Envisioning the Future of USC’s Information Technology Services
(Presentation to the USC Academic Senate)

I am delighted to be here to provide brief thoughts on supporting the great work of the faculty as the engine of excellence at USC.

To begin with, I would like to articulate my commitment to partnering with faculty directly to understand where we can contribute to their success—in scholarship and research, as well as teaching. I am working closely with the Senate’s Committee on Information Services (CIS), whose charge is to advise me on issues related to the university’s technology infrastructure, information technologies, and technology-related policies with an impact on academic matters, including research and teaching. Guidance from this committee is critical in helping ensure that we spend our precious resources on the right solutions at the right time. One way in which we will strengthen our partnership will be to develop a clear liaison to each school or college, so that we have a direct channel to the deans’ offices and the technologists, so that faculty do not have to know whether support comes from ITS or from the individual school.

Another key step is the development of a Strategic Plan for Information Services and Technologies in support of the USC Strategic Vision. This plan is not simply about ITS as an organization, but about how the Office of the CIO can work with you, the schools, and the administration to make the vision a reality. On that note, I would like to take a moment to recognize the two CIS chairs, John Silvester and Ray Mosteller, and thank them for their commitment and leadership. I have known John for many years as part of regional and national networking consortia, and I feel so welcomed by Ray and, of course, by Senate Chair Charles Gomer.

As you know, Provost Garrett has announced the new informatics initiative to build on one of the driving forces of the 21st century. The “University Initiative in Informatics and Digital Knowledge” will build on USC’s unique strengths in visualization and gaming, computer science, engineering, translational research, and the digital humanities. The initiative has a direct relationship to the transformative objectives of the USC Strategic Vision. My office, working with you, will support the paths charted by the USC Strategic Vision, especially these three: transforming education for a rapidly changing world, creating scholarship with consequence, and connecting the individual to the world.

As the USC Informatics Initiative unfolds, we have some excellent resources to build on. First, we have 100-Gb and high-performance networking via infrastructure and partnerships with local, regional and national centers, such as CENIC, Los Nettos, and Internet2. You may not be aware that USC was one of the first campuses nationwide to use this new level of performance in sharing data with other institutions. Our researchers can use this capability every day—whether in seismology, genomics, medical records, digital humanities, or cinema.

Second, our Center for High-Performance Computing and Communications (HPCC) ranks as the 5th-fastest academic supercomputer in the U.S. and 53rd-fastest of all supercomputers in the
world. Through the university’s investment in GPU technology, or graphics processing units, HPCC recently achieved a benchmark of 531.6 teraflops, or 531.6 trillion floating-point calculations per second. HPCC supports more than 110 research groups in a variety of disciplines, including epigenetics, geophysics, materials science, engineering, natural language translation, and health sciences. James Knowles, professor of psychiatry, and Peter Laird, professor of surgery and director of the USC Epigenome Center, have built the capacity to store and analyze over 800 terabytes of data through the HPCC condo system. Tom Jordan and the Southern California Earthquake Consortium, or SCEC, represent another large project using HPCC resources. Nobel laureate Arieh Warshel has also relied on HPCC resources for his research. While we cannot take credit for these faculty members’ amazing work, we must do everything we can to ensure that our faculty have adequate tools and technologies to reach new heights, that they have what they need to explore new questions in new ways. And we must ensure that we are a destination campus for the next Nobel Prize winners and National Academy members.

Third, the USC Digital Repository (USCDR) is leveraging the global reputation of the USC Shoah Foundation Institute to support new initiatives in new areas. The USC Digital Repository currently has 40 petabytes of on-site storage and will grow to 64 PB within the next few years. The USCDR offers secure and encrypted storage options that are mirrored between multiple locations. The USCDR offers fee-based storage agreements that allow USC researchers to meet the data-management-plan requirements of NSF and NIH grants; the cost of this storage can be written into grant applications. The USCDR is in use by researchers at the Dornsife College of Letters, Arts, and Sciences; Viterbi’s Information Sciences Institute; the USC Department of Preventative Medicine; and also by external customers.

Fourth, a word on grant support. My office regularly endeavors to support HPCC researchers applying for competitive grants. More than that, we are starting to bring disciplinary experts into our HPCC group so that our staff members are better able to understand the software and algorithmic strategies you and your colleagues may need to use HPCC systems well.

I am very proud to say that thanks to the combined efforts of Professor John Silvester and Maureen Dougherty, director of HPCC, USC received a $500,000 grant from the NSF to create the Trojan Express Network II, or TEN-II. This research and education project will provide USC researchers with a high-speed expressway to transfer massive amounts of data across and beyond campus with nothing but EZPass lanes. More than that, it puts us in a unique club that is looking at the roadmap for big data sharing across the country and the world.

Speaking of which, we are indeed entering the era of big data. Big data is not about size per se, but rather about problems that are at a scale where traditional algorithms, storage technologies, and visualization tools and other mechanisms for gaining insight no longer do the job. Often, we are dealing with unstructured or high-dimensionality data that requires new statistical approaches. USC is uniquely positioned to build its intellectual capacity and technology infrastructure to ensure that our faculty members have the provisions and tools they need as they scale the next intellectual mountaintop.
To succeed, my emphasis is first and foremost on partnership: with the faculty; with the colleges and schools, deans and technology professionals; with the Senate and its Committee on Information Services; with our students, who keep us innovating; and with other leading institutions worldwide. Through this partnership, we will do great things together. As stated in the USC Strategic Vision, this “is a call to every school, every department, every institute and every program to transform in ways that will create a university emulated by others.” I am here to join with you in answering that call.

Thank you.