MINUTES
of the
SECOND MEETING
of the
SCIENCE, TECHNOLOGY AND TELECOMMUNICATIONS COMMITTEE

July 25-26, 2016
Rotunda Room, University of New Mexico Science and Technology Park
801 University Boulevard SE
Albuquerque

The second meeting of the Science, Technology and Telecommunications Committee (STTC) was called to order by Senator Michael Padilla, chair, on July 25, 2016 at 10:01 a.m. in the Rotunda Room of the University of New Mexico (UNM) Science and Technology Park in Albuquerque.

Present
Sen. Michael Padilla, Chair
Rep. James E. Smith, Vice Chair
Sen. William F. Burt
Rep. Stephanie Garcia Richard
Rep. Jason C. Harper (7/25)
Rep. Conrad James
Rep. Bill McCamley
Sen. Bill B. O'Neill
Rep. Debbie A. Rodella
Rep. Carl Trujillo
Rep. John L. Zimmerman

Absent
Sen. Daniel A. Ivey-Soto
Sen. John C. Ryan

Advisory Members
Sen. Carlos R. Cisneros (7/25)
Rep. Kelly K. Fajardo
Sen. Ron Griggs (7/25)
Sen. Nancy Rodriguez
Rep. Monica Youngblood (7/26)

Sen. Jacob R. Candelaria
Rep. Antonio Maestas
Sen. Richard C. Martinez
Sen. Steven P. Neville
Sen. Mary Kay Papen
Sen. William H. Payne
Rep. Nick L. Salazar
Rep. Luciano "Lucky" Varela
Sen. Peter Wirth

(Attendance dates are noted for those members not present for the entire meeting.)

Staff
Gordon Meeks, Legislative Council Service (LCS)
Ralph Vincent, LCS

Guests
The guest list is in the meeting file.

Handouts
Handouts and other written testimony are in the meeting file.

Monday, July 25

Welcome and Introductions
Senator Padilla welcomed the committee to the second meeting of the STTC for the 2016 interim. Members of the committee and the staff were invited to introduce themselves.

Welcome to UNM
Gabriel Lopez, vice president for research, UNM, welcomed the committee to UNM and discussed his role in developing research activities at the university. Dr. Lopez discussed the vision to dramatically enhance UNM's research excellence and the current metrics showing the status of research funding. Dr. Lopez also discussed the Legislative Finance Committee (LFC) staff's recommendation to create an Industrial Relations Office to consolidate corporate relations at higher education institutions.

Questions and discussion from committee members included:

- branch campus participation in research;
- prioritization of research projects within UNM's capital outlay requests;
- joint appointments of staff between Sandia National Laboratories and UNM;
- collaboration among higher education institutions in corporate relations efforts;
- the impact on job creation and/or loss as technology from institutions of higher education evolves;
- the effectiveness of research projects and the metrics used to measure the results;
- the possibility of someone in private industry being advised or aided in research as a service from the university; and
- a one-stop portal at the university for finding specialized university resources.

Intellectual Property Development, Job Creation and Innovate ABQ
Elizabeth Kuuttila, president and chief executive officer, Science and Technology Corporation (STC), UNM, discussed the STC's role in creating opportunities for and supporting technology transfer projects. The metrics show a steady increase both of projects and money involved.

The following initiatives were highlighted:

- the Joseph L. Cecchi VentureLab, office space for new business, intern support, etc.;
- the STC's and the UNM Foundation's co-investment fund;
- a partnership with New Mexico Angels;
- a memorandum of understanding with Osage Venture Partners;
- Innovate ABQ, a business incubator; and
- the Innovation Academy and coursework related to entrepreneurial activities and business planning.

Questions and discussion from committee members focused on:

- the role that the State Investment Council could play in the investments with venture capitalists in start-up companies; and
- performance measures for start-up enterprise investments, including jobs created, tax revenues, the number of inventions and the number of contacts with venture capitalists.

Information Technology Status Report

Brenda Fresquez, LFC, provided the committee a spreadsheet of the progress of the Department of Information Technology (DOIT) in deploying and managing information technology systems among state agencies. The spreadsheet shows the DOIT's top-10 projects, plus two other projects: the Corrections Department's offender management system (OMS) and the Department of Public Safety's computer-aided dispatch (CAD) system.

A motion was made by Representative Garcia Richard and seconded by Representative Zimmerman to have this spreadsheet provided on a quarterly basis. The motion passed unanimously, and LFC staff will provide it at either the October or November meeting.

