 visitors who attended 162 workshops, meetings, events camps and tours, and served as an outdoor classroom to 21 OSU classes. 2015 also saw the formation of the Friends of the Botanic Garden, a group of long time garden supporters with a passion of horticulture. The Friends of the Botanic Gardens offers a variety of support levels that includes Contributing Member (\$50 to \$99), Sustaining (\$100 to \$249), Patron (\$250 to \$499), Sponsor (\$500 to \$999), Benefactor (\$1000 and above). Special funding opportunities are also offered such as “Laura’s Bandstand”.

The Botanic Garden staff includes a Director, Garden Manager and a Volunteer & Education Coordinator who coordinate and conduct the public outreach activities of the garden. The Turfgrass Center efforts are supported by a Station Superintendent, Maintenance Mechanic and Senior Agriculturist. The Division of Agricultural Sciences and Natural Resources at Oklahoma State University provides salary and financial support.

## **TEXAS A&M UNIVERSITY AGRI-LIFE RESEARCH & EXTENSION CENTER AT DALLAS, TX**

(Interview with David Lunt, Interim Center Director)

The Agri-Life Research and Extension Center (ALREC) is a former wheat breeding station, located 15 miles from the downtown campus. Over time the city grew and overtook the station land. Donors had made a provision from the sale of land needed to stay with the area for research purposes. 160 of the original 240 acres were sold to fund the development of the remaining 80 acres. With the sale of the land, the new development shifted the traditional agronomic activities to other stations, but kept their turf program on-site. They originally retained a horticultural program focusing on breeding ornamental plants, but the failed for lack of funding support. The new center oriented research towards lab research activities, including water management, water quality, storm water management and managing home lawns. The former agronomic focus shifted to plants grown in cities (lawns, trees). Financial support was sought from a variety of sources. They had success in targeting municipalities and private industries with interest in their programs (Scott Turf, for example), although the purposely stayed away from greenhouse industries as they felt these needs were already being met by other research programs. They hired new faculty willing to cooperate with these groups and re-located other faculty to re-staff with new faculty whose interests focused on urban clients and not traditional Ag interests. One example of this was the move of the weed breeding programs to another research station in order to use this high value land for something other than just raising crops. New facilities were built to meet new program needs. The new research center was built in partnership with city planners as a demonstration “green building”. The new center features park landscaping that show cases research in reduced water runoff, water quality and water management. Other new programs include urban food production and a project using old shipping containers as vertical food production systems. They partnered with LED lighting companies and other “green” industry partners, looking at recycling residuals to keep them from landfills by using these for power plant energy production in a power center that was built. They retained an old facility for use as incubator space for new industries.

A key to their success was great support from campus for this “start-up enterprise” transition as they developed the new center. The biggest challenge was finding the money for the development. They hired a fund raiser who worked with city and corporate funding to supplement their research funding. They developed fee-based programs that included training municipal and industry water managers. They built and sold thousands of rain barrels at \$50 each. They have re-trained their faculty to ask for much larger research grants. They hired a grant writer to assist the researchers in developing their grant requests. One of their great successes was the remodeling of an old center residence into a demonstration “water-sense” house that maximizes water efficiency. They partnered with the City of Dallas water utility and received a large EPA grant to help with this remodeling. They had 5000 visitors at the first open house and host thousands of visitors annually for tours of the house. This demonstration house and the new research center “green building” are examples of their mission to show people how to do it and not just tell them how to do it. Wherever possible, they focus on problems facing urban centers and work on those problems. They address:

- **Best Management Practices (BMPs)** - developing and transferring information for BMPs for insects and diseases, soils, stream restoration, rainwater capture, stormwater management, bioretention methodologies, biofiltration to improve contaminated water, etc.

- **Water Conservation** - capturing and utilizing rainwater, using alternative sources of water such as saline aquifers, mitigation of stormwater and urban runoff, design and use of drainage and irrigation systems and facilities, etc.
- **Disturbed Land Reclamation** - converting landfill sites to areas of public uses (e.g., parks and recreational areas), restoring eroded stream banks, preventing sedimentation of lakes, waste disposal and recycling, etc.
- **Soils Improvement** - creating and using compost, improving soils for moisture management, improving soils in areas of new construction, etc.
- **Plant Improvement** - creating, producing and managing turf and ornamentals with resistance or tolerance to insects, diseases, and harsh or specialized environments (e.g., heavy-use athletic fields, non potable water or salty waters, disturbed soils or habitats, hot-dry environments, recreation and park areas, areas with reduced or no sunlight, etc.).
- **Plant Management** - eliminating, preventing and managing invasive plants; aquatic or terrestrial weeds; turf and ornamentals; preventing or managing insect pests and plant diseases, etc.
- **Non-Point Source Pollution Management** - developing and transferring BMP information on stormwater and urban runoff, landscapes, road rights-of-way, agricultural lands, etc.
- **Energy Conservation** - developing and using plants for reducing energy use (e.g., "green roofs," use of shade from ornamentals, elimination of "heat islands", etc.)
- **Public space planning and implementation** - developing and transferring information for reclaimed landfills, recreational use of local streams and waterways, ornamentals, turfs and "green" designs for public parks and recreational facilities, etc.

