

College of Agricultural, Human, and Natural Resource Sciences

Academic Affairs Program Prioritization Report

March 2008

Executive Summary

The Academic Affairs Program Prioritization process in the College of Agricultural, Human, and Natural Resource Sciences (CAHNRS) was conducted following a comprehensive strategic planning exercise and the implementation of numerous changes within the College. Current and planned adjustments are directed at achieving several objectives, but must importantly, increasing doctoral program enrollment; building upon existing areas of preeminence, particularly within the agricultural sciences; consolidating academic units and academic programs; and increasing research productivity and faculty/unit accountability. Many of the “alternative futures” recommended in this report reflect these directions. Units recommended for growth and investment represent a “bundle” of complementary, high performance programs which, if provided additional resources, will catapult WSU into the next level of global preeminence in the agricultural sciences. The College has been actively engaged in consolidation and reorganization (examples include formation of the School of Economic Sciences and the Bi-State School of Food Science, as well as closing two of its research and extension centers), and four additional reorganizations are currently being actively discussed. These proposed reorganizations and necessary consolidation of academic programs (particularly at the graduate level) are reflected in the relatively large number of programs appearing in the “reorganize, consolidate, or reduce” column of the prioritization summary table.

Context Statement

CAHNRS is distinct from other programs at WSU in mission, organizational structure, and sources of funding. In order to place the specific program-oriented discussions found below in the proper context, it is necessary to have a basic understanding of how these characteristics influence decisions concerning strategic priorities, academic programs, resource allocation, and the blend of programs and activities that comprise the college.

CAHNRS is an expansive and diverse college that includes 15 academic departments, four research and extension centers, and several subject matter centers and institutes. Its faculty are geographically distributed and located at all four campuses, four research and extension centers, and the University of Washington. While at first glance its units may appear disparate, a common thread connecting all units is a commitment to stakeholder engagement and research and outreach programs to assure application of research-based solutions to human, agricultural, and natural resource issues facing the state.

Two important organizational entities within WSU are actively engaged in the research and outreach missions of the College. The Agricultural Research Center (ARC) is administered by CAHNRS, and provides funding and administrative support to address issues of critical importance to the state’s food and agriculture industry. WSU Extension makes major investments in CAHNRS with the objective of bringing to the public the College’s scientific and problem-solving resources in the agricultural, human, and natural resource sciences. Funding to support these programs is provided from state and federal allocations, extramural grants and contracts, and gifts. ARC and Extension funds are budgeted separately and must be used for the expressed purposes dictated by state and federal legislation.

The unique funding model of agricultural and natural resource programs requires one to carefully interpret data reported by the Office of Institutional Research (OIR). It suffices to say that WSU data management systems are not proficient in handling the funding complexities of CAHNRS and its

programs. Most importantly, the appointments of faculty working in these program areas typically are divided between Academic Programs, Agricultural Research, and Extension. For example, a faculty member's appointment may be 0.4 Academic Programs and 0.6 Research (funded through the ARC). However, Institutional Research only reports faculty FTE in the Academic Programs area, and their data would only recognize the 0.4 FTE in this example. Therefore, OIR data grossly understates the number of faculty FTE comprising an academic unit. In addition, various productivity measures (e.g., extramural funds) are sometimes not credited to the department where the faculty member is appointed, and is instead credited to another organizational entity (e.g., WSU Extension, a center or institute). The CAHNRS Academic Programs Office and the ARC have worked over the past few months to provide units with accurate data which account for these idiosyncrasies. Data discrepancies are often noted in the attached unit self-studies with the presentation of both OIR data and CAHNRS data.

Over the past decade, CAHNRS has aggressively engaged in organizational restructuring and downsizing of its infrastructure, particularly in its research and extension center facilities. Examples of restructuring aimed at capturing efficiencies and synergies include the formation of the School of Economic Science and the recent formation of the Bi-State School of Food Science. Due to fiscal necessity, several research facilities have been downsized, and two research and extension centers eliminated. Ongoing planning activities could result in the formation of three separate inter-college units – natural resource and environmental sciences, chemical and biological engineering, and design.

The majority of the college's programs and resources (particularly in research and extension) are directed toward its agricultural mission. WSU has long-standing strength and tradition in research and education programs supporting plant and animal agriculture. The College takes its role as the research and development arm of Washington's food sector seriously, and the importance of this mandate is well stated by President Elson S. Floyd's justification for identifying agriculture as the University's highest priority – "Agriculture is our unique and express mission in the state of Washington. If we don't work with industry to create a prosperous, competitive, sustainable food system; who will?" This is a challenging responsibility, as Washington has the nation's second most diverse agricultural industry, with over 250 commodities produced at commercial levels. This program is operated as a true public-private partnership. Industry input weighs heavily in establishing strategic priorities, and grants and contracts from industry groups are a critical component in closing the gap between state funding provided for agricultural research and extension and industry needs.

Human sciences represent another significant component of the College. Three programs – Apparel, Merchandising, Design and Textiles; Human Development; and Interior Design – have a well established tradition of excellence in undergraduate education. However, for several years, large undergraduate programs were maintained at the expense of research scholarship. Recent efforts have focused on re-balancing these programs by redirecting resources and priorities to research and graduate education. The College's largest human science unit is the School of Economic Sciences, which was created in 2004 through a merger of two departments. Significant progress has been made to advance research scholarship in each of these units, as evidenced by improvements in research and graduate program metrics over the past three years and the quality of recently recruited faculty.