Information Technology Commission (ITC) Status

Darryl Ackley, secretary, DOIT, reported on the status of the ITC. Rather than concentrate on the ITC as it is directed in statute, DOIT staff is working with the Office of the Governor to provide policy oversight and is also conducting project certification through the Project Certification Committee (PCC), which was created by the ITC a number of years ago. Secretary Ackley presented a plan to move forward during the 2015 interim, but no direction has been adopted as yet.

A possibility would be to change the ITC to just an advisory board, with other oversight roles provided at the DOIT. Already, $200 million to $300 million worth of project oversight is being handled by the DOIT and the PCC.

Questions and discussion from committee members addressed:

- the functions of oversight by the ITC as specified in statute need to remain if any legislation is enacted to reform the ITC; and
- the independence of the ITC and a former chair's vision of what the oversight should be.

Members requested that Secretary Ackley define more clearly the responsibilities for policy oversight and make recommendations for the ITC. The members also requested Secretary Ackley to map the requirements in statute to a path going forward and to recommend how the PCC fits within a new structure. Secretary Ackley was requested to come back in September or October with recommendations on a path forward.

Opportunities for Enhancing Broadband Deployment

Senator Padilla asked that presenters invited to address the broadband issue sit at the witness table in three groups. Presenters were requested to be brief in outlining their organizations' roles and their needs for expedited broadband deployment and to limit remarks to seven minutes each.

Participants in addition to Secretary Ackley included:

—Mike Ripperger, Public Regulation Commission (PRC);
—Ovidu Viorica, Broadband Deficiencies Correction Program Manager, Public School Facilities Authority (PSFA);
—John Badal, Sacred Winds Communication;
—Katherine Martinez, Legislative Affairs Director, CenturyLink;
—Gil Gonzales, Information Technology Manager, UNM;
—John Francis, Executive Vice President, Western New Mexico Telephone Company; and
—Sam Ray, New Mexico Exchange Carrier Group.

The participants discussed broadband deployment relative to their respective organizations' current specific plans and what the legislature can do to help. Secretary Ackley discussed broadband deployment in general terms and introduced Kendra Karp, the new director of the Office of Broadband and Geospatial Initiatives at the DOIT. He summarized how broadband evolved and why it is talked about. He said one million gigabytes of internet traffic will go around the internet this year. Perennial questions, he said, include: how can more broadband be obtained to accommodate the growth and how can cybersecurity issues associated with data transmissions be handled? Secretary Ackley testified that the requirement for bandwidth is increasing by exponential numbers. The governor has an initiative to ensure that every child in New Mexico will have access to one megabyte of bandwidth by 2018. The administration also has significant requirements to provide sufficient broadband service for public safety and first responders.

Mr. Ripperger summarized the PRC's responsibility, which is mainly the regulation of intrastate telecommunications services. Traditional regulation has been over the "non-broadband" public switched telephone network (PSTN), operating through time division multiplexing. Broadband is primarily an internet protocol (IP)-based service. The Federal Communications Commission (FCC) has determined that broadband is largely interstate in nature and, therefore, primarily under FCC jurisdiction, he stated. The FCC decided to refrain from broadband rate regulation. Therefore, he said, pursuant to the FCC's Net Neutrality Order of April 3, 2015, the PRC does not assert authority over broadband services. However, he said that the PRC does assist with informal broadband billing complaints in its Consumer Relations Division. The PRC supports deployment of broadband services in New Mexico and has taken action to further that cause. It established the New Mexico Broadband Task Force to provide a report and action plan to stimulate the deployment of broadband in New Mexico, and the commission created a broadband fund as part of the State Rural Universal Service Fund. The commission also has the responsibility for the annual certification of eligible telecommunications carriers (ETCs) for the use of state and federal universal service funds for broadband and PSTN-based funding. The FCC has recently revised its Lifeline program so Lifeline money may be applied to broadband service, with certification of broadband Lifeline ETCs at the FCC.

Mr. Viorica told the committee that the FCC's goal of one megabyte per student by 2018 is economically infeasible. The PSFA has expended considerable resources in mapping out the current state of broadband in the schools and has researched the funding possibilities.

Mr. Gonzales discussed UNM's investments in collaborative efforts with other research institutions and the investment in the 505 GigaPoP. UNM's information technologies has established the Albuquerque GigaPoP, an aggregation point of networks to provide high-bandwidth network accessibility to the Sstate of New Mexico. ABQG is the on-ramp for high-speed national networks. These high-speed networks are the Western Regional Network and Internet2 (I2).