They were successful in receiving an EPA grant to help with a full site storm water management demonstration that includes a meandering stream and on-site pond. The net result of this was to achieve zero storm water run-off from the site. The center offers outreach classes and professional programs including lawn irrigation management, professional pest controls, municipal/industry water management, etc. The turf research program offers two field days that includes one for professionals and one for home owners, however the biggest audience they target are professionals.

It is a two day drive from College Station, Texas A&M's main campus, so staff at the center includes up to 8 faculty who work at the center and have their lab programs located there. The center faculty have 100% research appointments and are not tenure eligible, although they do have a promotional track (assistant to associate to full professor). Other center staffing includes an office administrator, facilities maintenance person(s), and faculty support assistance (1 per faculty member). Center faculty support their research activities largely from their own grant funding. State and Hatch money fund the center staff, along with about \$2 million of outside funding for a total annual budget of \$4 to \$5 million dollars. All center faculty report to the center director, however they also have department appointments to the campus and operate through their academic related department when seeking grants. The center director does annual reviews, hires center appointments and recommends personnel for promotion.

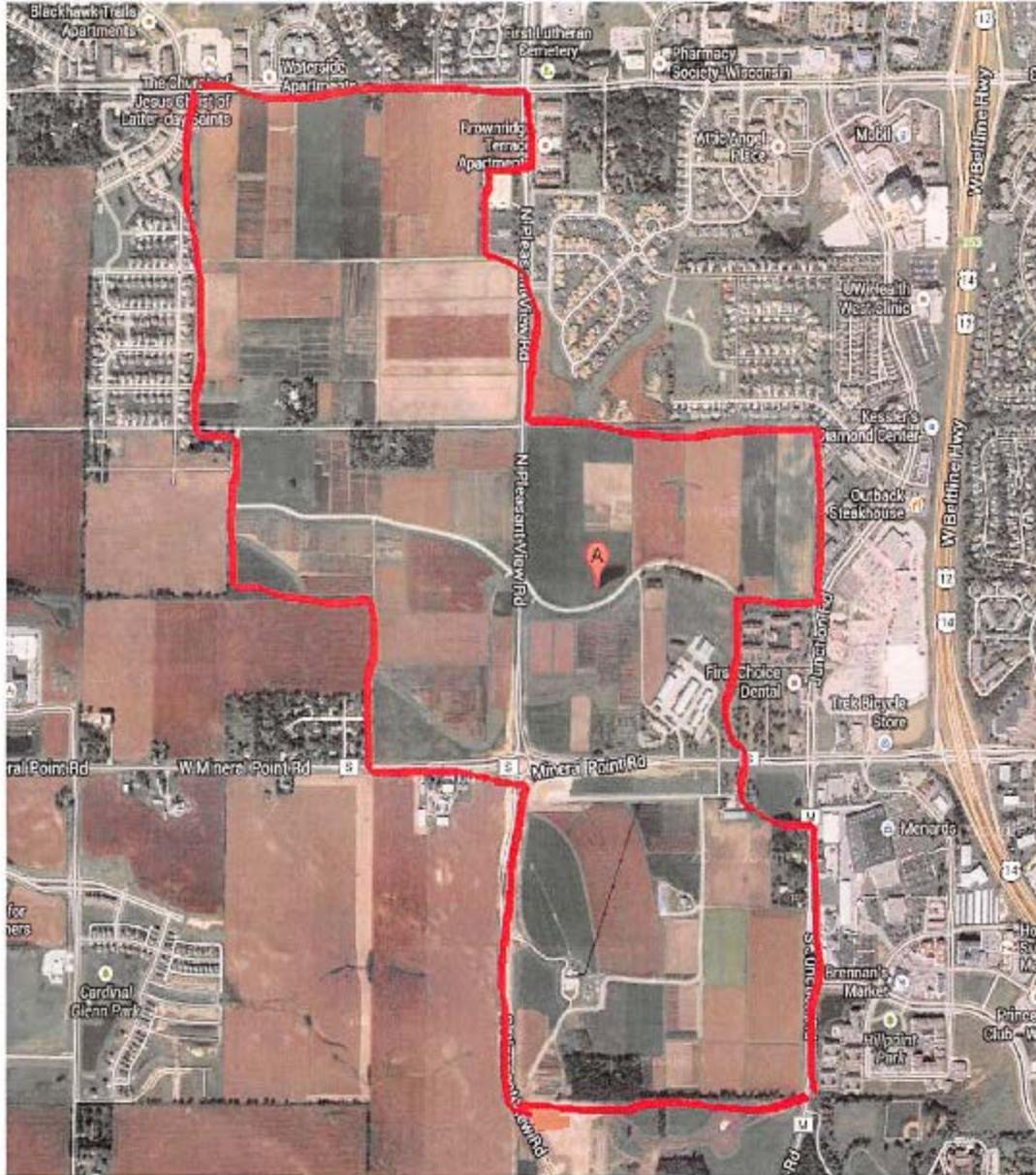
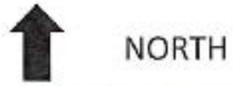
The Extension presence with the center operates largely independently without much collaboration with other center activities. The exception to this is the Extension Turf Specialist who works closely with the ongoing turf research program. There is also a water person who has a joint research and Extension appointment. The center director feels there should be a closer partnership between the center and Extension and noted the outreach efforts are aimed at a new millennial audience, rather than an older population that is usually more typical of Extension audiences.