Academic Units

Department of Animal Sciences

(Teaching & Learning = M, Research & Scholarship = M, Outreach & Engagement = M)¹

The Department of Animal Sciences is critical to the College's continued advancement of its national reputation in agricultural sciences and service to its stakeholders. It is the principal unit in CAHNRS

¹ G&I = growth and investment; M = maintenance; RCR = reorganize, consolidate, or reduce; and PO = phase out.

which serves the state's expansive food animal industry. Unfortunately, significant budget reductions to the program over the past two decades have severely reduced effectiveness and impact, particularly in research and extension. Recent effort has been directed towards rebuilding this program (including investment in faculty FTE) to a level which adequately serves the state's livestock industry and supports the program in establishing a national reputation in one or two areas of excellence. The department's future plans also connect it closely with the University's Global Animal Health Initiative, and to food science and technology research in the School of Food Science and the Department of Biological Systems Engineering.

As described in the self-study document, Animal Science research programs are critical from the standpoint of centrality and external demand, and these attributes have to be balanced against a historical record of low productivity relative to other agricultural programs in the College. Weighing these contrasting criteria led to a recommendation of "maintenance" in the area of research and scholarship. Departmental extension programs have been severely affected by years of faculty retirements without replacing these positions. Some investment has been made to bolster these programs in the last two years, but additional faculty FTE is required to even reach a level to minimally serve industry.

Despite downsizing, the department has maintained a level of excellence in undergraduate education. By many measures, Animal Science's undergraduate programs set the standard for agricultural and natural resource programs in CAHNRS. The quality of its out-of-class activities (e.g., student club, student operated cooperatives) is outstanding. Enrollment in departmental graduate programs is low; although, several faculty also contribute to graduate education by advising students enrolled in interdisciplinary programs.

Department of Apparels, Merchandising, Design, and Textiles

(Teaching & Learning = M, Research & Scholarship = M, Outreach & Engagement = RCR)

The Department of Apparels, Merchandising, Design, and Textiles (AMDT) has undergone significant transformation and targeted investment in the last three years. As a result of strong growth in undergraduate enrollment over the past decade, past faculty and resource commitments have been principally directed toward serving the undergraduate program. Recent investment and activities have focused on re-balancing the department to empower faculty to enhance research scholarship and expand the graduate program. The academic/business plan for the unit is comprised of three principal components: (1) leadership, (2) faculty, and (3) facilities. A new chair with outstanding research and leadership credentials has been hired from the University of Georgia. Through commitment of new resources, filling existing vacancies, and conversion of instructor positions to tenure-track positions, five new faculty (nearly two-thirds of the tenure-track faculty) have been hired in the past two years. AMDT has been housed in dilapidated "temporary" facilities for the past decade, which severely limited the ability of the program to succeed. A plan for development of a renovated facility to house the department is in motion, which has the support of both the College and University Administrations.

The Washington apparel industry is the fourth largest in the U.S. and a significant demand for this program exists as demonstrated by enrollment trends and high demand for its graduates by industry. Our goal is to make WSU the preferred destination for students in the western U.S. with interest in careers in the apparel industry. We intend to become the most valued educational and research resource of the region's growing apparel industry. Based upon criteria such as centrality, productivity, internal/external demand, and cost effectiveness, justification exists for "growth and investment" in the teaching and learning area. However, much of this investment has occurred with recent faculty hiring; hence the "maintenance" recommendation. Conversely, based upon past productivity, a designation below "maintenance" could be rationalized in the area of research and scholarship. Again, new investment has

occurred which is already translating to enhanced research and outreach productivity. It would be unwise to reverse this investment strategy, and thus “maintenance” is recommended to enable return on this investment to be realized over the coming years.

Institute of Biological Chemistry

(Teaching & Learning = M, Research & Scholarship = G&I, Outreach & Engagement =M)

The Institute of Biological Chemistry (IBC) is one of WSU’s premiere research units. By all measures of research productivity, the IBC is one of the most productive research units at WSU and relative to its peers across the globe. The unit ranks first in the College in both extramural funding and research publication output, and the IBC faculty have contributed significantly to recently received rankings from two independent studies placing WSU 2nd and 5th in plant sciences at the national level. With respect to research and scholarship, this unit is clearly worthy of “growth and investment.” Its productivity metrics (extramural funds, publications, faculty recognitions) place it among the elite at WSU. “Growth and investment” in the unit’s research programs is also defensible from the standpoint of centrality, internal and external demand, and cost effectiveness. IBC programs are critical to the successful fulfillment of WSU’s objectives in agriculture and biofuels/bioproducts research and must be integrated into the remainder of the College’s plant science activities. Effectively, there is little teaching or outreach investment in the IBC; alternative futures of “maintenance” are recommended for these areas.

Department of Biological Systems Engineering

(Research & Scholarship = G&I, Outreach & Engagement = G&I)

The Department of Biological Systems Engineering (BSE) focuses principally on research and graduate education. BSE is one of the most productive research units in CAHNRS and at WSU. Despite its modest faculty size, the unit publishes an impressive number of refereed publications (approximately 6 refereed articles per faculty FTE) and receives over \$2 million of extramural support each year. Its graduate program metrics are among the most impressive at WSU – approximately 6 graduate students per faculty FTE and a 3:1 Ph.D.:M.S. ratio. Its ranking among peer departments across the country places BSE among the top-10 units in every relevant productivity measure.

