MPC-385
Educational and Workforce Development Proposal: STEM Outreach at Colorado State University January 1, 2012 – December 31, 2012

1. Description of Proposed Activities:
Colorado State University recently launched the CSU STEM Center. This center is devoted to enhancing teaching at the K-12 and undergraduate levels, with a great deal of emphasis placed on the preparation of teachers in STEM fields. As part of the MPC activities at CSU, we will partner with the STEM Center to teach teachers about transportation, so they in turn can reach many K-12 students. Undergraduate students in the Department of Civil and Environmental Engineering will be hired to help prepare activities related to the importance of transportation infrastructure (based in part on the research projects conducted at CSU) for K-12 teachers to use in their classrooms. The CSU STEM Center will help us ensure that the activities developed meet Colorado curricular requirements so that they can be readily adopted by teachers. The activities will be designed in an active learning style, and will include simple physical demonstrations and assignments to promote critical thinking by students. We plan to develop activities appropriate for students in elementary and secondary schools. The STEM Center will help us reach audiences of teachers (pre-service teachers working on their licensure and working teachers in the region) to ensure that the activities are widely disseminated. The STEM Center can also provide evaluation efforts for these K-12 outreach components to ensure they are effectively reaching students.

These activities will help increase the awareness of transportation careers in elementary and secondary school children, and ensure that transportation is associated with STEM activities in schools. The activities will be designed to ensure that they are relevant and interesting to both boys and girls, in an effort to promote greater future representation of women in transportation. By involving undergraduate students to help prepare the activities we will be 1) helping these students themselves learn more about transportation fields and career paths, and 2) teaching the undergraduate engineers about the importance of outreach.

2. Outcomes:
We expect the project to produce transportation related STEM activities appropriate for four target grade levels (K-2, 3-5, 6-8 and 9-12). Furthermore, individual activities will be created for use in science and math courses. During the two year grant we hope to share the activities and lessons with at least 30 area teachers, allowing many students to be reached with the activities. The project will help current civil engineering undergraduates learn about the importance of sharing what engineers do with future generations and the general public. This project will also help establish a working relationship between the Department of Civil and Environmental Engineering at CSU and local schools. This relationship can be built upon in the future through additional UTC funding or other programs.

3. Strategic Need:
Although the outreach program is not intended to specifically address one of the five strategic goals, these goals and the research activities conducted at CSU to address the goals will serve as inspiration for development of the classroom activities. For example, the goal of environmental

sustainability could be readily adapted to fit into a science course, or the idea of livable communities might serve as the basis for a math activity looking at commute times and walking distances.

4. Resources Requested:

MPC Funds: $23,000
Matching Funds: $23,000
Source of Matching Funds: Faculty time for Dr. Thomas Siller, director CSU STEM Center