The center has a total of three buildings. They have employee lunch rooms, but no food service or on-site

lodging. They rely on access to the University of Texas facilities that are located across the street from the center and include a 550 seat auditorium and numerous meeting rooms.

# STATION MAPS





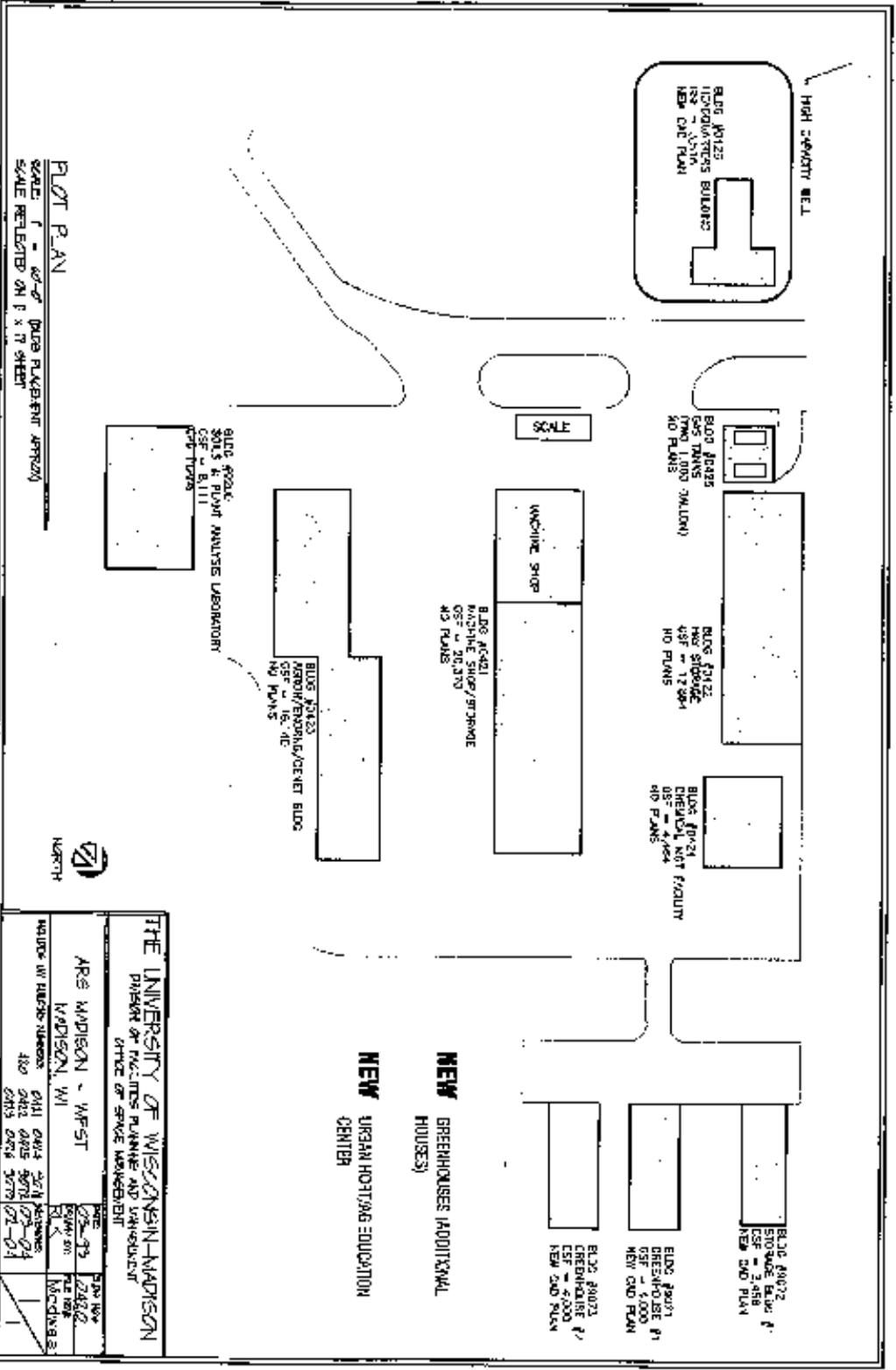
West Madison Ag Research Station











PLANT PLAN  
 SCALE: 1" = 60'-0" (BASE PLACEMENT APPROX)  
 SCALE REFLECTED ON E X T SHEET



THE UNIVERSITY OF WISCONSIN-MADISON  
 PLANT AND FACILITIES PLANNING AND MANAGEMENT  
 OFFICE OF SPACE MANAGEMENT

AREAS WISCONSIN - WEST  
 MADISON, WI

NEW GREENHOUSES (ADDITIONAL HOUSES)  
 NEW URBAN HOUSING EDUCATION CENTER

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