The unit’s areas of research emphasis are central to the college’s strategic priorities and include bio-energy and bio-products, food engineering, and land-air-water resources and environmental engineering. The unit also will be a significant contributor to efforts to “ramp up” activities in automation and mechanization of agricultural production and processing (see Center for Precision Agricultural Systems self-study report). Currently, the unit has a relatively small commitment of faculty FTE to Extension; however, all of its faculty maintain active outreach programs focused on the dissemination of research findings. Because of the importance of several of the unit’s program areas (e.g., biofuels, water resources) to critical issues facing the state, we would expect investment of additional Extension resources in this unit. Based upon centrality, productivity, cost effectiveness, and demand for its services and students, this is a unit worthy of a “growth and investment” designation in research and scholarship, teaching and learning, and outreach and engagement. Teaching resources in BSE are under the control of the College of Engineering and Architecture; therefore, an alternative future in this area is not proposed here; nonetheless, increasing teaching resources will allow for further expansion of graduate programs in concert with research areas and is supported by CAHNRS.

Department of Community and Rural Sociology

(Teaching & Learning = PO, Research & Scholarship = PO, Outreach & Engagement = PO)

The Department of Community and Rural Sociology (CRS) is a small department by virtually all

measures. It has no academic programs, although several of its faculty contribute to both undergraduate and graduate education by teaching classes, serving on graduate advisory committees, and chairing M.S. committees. For the small commitment of teaching FTE allocated to the unit, CRS faculty generate a significant number of SCHs. Its reported research and outreach contributions (particularly in the generation of extramural funds) constitute a reasonable level of productivity for a social sciences unit and reflect the work of several productive faculty with appointments in the unit. An interesting observation is the discrepancy between department-reported extramural funding and that reported by OGRD. These differences reflect the fact that these grants are principally outputs of centers and programs which departmental faculty administer outside the department, and the reality is that most of these activities would continue with or without the presence of CRS.

Most stand-alone rural sociology units in land-grant universities have been merged into other units. Those that are stand-alone units are larger, better resourced, and maintain active academic programs. It is recommended that CRS be “phased out” as an independent academic unit, and its faculty and activities consolidated into another unit. Several organizational alternatives are currently being evaluated, involving other units both within and outside CAHNRS. These organizational structures should augment the strength of the CRS faculty – the ability to connect to other programs and faculty for the purpose of conducting interdisciplinary scholarship. The most promising alternative involves the merger of CRS faculty, staff, and programs into an inter-college school focusing on natural resources and environmental sciences.

Department of Crop and Soil Sciences

(Teaching & Learning = RCR, Research & Scholarship = G&I, Outreach & Engagement =G&I)

The Department of Crop and Soil Sciences (CSS) is the largest unit in CAHNRS and central to WSU’s strategic goal of advancing the agricultural sciences and serving the state’s agricultural industry. CSS is a major contributor to WSU’s #2 ranking in plant sciences, and ranks 7th in the nation (#2 in the western U.S.) in the area of agronomy. CSS ranks 2nd at WSU in extramural funding and is a university leader in the development of proprietary technologies. The unit’s extension programs are very strong and highly valued by industry. Based upon all relevant criteria, alternative futures of “growth and investment” are recommended for both outreach and engagement and research and scholarship.

CSS supports a large number of academic programs, including departmental programs and interdisciplinary programs administered outside the unit. Enrollments in departmental undergraduate programs are not at sustainable levels. Historically, graduate programs also have been under-enrolled; however, the department has responded to the University’s and College’s increased emphasis on doctoral enrollment. As with other plant science programs, consolidation of graduate programs to form interdisciplinary programs of national stature is necessary (e.g. plant genomics, genetics and breeding), and an alternative future of “reorganize, consolidate or reduce” is recommended for the teaching and learning program area.

School of Economic Sciences

(Teaching & Learning = G&I, Research & Scholarship = M, Outreach & Engagement = G&I)

Since its formation in 2004 through the merger of the Department of Economics (College of Business) and the Department of Agricultural and Resource Economics (CAHNRS), the School of Economic Sciences (SES) has made tremendous advancement in all program areas – undergraduate programs, graduate programs, research, and outreach. SES may be the model for successful, cross-college unit reorganization at WSU. The faculty and College have lofty goals for the unit, including a top-40 ranking in general economics and top-5 ranking in agricultural and resource economics. To achieve these goals

will require continued strategic investment to enable the unit to continue to build on the strong positive momentum of the past three years.

It would be misguided, and largely irrelevant, to judge the future of SES based upon the productivity of its predecessor departments. Because of the infancy of this unit, the best forecast of future productivity is trends observed since the unit's inception. Over the three-year period, undergraduate majors have increased 20%, doctoral students 24%, undergraduate class enrollment 25%, and graduate class enrollment 75%. The number of graduates from undergraduate, M.S., and Ph.D. programs has increased 150%, 27%, and 150%, respectively. From a research perspective, refereed publications have doubled and research grant funding has increased 75 percent. These are impressive levels of progress and are a credit to the unit's faculty and administration. In addition, over a third of the unit's faculty have been hired in the last three years, and these statistics largely do not reflect the contributions of these faculty.

