

Review Team Report

University of New Mexico
Department of Civil Engineering
March 2009

Farhad Ansari, University of Illinois, Chicago
David W. Johnston, North Carolina State University
Eric N. Landis, University of Maine
Olen Paul Matthews, University of New Mexico, Geography

Summary Recommendations

1. It is reasonable to maintain graduate programs in all the major areas of civil engineering and in construction engineering and management. The transportation engineering area of graduate study and research would appear to be an opportunity area important to the State of New Mexico that is currently weak. The structures/materials and environmental/water resources areas are in the best position to achieve increased prominence considering facilities and opportunities.
2. The faculty appears to have healthy internal relationships, well respected leadership, and rekindled energy from the new facility allowing for better recruitment of new faculty and students. The department compares well with public university peer departments of similar size and is well positioned for higher achievement as a result of the new facilities for education and research. It will be important for the university to continue assisting faculty in their efforts to acquire and maintain state-of-the-art equipment for education and research. Our recommendation is that it is most important that the department establish its outlook and direction based on values that will best serve its students, faculty, and external constituencies.
3. As previously noted, transportation is perhaps the weakest of the currently offered graduate sub disciplines in the department. To elevate this capability, the department would need to devote resources (specifically replacement positions) to this area.

Documentation of Visit

The Review Team visited the department and the campus on the 9th, 10th, and 11th of March 2009. Prior to arrival, the team members were provided with both electronic and hard copies of the Department's self study report. The document was well written, comprehensive, and thorough.

State of the Department

The Review Team found a productive, well functioning department. Its 17 full-time faculty and 4 full-time staff deliver comprehensive undergraduate and graduate programs. Indeed, the department's offering of three separate accredited undergraduate degrees is particularly

impressive for a department of this size. The new building provides exceptional infrastructure for both teaching and research missions.

Below is a list of general observations made by the Review Team.

- There is good cohesion among faculty and staff. There exists a sense of community and a spirit of cooperation. The leadership is well respected.
- Students are appreciative of the efforts of faculty, the elements of the program, and the new facilities. Any complaints were beyond the borders of the department. Graduate students are clearly experiencing an appropriate research environment. Community building has been enhanced by the new facilities. Undergraduates would like to have access to computer labs after normal building hours. Some graduate students did not understand the variations in stipend levels that are perceived to exist.
- The efforts of the long-term faculty in sustaining the academic and research programs through many years with limited resources and facilities and in laying the foundation for the future through new faculty recruiting and facility development are to be applauded.
- The new facilities offer world-class teaching laboratories. In addition, the building design enhances community building among the students and faculty. The new research laboratories will provide opportunities to increase research and funding that were not previously available. This will lead to improved recruitment and retention of graduate students & faculty. Faculty have clearly been aggressive in procuring new equipment and instrumentation that will further enhance research opportunities.
- The department has been extremely successful recruiting new faculty with active research agendas. The successes of these faculty is clearly making a mark on the department, and are playing a role in transforming the direction of the department towards a heavier emphasis on research.
- Each of the emphasis areas of the department is critically important to the State of New Mexico. The faculty are visible in many of their public outreach activities and interactions with industry and government agencies.
- The department is covering an extremely broad range of disciplines for a group of its size and available resources. As a result, the department is facing a dilemma between maintaining the breadth necessary to serve the needs of the state, and the focus that may be required for advancing a stronger research agenda in selected areas. The teaching loads of the faculty are high compared to research intensive peer departments.
- The program curricula are sound and appropriate. In view of the additional department degree programs in construction engineering and construction management and the possible need for the environmental engineering specialty in civil engineering to be more visible versus other campus degree programs in environmental science and in environment planning and design, the faculty may want to consider renaming the department Civil, Construction, and Environmental Engineering to provide better visibility to these areas of strength.
- The faculty are active in public service, providing visibility to the department, college, and university.

Questions Asked of Review Team

As a part of the departmental review process, the Review Team was asked to address specific questions that are relevant for planning purposes. These questions, along with the Review Team responses, are presented below.

Question 1: “Should we continue to offer and support graduate programs in all our current sub-disciplines, or begin to concentrate resources into particular focus areas?”

The Review Team found the department to be poised for a time of transition. The coming years will bring changes in faculty personnel, and these changes will offer opportunities for enhancing the research mission, building graduate programs, and serving various needs of the State. The department has previously been hampered by old, outdated facilities, even while the university was working to elevate its stature as a research university. Ultimately, the answer to this question requires a serious dialog both within the department and with its various constituencies. The outcome of this dialog will be a transition plan that sets the course for the department. The Review Team sees the trade-offs as follows.

