The outreach of engineering schools to our K-12 educational system is becoming an increasingly important priority. The competitiveness of our nation in the new global knowledge economy requires a highly educated workforce in the STEM (Science, Technology, Engineering and Mathematics) fields. Creating a well-oiled and dynamic pipeline for Engineering, in particular, is a key necessity for empowering the society with the new industries and businesses of the future.

Outreach occurs in a number of ways: from the direct involvement of engineering students (undergraduate or graduate) with K-12 students, the development of curriculum, teaching, mentoring and extra-curriculum activities; to the engagement of teachers at the various K-12 levels with our faculty, staff and students; to the development of innovative models for K-12 curricula and instruction; and to the support of the National Academy of Engineering “Changing the Conversation” initiative.

This report provides a snapshot of the various activities of the USC Viterbi School of Engineering in K-12 Outreach, an effort that we have dubbed Viterbi K-12. It is an effort that is growing fast and aims at the ultimate goal of “engineering empowering society” by making sure that “society is empowering engineering.”

Yannis C. Yortsos
Dean, USC Viterbi School of Engineering
The USC Viterbi School recognizes that we live in an unprecedented era — "the most exciting era for engineering and science in human history", in the words of President Chuck Vest of the National Academy of Engineering. There are 746,000 students in Los Angeles public schools, many from low-income, underrepresented minority families. These nearly 50 schools depicted below represent Viterbi’s STEM pathways to attract and retain the best students, the greatest diversity of thought and ideas in the second largest city in America.

**Viterbi K-12**

**STEM Pathways in the Heart of a Mega-City: Los Angeles**

USC was recently ranked the #1 "Good Neighbor" University in America for its strong ties with the local underserved community that includes educational outreach, service learning, health programs, and business development.

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**A CRITICAL NEED:**

Snapshot of USC’s Neighbors

- **44,513 people** in a 2.8 sq mile area
- **30.7% adults** with less than a 9th grade education
- **$23,887** median income
- **35.6% households** at or below federal poverty rate
- **49.7% adults** not in labor force or unemployed

**High School**

**Middle School**

**Elementary School**

**Center for Robotics and Embedded Systems**

Working with K-12 students all over Los Angeles, Viterbi’s programs have provided robotics curriculum development, teacher training, robot kits and lesson plans, as well as robot contest mentoring for events like FIRST robotics competition.

**The Engineering for Health Academy (EHA) at Francisco Bravo Medical Magnet High School**

As part of USC’s Biomimetic MicroElectronic Systems Engineering Research Center, EHA introduces 10-12th grade students to all aspects of biomedical engineering, including USC and industry research laboratories, experiential projects and university mentors and equipment.

**Ped-Tek at LEMA High School**

Can students learn math by creating video games? Supported by a NSF Creative IT award, computer scientists at the Viterbi School explore innovative ways to use technology to teach mathematics and 21st century skills to at-risk high school students.

**NSF GK-12 Award: Body Engineering LA**

Using the human body as the gateway to engineering topics from lever strength to viscosity, BE-LA will directly impact at least 45 graduate fellows, 45 teachers, roughly 2000 underserved 6th-8th graders and six participating schools over five years.

**NSF Research Experience for Teachers**

Inner-city Los Angeles teachers (grades 6-12) are immersed in cutting edge research — from robotics to nanotechnology. After six weeks in a USC Viterbi laboratory, they’ll bring their new found expertise and pedagogy back to the classroom.

**Viterbi’s K-12 Family of Schools**

- High School
- Middle School
- Elementary School
- Center for Robotics and Embedded Systems
- The Engineering for Health Academy (EHA) at Francisco Bravo Medical Magnet High School
- Ped-Tek at LEMA High School
- NSF GK-12 Award: Body Engineering LA
- NSF Research Experience for Teachers

**Long Beach Arena**

Site of FIRST Robotics competition (co-sponsored by Viterbi School)

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