The merger of Economics and Agricultural & Resource Economics programs is quite unique across land-grant institutions. Because SES represents the only presence of economics faculty at WSU, its mission is broad and encompassing. Not only does the unit provide a large service function in the delivery of undergraduate economic theory courses, but it must also advance disciplinary scholarship, serve growing undergraduate and graduate enrollments in general economics, and serve the natural resource and agricultural industries of this state through applied research and outreach. Current faculty numbers are simply not adequate to meet these mandates. A loss of nearly 10 faculty FTE over the last decade when Economics resided in the College of Business and a loss of 5 FTE in Extension Agricultural Economics left this unit at a woefully low starting point when it was formed in 2004. Continued "growth and investment" is required to build upon recent successes. The self-study document does an excellent job of explaining these alternative futures based upon centrality, quality, internal/external demand, cost effectiveness across all three areas (teaching and learning, research and scholarship, and outreach and engagement).

Department of Entomology

(Teaching & Learning = M, Research & Scholarship = M, Outreach & Engagement = M)

The Department of Entomology boasts strong research and outreach programs, and is integral to the college's continued advancement of its national reputation in agriculture sciences and service to its stakeholders. These programs are central to the university's and college's mission, highly demanded by industry and government agencies, and well integrated with both internal agricultural programs and programs external to the university. Entomology faculty are productive as measured by extramural funding (\$137,000 annual average per FTE) and refereed publications (2.05 per FTE). Within the area of outreach and engagement, Entomology likely boasts the most impactful program among CAHNRS departments, and likely across the university. The Urban IPM program, Washington State Pest Management Resource Service, and the Food and Environmental Quality Lab are examples of programs that are nationally recognized and regionally valued by stakeholders.

Entomology's efforts in academic programs are primarily focused on graduate education, although it does provide important courses in support of undergraduate agricultural programs and two highly demanded general education courses. M.S. and Ph.D. enrollments (14 M.S. and 9 Ph.D. students) are not at levels necessary to sustain these programs and must be increased. One important challenge to graduate enrollment is the geographically dispersion of the faculty. Over half of the unit's faculty reside outside Pullman and are located at the four research and extension centers and the Tri-Cities campus.

The size of the Department of Entomology faculty is adequate to address its multi-dimensional mission and is on par with peer institutions. Recommended alternative futures are "maintenance" across research

and scholarship, teaching and learning, and outreach and engagement.

Department of Food Science and Human Nutrition (Bi-State School of Food Science)

(Teaching & Learning = M, Research & Scholarship = G&I, Outreach & Engagement = RCR)

The Department of Food Science and Human Nutrition (FSHN) is in the midst of significant organizational restructuring. In Fall 2007, the human nutrition and dietetics faculty were moved to the Division of Health Sciences, paving the way for the proposed formation of the Bi-State School of Food Science which merges the food science faculty and programs from the WSU Department of Food Science and Human Nutrition with the food science faculty and programs from the University of Idaho (UI) Department of Food Science and Toxicology. The Bi-State School of Food Science is unique in the nation and provides immediate national impact and recognition. With this merger anticipated in Summer 2008, teaching, research, and extension programs within the School of Food Science are expected to advance into the top tier of universities with food science programs in the United States based on faculty numbers, undergraduate and graduate student enrollment, degrees granted, research productivity, and extension programming.

The self-study is written from the perspective of the Bi-State School of Food Science and combines data from the WSU and UI programs. In addition, because past OIR data reflects the combined programs of food science, human nutrition, and dietetics, these data are difficult to interpret. The research strength of the former FSHN department rested in food science, and metrics describing research productivity are relatively strong (see self-study document). Academic Analytics ranked WSU food science programs 6th in the nation. Food Science has a strong and effective extension program; albeit, it is small in size and significant reorganization will be required to execute its new bi-state mission function. With the merger of current resources from UI and additional investment from both institutions, significant enhancement of research and extension outputs and outcomes are anticipated.

The Food Science undergraduate program can be best described as “high quality, low quantity.” Past B.S., M.S., and Ph.D. enrollments (WSU separate or WSU and UI combined) are below expectations and projected to increase. An alternative future of “maintenance” is proposed in the teaching and learning area, as the expectation is that the merged unit will be able to grow its undergraduate and graduate programs with existing resources.

Department of Horticulture and Landscape Architecture

(*Horticulture*: Teaching & Learning = RCR, Research & Scholarship = G&I, Outreach & Engagement = M; *Landscape Architecture*: Teaching & Learning = M, Research & Scholarship = RCR, Outreach & Engagement = RCR).

The unit self-study integrates both the Horticulture and the Landscape Architecture Programs into a single report because data were not available to separate performance between the two programs. Because of significant differences in these two programs, they are discussed separately and “alternative futures” are reported for each.

Horticulture. Establishing WSU as a global center of excellence in horticultural research and education is a top priority of CAHNRS. Indeed, if agriculture is one of the WSU’s highest priorities, global recognition of our agricultural programs must begin with horticulture. The importance of this program from the standpoint of centrality, internal/external demand, and serving stakeholder interests is obvious. The State of Washington has one of the largest and most recognized horticulture industries in the world, and a world-class horticulture industry must be supported by a world-class horticulture program. In the

recent study conducted by Academic Analytics and published in the *Chronicle of Higher Education*, WSU was ranked 8th in the nation among horticulture programs; our goal is to become one of the top-3 programs in the country within three years.