The UNM Department of Civil Engineering is medium to small sized among state university civil engineering departments. As such, it cannot promote extensive research programs in all sub-disciplines of civil engineering. Successful programs of comparable size tend to identify areas of excellence in which they can excel. While the department currently has faculty with varying levels of research activity in all areas, it appeared that the structures/materials and environmental/water resources areas were the most active, while transportation was the least active.

Typically for a research group to achieve national or international prominence, a critical mass of faculty expertise is required. While the definition of critical mass is not necessarily fixed, and indeed it can vary within a discipline, one could suggest that a minimum of four faculty members in the area are necessary. (It should be emphasized that not all faculty must be housed in the same department, and indeed, a cross-discipline aspect is normally viewed as a positive.)

With this in mind, the review team recommends promoting areas of existing or emerging strength (structures/materials, environmental/water resources). At the same time it needs to be recognized that civil engineering departments have the dilemma of needing to provide education at the undergraduate and graduate level for many specialties and the ultimate success of faculty often depends on having at least a viable graduate program for each area.

Question 2: “In your estimation, how does the department compare with Civil Engineering departments in other state universities?”

The Review Team found the department to be a healthy, active group, with a diverse portfolio across the teaching, research and public service enterprises. This is important, as there is no obvious weakness. All faculty appear to be making important contributions. With respect to relative standing, the lack of weaknesses puts the department in a respectable position relative to peer institutions. As in most departments there are variations across specialty areas in teaching loads and research opportunities that must be weighted and balanced fairly for overall success.

While there are no obvious weaknesses, there also does not appear to be a particular area where the department could be said to have a strong national or international impact. Clearly there are

individual faculty members who have excellent national reputations, and perhaps more importantly, there are young faculty who are emerging as prominent scholars. As individuals, however, their influence on the department's national standing will nearly always have limitations. As we have noted, for a medium-to-small department to have a national or international reputation, there needs to be a particular area where a critical mass of faculty are working together in a complementary way so that they are truly making an impact on the discipline. It appears the UNM Civil Engineering Department has the basic infrastructure and personnel to consider investments in strategic areas where it can really make an impact. As alluded to above, such a consideration will require a dialog that involves the full range of constituencies, but hopefully not involve redirecting resources in such a way that other core areas are compromised.

Our recommendation is that it is most important that the department establish its outlook and direction based on values that will best serve its students, faculty, and external constituencies. They should not make decisions based on a misguided pursuit of fickle and flighty rankings.

Question 3: "Do you see opportunities that the department is not presently capitalizing on to the extent possible?"

There are several opportunities the Review Team identified that the department could pursue, although none of these are necessarily new to the department faculty. The department has established good relationships with researchers at local federal research facilities, and there is no reason why these relationships cannot be enhanced.

The review team talked at great length about the opportunities to expand transportation research. The reason for this is that many state university civil engineering programs have good relationships with their state departments of transportation. Indeed, the relationship is frequently a fruitful one that typically leads to support of a steady research program. In discussions with faculty, it was clear that a variety of past political issues have prevented the New Mexico Department of Transportation from establishing steady relationships with either of the main state universities. However, it was noted that some recent changes in DOT management could open the door to future collaborative relationships that could benefit UNM CE department faculty and students. Having a transportation group with a strong DOT research relationship often also improves DOT research opportunities for other areas (construction, geotechnical, materials, etc.) as well.

That said, as has previously been noted, transportation is perhaps the weakest of the currently offered sub disciplines in the department. Thus the department would need to devote resources (specifically replacement positions) to this area, which may limit the impact department faculty are poised to make in other areas. The department can consider examples where one or two transportation faculty members can succeed in maintaining a viable, albeit limited research program, while the remaining transportation faculty lines are considered for reprogramming.

Conclusion

The review team found the UNM Civil Engineering Department to be a well functioning, productive group. The overall research productivity and professional impact is on an upward trajectory, and there is no reason this trend cannot continue. The review team very much enjoyed its visit with the students and faculty in the department and the helpful perspectives provided by

the College and University administrators and staff on the objectives of the academic program review. We hope the recommendations and observations provided will be helpful to the faculty and administration in advancing the programs of the department.