Mr. Badal emphasized planning for New Mexico and adopting a mixed technology that works across the state. He also suggested expanding the PRC fund to support broadband industry and suggested tax incentives for rural investment in infrastructure.

Ms. Martinez stated that CenturyLink has plans to invest $11 million annually for the next six years. Ms. Martinez also mentioned that the New Mexico Telecommunications Act was written in 1985 with updates in 1999 and 2006. She stated that it should be modernized to reflect the new technology and where business is today. The regulatory environment may affect business investment. Ms. Martinez also stressed the importance of public and private partnerships (P3) and pointed to a couple of P3 models — Utah Department of Transportation construction projects (open-trench situations) and the Colorado model for broadband funding that provides fewer barriers as well as tax deductions for investments.

Mr. Francis told the committee that, prior to 2011 there was no support for broadband to small telephone carriers anywhere in the U.S. He said the Connect America Fund is the only FCC-sponsored initiative to get more penetration into the market. In rural New Mexico, there will be haves and have nots. He asked the committee to take a lead in trying to encourage more deployment support for broadband.

Questions, discussion and comments from committee members included:

- erosion of the State Rural Universal Service Fund because of those who have moved away from land-line telephone service and are not paying their share of the infrastructure costs;
- the federal funding contingency on providing services to every area;
- the PRC broadband fund does not kick in until 2017 and is being challenged in the courts;
- the use of highway rights of way for broadband conduits;
- the PRC does not have regulatory authority over broadband;
- the levels of investments by the industry;
- problems with rights of ways across Indian land;
- in 2015, Senate Bill (SB) 159 provided $10 million per year for school infrastructure;
- the broadband divide is one of the largest issues before the legislature, which requires collaboration with the industry to create more opportunities;
- tax incentives that are tied to a level of service;
- the Nebraska broadband fund as a model to emulate;
- the amount of money going to networks within schools compared to money going to networks to schools;
- most schools in most areas have fiber optics;
- there is not enough business in New Mexico to warrant multinationals to invest in the state's infrastructure but the schools' conduit capacity exceeds demand;
- Nebraska schools do not need state money to lease lines from carriers;
- private industry piggybacking on the universities' system is similar to community aggregation;
- South Carolina's use of networks for research;
- qualification for proposed tax incentives would be dependent on minimum speed and quality of service;
- P-3 legislation (?); and
- the correlation between economic development and broadband coverage.

The industry group was requested to email Mr. Meeks with any suggestions on legislation. Also, members requested that Secretary Ackley look at new directions and potential funding for extending broadband.

The industry group was requested to have regular discussions with all of those involved in providing broadband services.

Approval of Minutes

The minutes of the first STTC meeting on May 26, 2016 were approved by unanimous voice vote.

DOIT Project Spreadsheet Update

Secretary Ackley presented the DOIT's quarterly spreadsheet that shows the status of the major IT projects. He discussed the project life-cycle activities — initiation, planning, implementation and closeout — and how the DOIT is managing projects through this life cycle. He mentioned that this process begins with an appropriation request for the Computer Systems Enhancement Fund.

Questions, comments and discussion from committee members included:

- the Children, Youth and Families Department's request for funding in 2017 for education for parents of Indian children with special needs ($10 million was requested, but the project was not funded);
- additional layers of complexity because of the difference in federal and state rules;
- the secretary of state's campaign finance system;
- risk assessment and security concerns;
- over which agencies does the DOIT have oversight and which ones do not fall under the DOIT;
- child support enforcement systems;
- tracking of milestones on the DOIT project report;
- the meaning of the percent column and whether it is an actual status or is based on the dollars expended;
- continuing concern that the total system cost is not identified during the initial budgeting phases; and
- laboratory information management system data availability to counties and special districts.

Tuesday, July 26

The meeting's second day reconvened at 9:01 a.m.

UNM Collaboration and Workforce Training with the New Mexico Federal Laboratories

Joseph L. Cecchi, dean, School of Engineering, UNM, discussed UNM's collaboration on research projects with New Mexico's national security laboratories. He said that UNM has strengthened its research programs and aligned many of them with areas critical to New Mexico's national security laboratories — Sandia National Laboratories, Los Alamos National Laboratory, the Air Force Research Lab and White Sands Missile Range. UNM has hired new faculty in key areas for the labs and has also been very successful in securing funding that has supported research, along with graduate students and post-doctoral fellows. UNM's proximity to the laboratories and UNM faculty and federal laboratory researchers working together have built

increasingly productive and vital research collaborations that have provided outstanding opportunities for training graduate students and post-doctoral fellows jointly with national laboratory scientists and engineers. This collaborative environment has helped both UNM and the national laboratories attract "the best and the brightest", he testified.