Significant investment in the horticulture research and extension program has occurred in recent years. Most noteworthy has been the hiring of three high-quality faculty in genomics and two in tree fruit breeding. This research cluster has greatly enhanced WSU's reputation in horticulture genomics and genetics. Research metrics are reflective of a high level of productivity and are improving over time. For example, departmental grants have increased from \$1.8 to \$2.8 million over the past five years. Continual investment in additional research and extension capabilities, particularly in areas such as genomics, plant breeding, physiology, and post-harvest, is necessary to reach the goal of competing with Michigan State, Cornell, and U.C. Davis as an elite horticulture program; hence the recommendation of "growth and investment" for the research and scholarship and outreach and engagement program areas.

Undergraduate enrollment in horticulture programs is below its potential. Several programmatic and curriculum modifications have been made to address this shortcoming, including the introduction of an environmental/urban horticulture program to be offered through our research and extension center in Puyallup, a landscape design option, and a viticulture and enology major. Graduate enrollment also is below expectations, given the size of the faculty. As with other plant science programs, consolidation of graduate programs to form interdisciplinary programs of national stature is a projected outcome (e.g. plant genomics, genetics and breeding). An alternative future of "reorganize, consolidate or reduce" is recommended for the area of teaching and learning.

Landscape Architecture. The undergraduate program in LA is very healthy as measured by enrollment, demand for graduates, and quality. The graduate program has recently been restructured and enrollment has increased 40% in the last three years. It is difficult to ascertain research productivity of LA faculty from the self-study as research statistics are reported for the entire department. LA faculty and students are actively engaged in outreach and engagement as described in the self-study document. An alternative future of "maintenance" is recommended in the area of teaching and scholarship, while "reorganize, consolidate, or reduce" is proposed in the other two areas to emphasize the need for evaluation of the inclusion of landscape architecture in a possible reorganization of design disciplines into a single unit.

Department of Human Development

(Teaching & Learning = M, Research & Scholarship = M, Outreach & Engagement =RCR)

The Department of Human Development (HD) and its predecessor units have long been known for strength in undergraduate education; however, in the last seven years, the department has made major strides towards building a foundation for future success in research and graduate education. HD is a low-cost (average starting faculty salaries, few senior faculty members, and limited operating expenses), high enrollment undergraduate program with one of the lowest instructional expenditures per student FTE within the university. Its undergraduate program is of high quality by all measures – curriculum quality, time to degree, program demand, employability of graduates, etc.

The overarching goal for the department is to continue this trajectory of growth in research and graduate education, while maintaining its strong record of accomplishments in undergraduate education and outreach. The department's recent record of accomplishment in these areas is impressive. Over the past four years, HD has the highest growth (32%) in MS enrollment among 13 comparable social science and education programs. While research productivity measures are lower than several other CAHNRS units (particularly relative to the larger, better financed agriculture programs), the performance of newer faculty in procuring extramural funds and authoring refereed articles is very encouraging. This unit is clearly on

the right track to execute transformational change in its research and graduate programs.

Through a decade of investment in Pullman and WSU-Vancouver, the HD faculty has grown to a size commensurate with establishing a strong, nationally recognized program. We do not anticipate large new allocations of resources to this program; however, we will continue to redirect current resources to advance graduate programming and research.

Department of Interior Design

(Teaching & Learning =M, Research & Scholarship = RCR, Outreach & Engagement =RCR)

Interior Design (ID) is a fully accredited undergraduate program, and the self-study report provides an excellent program justification based upon quality, internal/external demand, size, and productivity. The program is targeted for short-term growth of faculty because it is currently under-resourced in terms of faculty FTE. However, this resource gap is projected to be short-term, and long-term growth of the program is not projected.

Research and scholarly productivity of the ID faculty is on par with similar departments at peer institutions, but below most units in CAHNRS. This level of productivity reflects both heavy instructional demand on departmental faculty, and the diversity of research and creative activities within ID, many of which are not comparable to other units in the College. The Department of Interior Design does not have formalized Extension programs; however, its faculty has successfully extended its reach into the community, particularly through work at WSU-Spokane. Both research and outreach activities should be strengthened in the future, as the unit has much to contribute to WSU sustainability initiatives. An alternative future of “maintenance” is recommended in the area of teaching and scholarship, while “reorganize, consolidate, or reduce” is proposed in the other two areas to emphasize the need for evaluation of the inclusion of interior design in a possible reorganization of design disciplines into a single unit (see Landscape Architecture above).

Department of Natural Resource Sciences

(Teaching & Learning = RCR, Research & Scholarship = RCR, Outreach & Engagement =RCR)

The Department of Natural Resource Sciences (NRS) is an interdisciplinary unit that addresses a wide range of program areas, including forestry, wildlife sciences, range management, landscape ecology, aquatic ecology, and resource sociology. Natural resources are important to the state’s economic future and the quality of life of Washingtonians, and environmental issues continue to become more important to society. The enigma facing NRS is similar to that facing WSU as a whole – an overall under-investment in natural resource and environmental programs and the distribution of existing resources across a broad range of subject matter areas. In the case of NRS, 16 tenure-track faculty and supporting staff are attempting to address a span of program areas that are covered by an entire college at many land-grant institutions.

