

MEMORANDUM

TO: Dr. Jorge Vanegas
Interim Dean, College of Architecture

CC: Walter Peacock
Interim Executive Associate Dean

FROM: Joe Horlen
Head, Department of Construction Science

DATE: November 7, 2008

RE: Research Roadmap, Department of Construction Science

The purpose of my writing is to share with you the thoughts of the Department of Construction Science with regard to the Roadmap for Academic Excellence, beginning with the Research Roadmap. In preparing the information included here we have gathered input by each of the following methods:

- A series of Construction Science faculty meetings;
- A number of focus group meetings by a departmental faculty Research Roadmap Task Force;
- Focus group meetings of members of our Construction Industry Advisory Council during the regular meeting of the Council last week;
- Focus group meetings of Graduate Students in our program.

We are presenting here a recapitulation of the information gleaned from each of these constituencies. Further, in presenting this information, we have followed the protocol which was established by the Provost, that is, responding to the inquiries posed by the Provost.

I would also note for your reference that a number of Construction Science faculty members already have "White Papers" in preparation as part of the process outlined by the Provost with regard to collaborative research efforts they plan to engage. Additionally, a number of other faculty are planning to prepare "White Papers."

The information gathered from the process described above is presented in the paragraphs which follow.

1. *“What are this (Department’s) three to five greatest research strengths?”*

We believe we have the expertise on Construction Science faculty to make noteworthy research inroads in the areas noted below. Further, we believe that the faculty have, or could generate, networks with other experts and researchers in related disciplines, so as to be able to form rich collaborative research teams in these areas.

1. Maintenance and reconstruction of existing buildings, including historic buildings

Including aspects of Building Information Modeling (BIM)

Including consideration of Green Construction, and Leadership in Energy and Environmental Design (LEED) Standards

In design, materials selection, mechanical and electrical systems, and reconstruction;
Energy efficiency in retrofitting;
Energy conservation during construction (or re-construction);
Life cycle costing, utilizing BIM technology, for the building, as well as for its materials and systems;
Recycling of materials, in and from the existing building, as well as waste from the construction or re-construction.

2. Aspects of energy conservation and sustainability associated with the design and construction of new buildings, as well as the design, construction, renovation, adaptive re-use and reconstruction, and facilities management of existing buildings, to include historic buildings

Including aspects of BIM and LEEDS, as noted above

Including considerations of public safety, safety on the jobsite,

and recycling, during demolition of buildings, or part of buildings (as for remodeling and restoration and adaptive re-use)

3. Interpretation of data and formulation of recommendations from information gathered in Building Condition Assessment Surveys

Given the multi-disciplinary expertise of departmental faculty (Including expertise in architecture; engineering; historical restoration and renovation; mechanical and electrical systems; materials and methods employed in design and construction; construction project cost, and estimating and scheduling; construction project controls; land and urban planning; interface with various levels of government during design and construction; legal aspects of design and construction, to name a few), we believe that we have a rare blend of talent housed within our department which could be of enormous assistance in the interpretation of data as well as in the formulation of conclusions and recommendations from building surveys and assessments of condition such as those being conducted on the Texas A&M University campus.

We believe this research could be of great value in the formulation and maintenance of the Campus Master Plan and would prove invaluable assistance to campus entities such as Facilities Planning and Construction and Physical Plant.

4. Application of Lean Construction concepts and methodology to new design and construction as well as to the design and construction for restoration, renovation, remodeling, adaptive re-use of existing buildings
5. The topical areas noted above are considered the “top four” areas of greatest research strength for the Department.

Others would include:

Construction Visualization

Information Technology and Interoperability

Chemical Visualization of Construction Materials at the Subatomic

Level

Radio Frequency Identification for Use in Supply Chain Management on Construction Projects of all Kinds

Business Practices for Construction Firms

Including elements of business capitalization, interim and permanent financing of construction projects, personnel relations and personnel management, consolidations and rollups, etc.

Research regarding effective teaching in university programs and in outreach programs of construction topics, including Project Management, Project Supervision, and numerous other topics in the Construction Science discipline

Safety and health of workers and the general public during construction and of building occupants in completed buildings

2. *What are this Department's "rare" research strengths?*

2. Building Information Modeling (BIM) expertise.
3. Expertise in Leadership in Energy and Environmental Design (LEED) standards, methodology, and applications.
4. Expertise in Information Technology and Interoperability
5. Expertise in Chemical Visualization
6. The rare blend of interdisciplinary talent and networking as well as demonstrated capability in establishing and maintaining functional and effective multidisciplinary teams which are represented on the departmental faculty.

The blend of multidisciplinary talent and expertise referenced above include expertise in architecture, engineering, historical restoration and renovation, mechanical and electrical systems, materials and methods employed in design and construction, construction project cost, and estimating and scheduling, construction project controls, land and urban planning, interface with various levels of government during design and construction, legal aspects of design and construction, to name a few.