Questions, discussion and comments from committee members included:

- collaboration with the laboratories as it relates to teaching;
- the level of experience of New Mexico students and their preparation level;
- revamping the mathematics curriculum so that it is less theoretical and more context oriented;
- the percentage of Hispanic and other minority students;
- the advanced materials research facility collaboration with Sandia;
- security practices as a potential obstacle to collaboration;
- employment administration for joint appointments;
- examples of start-up enterprises that have resulted from collaboration, including nanospheres for cancer therapies;
- 3-D printing;
- articulation between K-12 and colleges;
- "bottom-up" as opposed to "top-down" collaboration; and
- the benefits of "show and tell" days.

Science, Technology, Engineering and Math (STEM) Education

Hector Ochoa, dean, College of Education, UNM; Jenn Gutierrez, elementary education program coordinator, UNM; Kathryn Watkins, associate professor, teacher education, educational leadership and policy, UNM; and viola florez, professor and PNM endowed chair, College of Education, UNM, discussed the Accelerated Alternative Licensure STEM Program initiative for teaching licensure in the STEM areas. The program recruits motivated STEM professionals and veterans into the middle and secondary education field. Of the 164 students in the program, 49 are in mathematics and 72 are in the science track.

The students take courses that are equivalent to a major in the science field. The goal is to develop a teacher who will train the next researcher by teaching in seventh through twelfth grades. This is a very intensive and extensive program, and fellowships are offered. There is a guarantee of placement within the Albuquerque Public School District upon successful graduation. The program teaches students how to deliver their knowledge with the complexities of teaching.

Questions, discussion and comments from committee members included:

- how elementary teachers teach in the STEM area without the background and training;
- the ability to measure the disposition of prospective teachers;
- grants to improve teacher self-efficacy with teaching labs and review;

- how to deal with cultural differences and disabilities;
- how to measure at various stages of the program;
- the teacher evaluation system does not address teacher efficacy;
- how a teacher's effectiveness is measured;
- the provision of in-service assistance;
- the framework for next-gen science;
- concern about the books being used for the next 10 years without next-gen;
- the role of the legislature;
- concern about the amount of professional development that current teachers get to adopt, new teaching methods and evolving technology;
- the "inquiry science" curriculum;
- "content expertise" and "instructional expertise";
- teacher "dispositions" ("bed side manner") and student motivation;
- intense "clinical practice" supervision;
- "embedded faculty";
- "self-efficacy";
- the importance of clinical practice;
- "student learning outcomes";
- math teaching methods;
- the teacher evaluation system not including "teacher efficacy";
- "cohort model schools";
- "next-gen science";
- "time on task";
- continuing education requirements and professional development;
- teaching younger students compared to teaching older students;
- math and science education standards for elementary (K-1 to K-3) schools;
- "directed education";
- masters degrees and licensing pathways;
- National Science Foundation (NSF) training for teachers;
- a Public Education Department conference;
- the problem of nationwide teacher shortages;
- integration of disciplines at UNM;
- aggressive recruitment at the College of Education; and
- In 2015, SB 329 sponsored by Senator Gay G. Kernan.

New Initiatives in K-12 Computer Science Education

Stephanie Forrest, distinguished professor of computer science, UNM, told the committee that President Obama announced in January 2016 an initiative to spend $4 billion through the NSF and the U.S. Department of Education to support "Computer Science (CS) for All". New Mexico was an early experimenter in this area with an NSF grant three years ago. This program was the first in the United States, and funding has been extended for one year through a supplemental funding award. She said that UNM has incorporated a CS course into its core curriculum and that she supports a requirement for CS training in secondary school curricula.

Questions, comments and discussion from committee members included:

- funding to sustain this program;
- how curriculum policy changes are needed at the Public Education Department;
- admissions requirements for universities beginning to include computer courses;
- encouragement of under-represented groups to participate in CS;
- the supercomputing challenge program;
- cybersecurity as a new field;
- preliminary requirements and preparation for a student to get to the point of studying CS;
- the Santa Fe Institute's Growing Up Thinking Scientifically program;
- a "career or work place" core curriculum instead of an acceptable component in math or science core curriculum; and
- CS as a laboratory science.

Roy Soto, former New Mexico chief information officer, asked for and received a commitment to be on the September agenda for the Las Cruces meeting.

Adjournment

There being no further business before the committee, the second meeting of the STTC for the 2016 interim adjourned at 12:17 p.m.