Aggregate metrics for the unit’s undergraduate program appear adequate. Graduate program metrics (enrollment, number of graduates, SCHs) are below expectations. Pockets of excellence exist within NRS research and outreach programs (e.g., wildlife sciences); however, the unit’s aggregate research productivity, expressed in terms of extramural funds and refereed publications, ranks 7th and 8th, respectively, among WSU’s eight agriculture/natural resource units. The self-study points out that considerable improvement in these areas have occurred over the past five years “as a result of changes in college and university expectations.” This improvement is observable and documented, but it does not appear to have significantly raised the department’s stature within CAHNRS or among peer departments.

The Department of Natural Resource Sciences (NRS) faces a challenge quite similar to many other environmental and natural resource programs at WSU – identifying and developing focused areas of excellence. While past efforts have reduced the breadth of its programs, it remains the case that the unit is too broad to define distinct and marketable areas of national preeminence. A case in point is the area of forestry. Without a massive infusion of new resources, WSU can hope to be ranked no higher than 4th in the Pacific Northwest among forestry programs. A “phase out” is recommended for this area, with resources reallocated to higher priority areas (e.g., water resources) where some comparative advantage can be realized.

As stated in the self-study, “no single aspect of the department is particularly strong when viewed from a disciplinary perspective....its greatest potential lies in becoming a stronger multidisciplinary unit with a limited number of areas of primary emphasis.” Over the past seven years, NRS has been involved in several attempts to develop a larger inter-college natural resource/environmental science unit, and serious discussions are ongoing involving units in CAHNRS and the College of Sciences with this intended outcome. Therefore, an alternative future of “reorganize, consolidate or reduce” is recommended across all three program areas.

Department of Plant Pathology

(Teaching & Learning = RCR, Research & Scholarship = M, Outreach & Engagement = M)

The Department of Plant Pathology (PPath) is an important component of WSU’s world-class plant science efforts. Because of the importance of high-valued crops to Washington’s agricultural sector and the state’s unique and varied climatic conditions, management of plant diseases is critical to the industry’s long-term sustainability. PPath has a sustained record of accomplishment in research and outreach as measured by extramural funds, publications, faculty award and recognitions, and service to the industry. The unit ranks third among CAHNRS units in refereed publications per FTE, but only 6th (among 9 agriculture/natural resource units) in extramural funds per FTE. PPath’s extension and outreach activities are among the finest at WSU and are highly productive based upon all relevant metrics. While the self-study does not provide data relative to peer institutions, faculty size in Plant Pathology is believed to be comparable to top-tier peer institutions.

The undergraduate program in PPath was eliminated several years ago, allowing the unit to focus on graduate education. Given this focus and the size and quality of the faculty, just about all graduate education productivity measurements [enrollments (MS = 7, PhD = 13), graduates (MS = 3.2, PhD = 2.8), and graduate SCH (634)] fall below expectations. One potential explanation for this shortfall is the fact that over half of the unit’s faculty reside at off-campus research and extension centers, which creates challenges (although not insurmountable) in engaging in graduate education. As with other plant science programs, consolidation of graduate programs to form interdisciplinary programs of national stature is a recommended action; hence, the proposed alternative future for teaching and scholarship of “reorganize, consolidate or reduce.”

Department of Statistics

(Teaching & Learning = RCR, Research & Scholarship = RCR, Outreach & Engagement = RCR)

Statistics plays a critical role in many programs throughout the university. The department provides a number of service courses, with SCHs in these courses nearly doubling between 2003 and 2007. Its M.S. program supports several doctoral programs, as the lion’s share of its enrollment is comprised of students pursuing a doctorate in another field. Statistical consulting activities with faculty and graduate students support research programs across the university, and are particularly critical to agricultural and natural

resource programs in CAHNRS.

WSU as an institution needs to engage the Statistics faculty to determine the appropriate organizational structure and role for the unit in a university striving for an AAU profile. Despite its distributed model (faculty administratively and geographically located in three different departments across three colleges), the faculty work well together and remain productive. However, this model seems to perpetuate a service orientation and is not conducive to the advancement of the unit's own distinct mission and the disciplinary scholarship. This structure also has prevented the unit from focusing its research efforts to define areas of preeminence for which it is nationally recognized. An effort should commence to integrate all faculty appointments related to statistics and all statistics courses into a single administrative unit. Such a structure would provide the critical mass necessary to develop core strength in statistics consistent with an AAU institution and maintain the critical service roles that the unit currently provides. Hence, the alternative future recommended across all three areas is "reorganize, consolidate or reduce."

Research and Extension Centers

CAHNRS operates four research and extension centers located in key agricultural production regions across the state. Each of these interdisciplinary centers is comprised of faculty from several agricultural and natural resource departments, with the explicit purpose of conducting research and outreach programs directed toward the unique agricultural and natural resource issues of the region. These assets are critical to the delivery of WSU's agricultural research and extension programs to agricultural producers and agribusinesses throughout the state.

Significant downsizing of the number of research and extension centers has already occurred. Over the past five years, the number of centers has been reduced by a third with the elimination of CAHNRS funding for centers in Long Beach and Vancouver. These actions were necessitated by fiscal shortfalls, leading to an inability to maintain the physical infrastructure or support annual operating expenditures for research activities. Resources and faculty have been consolidated into the remaining four centers.

