Spilka and Howard: The call of tomorrow's workforce

By **Sen. Karen E. Spilka and William S. Howard**
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Massachusetts has experienced a lot of bad weather lately - and the deluge has shown us how we depend on the basic infrastructure of a complex society. We need our roads to be solid, our electrical grid operational, and our dams and levees sound.

Government has the responsibility to invest in this system. At the same time, though, the structures are actually built by private industry and designed, created and maintained by scientists and engineers. Thus, a successful partnership between government and industry is critical to sustaining this system, and to guaranteeing a prosperous society.

The question is, from where do these scientists and engineers come? At the moment, they are right here. Massachusetts is fortunate to be home to some of the finest engineering firms in the world. Many of our companies are now in Louisiana figuring out how to shore up the levees, and the same companies will help us make dams right here in Massachusetts safe.

But as we look ahead, we see a problem unfolding: the engineering problems are rapidly becoming more complex, our infrastructure is aging, the baby boom engineering workforce is retiring, and not enough new engineers are coming along to replace them. From 1985 to 2004, the number of engineering degrees conferred in the United States declined from 85,000 to 76,000. Only five percent of all degrees awarded in the U.S. are in engineering. That is not enough, not nearly enough.

This is not true everywhere. China expects to graduate 500,000 engineers in 2006 - one-third of all degrees. With the annual overall Science Technology Engineering and Math (STEM) graduate population from American colleges and universities remaining fairly level over the past 20 years, companies have turned to foreign workers to fill the engineering gap. Yet, it has become harder for foreign workers to enter the United States, so Americans need to be able to fill those jobs - if we don't, the jobs themselves will go overseas.

Recent estimates denote a shortfall of 24,000 STEM skilled workers by 2009. Though initially overwhelming, such a daunting forecast inspires us to develop a strategy to refresh the STEM pipeline. Cambridge-based environmental engineering firm Camp Dresser & McKee Inc. (CDM) recently gathered 40 leaders from the environmental engineering industry, government and education to examine the anticipated shortfall in our STEM workforce. At the CDM workshop it became clear that the engineering schools expect to face the same shortfall as do the companies that hire their graduates.

To solve the problem we must look to our middle and high schools. We should strive towards twin goals: first, we must teach our kids advanced math and science; second, we need to motivate youngsters to become scientists and engineers.

We have hopeful progress on academic preparation. The SAT scores of Massachusetts students have been increasing steadily over the last decade. Just days ago the 2005 National Assessment of Educational Progress showed us that Massachusetts' students top the nation in reading and math achievement.

Our toughest challenge is increasing student awareness, interest and motivation.

The participants in the CDM workshop have agreed to do their part to address the STEM workforce problem. They are ready to support programs that are substantive, easily duplicated throughout the state, and measurable.

Work in MetroWest shows us what to do. The STEM High School Internship Collaborative, lead by the Metro South/West Regional Employment Board, reaches the student population. It uses internships with technology companies to create and sustain interest in STEM careers.

Businesses and school systems partner to provide students with critical early workplace experiences. Students have the chance to see first-hand the spectrum of employment opportunities, as well as the impact those jobs have on the world around them. Ultimately, if students know more about career opportunities and specific goals to work toward, their interest will be sustained as they develop the skills to achieve those goals.

The MetroWest/495 Corridor is filled with both potential and the resources to achieve that potential. Our region is home to some of the most prominent technology companies in the world, and our children are already among the best-educated Americans. By insisting on academic excellence in STEM education and showing students the vast range of career choices, we can, and must, develop a world-class workforce.

Successful public-private partnership proves once again that we are at our best as a society when we work together. Parents have an important role, too. The next time your child asks how to help the peoplein New Orleans or Taunton, tell her or him to become an engineer.

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