The greatest challenge facing the continued operation of the four research and extension centers is deferred maintenance of the physical infrastructure. The majority of these facilities are 60 to 100 years old and are in desperate need of renovation. Capital improvement plans have been developed for each center, and include many basic infrastructure needs (e.g., water, power supply, roofs). Financing these infrastructure improvements will be a challenge. While WSU Facilities Operations provides some assistance, the majority of the fiscal responsibility for the maintenance of these facilities rests with the college. Maintenance and operating budgets for these centers are inadequate and will need to be increased as well, if the research and extension centers are to continue to address their expanding mission. Therefore, alternative futures are proposed for each research and extension center in two areas: research and outreach programs and facilities and operations.

A high priority for the College is to develop the infrastructure and support systems required to enhance opportunities for faculty at research and extension centers to participate in course delivery and graduate student training through enhanced distance delivery options. To fully access expertise and generate synergy among faculty across campuses and centers, acceptable methods of consistently delivering high quality courses through distance delivery methods must be developed.

Irrigated Agriculture Research and Extension Center at Prosser (Research & Outreach = M, Facilities and Operations = G&I)

The Irrigated Agriculture Research and Extension Center (IAREC) is the largest of WSU's research and

extension center and principally serves the irrigated production region in south-central Washington. It also houses the majority of WSU's viticulture and enology faculty and programs, the Center for Precision Agricultural Systems, the Agricultural Weather Network, as well as USDA, WSDA, and EPA programs. IAREC is a high valued asset based upon several research and outreach criteria – centrality, external demand, internal demand, cost effectiveness, etc. Research productivity of the Center is acceptable (not outstanding) when applying measures such as extramural funding and refereed publications. IAREC faculty provide high-quality, high-impact extension programs throughout the state.

IAREC is a critical facility if WSU is to continue to advance its agricultural mission and advance its global preeminence in plant sciences. Several new and reallocated faculty and staff positions have been added to IAREC over the past three years. In fact, the facility is currently operating beyond its capacity to house research programs. Among the four research and extension centers, IAREC likely represents the greatest challenge in terms of needed infrastructure improvements; therefore, significant investment is needed in facilities maintenance/renovation and operations in support of research activities.

Northwestern Washington Research and Extension Center at Mt. Vernon

(Research & Outreach = M, Facilities and Operations = M)

The Northwestern Washington Research and Extension Center (NWREC) is the smallest of the four research and extension centers and is envisioned to be WSU's principal agricultural production research facility in western Washington. The NWREC has benefited from recent investment in a new primary building (Agricultural Technology and Research Building) which was dedicated in 2006, the acquisition of a residence for housing graduate students, 20 acres of additional land, and new greenhouse facilities. A significant share of this investment capital was provided by local stakeholders. In addition, four faculty (two new and two transfers) have been added over the past four years. Historically, the NWREC has provided outstanding outreach programs in support of the Northwest Washington agricultural industry, while research productivity has been lower than other research and extension centers. New investment in facilities and faculty has been focused on expanding the research and graduate education mission of the Center. Due to new faculty and facilities, it is difficult to draw many inferences about future productivity of the Center, based upon past performance metrics. Because of recent investment in facilities and faculty, an alternative future of "maintenance" is recommended.

Puyallup Research and Extension Center

(Research & Outreach = M, Facilities and Operations = G&I)

The Puyallup Research and Extension Center's location in the heart of the Puget Sound region has led to an expansion of its portfolio of research and outreach programs well beyond production agriculture. Programs at the Center span across all three of the College's major programming thrusts: agricultural, human, and natural resource sciences. The Center also serves as an urban hub for WSU distance learning programs, non-credit programs, conferences, and workshops. The self-study document provides an excellent summary of the breadth of programs offered through the Center, and their multiplier effect through the generation of extramural funding from a variety of public and private sources. The array of programs, the level of funding, and the impact of the programs is impressive.

Building upon past accomplishments, the Puyallup R&E Center has crafted a new mission oriented toward research and outreach programs supporting the development of sustainable communities. This direction is complementary with WSU's current initiatives around sustainability and clean-tech, and the Center can play a major role in providing an urban laboratory for the discovery and dissemination of sustainable technologies. Implementation of this vision will need to involve the location of faculty, staff, and graduate students from a variety of departments and colleges at the Center. Therefore, the university

as a whole must embrace this “sustainable development laboratory” concept for the vision to be realized. Like the other research and extension centers, significant investment in facilities infrastructure will be required to continue operations at the Puyallup Research and Extension Center.

Tree Fruit Research and Extension Center at Wenatchee
(Research & Outreach = M, Facilities and Operations = G&I)

The Tree Fruit Research and Extension Center (TFREC) is critical to WSU’s efforts to continue to advance its horticultural programs to an elite status in the U.S. (see “Department of Horticulture and Landscape Architecture” discussion above). Its faculty and staff conduct a productive interdisciplinary research program and provide outstanding outreach programs to the state’s internationally acclaimed tree fruit industry. Research productivity at TFREC (as measured by research grants and publications per faculty FTE) is the highest among the four research and extension centers. As with IAREC and the NWREC, advancing the strategic vision for TFREC does not require significant additional investment in faculty positions; however, investment is needed in facilities maintenance/renovation and operations in support of research activities.

Subject Matter Centers

Agricultural Weather Network
(Research & Outreach = M, Facilities and Operations = M)

WSU’s Agricultural Weather Network (AWN) is a new organizational entity, having been spun off from the Center for Precision Agricultural Systems in 2006. AWN includes 96 weather stations, located throughout Washington State, which provide weather data updates approximately once an hour. Data stored on a central server is available for download and analysis through a sophisticated web site featuring decision tools, mapping software, and other features. Funding for initiation of AWN came from agricultural commodity groups as well as from a legislative appropriation earmarked for this purpose. While AWN data was envisioned for use principally by agricultural producers, the data network is being utilized by researchers, agencies, water districts, business, and media. ANW is a critical component in WSU’s vision to deliver research-based information technologies to the agricultural sector. State funds allocated to AWN were allocated two years ago and are “provisoed” for the program; hence, funding for the program cannot be redirected to other uses. An alternative future of “maintenance” is recommended.

Center for Sustaining Agriculture and Natural Resources
(Research & Outreach = M, Facilities and Operations = not applicable)

The Center for Sustaining Agriculture and Natural Resources (CSANR) has been highly successful in its mission of facilitating, networking, and funding sustainable agriculture, food, and natural resource systems research and outreach at WSU. CSANR is clearly recognized as one of the top sustainable agriculture centers in the nation. It has an excellent record of attracting extramural funding for its programs and facilitating grants and contracts involving WSU faculty and external partners. Its faculty and staff have received numerous recognitions for their work. CSANR should be “front and center” in as WSU advances its clean-tech and sustainability initiatives. State funds were recently allocated to CSANR and are currently “provisoed” for the program. An alternative future of “maintenance” is recommended.

Center for Precision Agricultural Systems
(Research & Outreach = G&I, Facilities and Operations = G&I)

The Center for Precision Agricultural Systems (CPAS) was started in 2000 with funding from the Washington Legislature and focuses on the application of high-tech solutions to some of the greatest

problems facing agriculture – soil conservation, biofuels, water management, labor availability, and farm worker safety, to name a few. CPAS is a critical link in WSU’s mission to assure the competitiveness of its high-valued agricultural sector through research and technological innovation. Recent investment in support of CPAS has included a new Agricultural Technology Building at IAREC (Prosser) and a new senior faculty position. Additional investment is required in additional faculty (appointed in the Department of Biological Systems Engineering) and staff and the completion of the building to advance this important agenda. Execution of this plan should place WSU as a national leader in the area of precision agriculture, particularly applied to horticulture production.

International Marketing Programs for Agricultural Commodities and Trade

(Research & Outreach = RCR, Facilities and Operations = not applicable)

IMPACT is currently being refocused to address a broader research and outreach agenda than agricultural international trade. It will be administratively located in the School of Economic Sciences and will take on a broader agenda of economics outreach and economic development. IMPACT is seen as a critical resource for the advancement of WSU’s economic development agenda, and discussions are ongoing with John Gardner, VP for Economic Development and Extension, as to how best to structure IMPACT’s resources and activities to support these efforts. IMPACT is supported by a USDA Special Research Grant, competitive extramural funds, contracts, and state funds that established the center in 1985. State funding to IMPACT has been reduced as part of the College’s strategy in meeting the recent 2.5% budget reallocation; hence, the alternative future of “reorganize, consolidate, or reduce.”

Interdisciplinary Academic Programs

Agricultural and Food Systems Bachelor of Science Degree Program

(Teaching and Learning = M)

Initiated in 2006, Agricultural and Food Systems (AFS) is an interdisciplinary, cross-departmental degree program which marked a new direction in CAHNRS undergraduate teaching efforts. The degree is visionary in its concept and curriculum, focusing on the broader context of the food system, as opposed to disciplinary foci. In its inception, the AFS degree replaced five separate degrees with a single degree with five separate majors which share a common core of classes. It is envisioned that AFS will serve as a principal component of future undergraduate agricultural programs at WSU, and additional small disciplinary degree programs will be subsumed by the AFS degree over time.

Molecular Plant Sciences Doctoral Program

(Teaching and Learning = G&I)

The Molecular Plant Sciences (MPS) doctoral program is one of the most successful interdisciplinary graduate programs at WSU and consistently ranks as one of the elite of such programs in the U.S. While the program is university-wide, it is administered within CAHNRS, and the majority of its students are advised by CAHNRS faculty. MPS serves as the model which the College tends to emulate in other plant science areas (e.g., plant breeding and genetics). The MPS faculty and administration have developed a unique “area of strength” concept to further advance the program and broaden faculty involvement. Additional resources will allow WSU to further advance this program and continue to build doctoral education in concert with excellence in plant sciences.

Master of Science in Agriculture Degree Program

(Teaching and Learning = M)

The Master of Science in Agriculture (MS AG) is an interdisciplinary, distance learning program which

targets the agricultural professional, practitioner, and educator. An internal review of the MS AG program was completed in 2006 and provided several important curriculum and administrative recommendations. This program is an important component to the College's strategy to grow its graduate enrollment and expand the involvement of faculty, particularly those at off-campus research and extension centers, in graduate education. Significant resource infusions are not necessary to implement this strategy; hence the "maintenance" recommendation.