

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

September 23-24, 2019
University of New Mexico
Science & Technology Park Rotunda
801 University Boulevard SE
Albuquerque

The fourth meeting of the Science, Technology and Telecommunications Committee was called to order by Representative Debra M. Sariñana, chair, on September 23, 2019 at 10:06 a.m. at the University of New Mexico (UNM) Science & Technology Park Rotunda in Albuquerque.

Present

Rep. Debra M. Sariñana, Chair
Sen. Michael Padilla, Vice Chair
Rep. Christine Chandler (9/23)
Rep. Daymon Ely (9/23)
Rep. Kelly K. Fajardo
Rep. Jason C. Harper
Sen. Bill B. O'Neill
Rep. Melanie A. Stansbury
Rep. Linda M. Trujillo

Absent

Sen. William F. Burt
Sen. Mark Moores
Sen. William P. Soules

Advisory Members

Rep. Abbas Akhil
Sen. Craig W. Brandt
Sen. Jacob R. Candelaria (9/23)
Sen. Ron Griggs (9/24)
Sen. Richard C. Martinez (9/24)
Sen. Bill Tallman (9/24)

Sen. Mary Kay Papen
Sen. William H. Payne
Sen. Nancy Rodriguez
Rep. Joseph L. Sanchez
Sen. Peter Wirth

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

Staff

Mark Edwards, Legislative Council Service (LCS)
Ralph Vincent, LCS
Sara Wiedmaier, LCS

Guests

The guest list is in the meeting file.

Handouts

Handouts and other written testimony are in the meeting file and on the legislature's website at www.nmlegis.gov.

Monday, September 23

Welcome and Introductions

Representative Sariñana welcomed the committee and invited members and staff to introduce themselves.

UNM Welcome and Overview

Dr. Garnett S. Stokes, president, UNM, welcomed the committee and provided an overview of recent initiatives and accomplishments of UNM. She discussed efforts to close the achievement gap for minority students, noting that semester retention and graduation rates have improved across the board. Citing initiatives such as the "15 to Finish" program and reduced credit hour requirements for certain degrees, she said that for the first time in the university's history, over 50 percent of UNM students are graduating in five years. Dr. Stokes highlighted various research projects and grants at UNM and discussed progress made in the last few months to strengthen the university's relationship with Sandia National Laboratories and Los Alamos National Laboratory and increase research collaboration and internship opportunities.

Regarding legislative priorities for the upcoming session, Dr. Stokes discussed funding requests for renovations to the College of Fine Arts; a new facility for the College of Nursing and the College of Population Health programs; technology and laboratory improvements for the UNM Cancer Center Radiation Oncology Department; and an overall increase in money for the funding formula. She listed numerous research and public service projects that are ongoing at UNM, including programs to expand the network of educators in New Mexico.

Responding to questions from committee members, Dr. Stokes stated that:

- part of the legislative funding requests will be for compensation for faculty and staff across the university or, in some cases, based on merit;
- project funding requests have been limited to the highest priority projects;
- nursing undergraduate capacity will increase to 256 students once the new facility is built and the college is completely staffed;
- the nursing field has some salary inversion, especially within the university structure, because recruitment of new nurses is highly competitive;
- the university enrolls a large percentage of first-generation college students, and more funding should be allocated for programs that help first-generation students;
- the increase in graduation rates can be attributed to various programs, "invasive" advising with more one-on-one mentorship and implementation of research on student success and elimination of the achievement gap; and
- in order to better prioritize capital outlay funding for the university, there should be more collaboration among Albuquerque legislators.

Department of Information Technology (DoIT) — Project Dashboard Update and Plans

Vincent Martinez, secretary, DoIT, provided highlights of the projects that the DoIT reviews for state agencies. Secretary Martinez said that there were 99 information technology (IT) projects in fiscal year (FY) 2019 with an estimated total cost of over \$627 million, which is an increase from previous years. The estimated costs are derived from monthly reporting by agencies to the DoIT Enterprise Project Management Office. Secretary Martinez stated that of these 99 projects, 51 were closed in FY 2019 at a total cost of \$171,962,000.

Secretary Martinez highlighted the top 20 agencies by project appropriation amount and noted several larger projects from the current project portfolio, including the Human Services Department's (HSD's) Medicaid Management Information System Replacement project, the DoIT's statewide P25 Digital Public Safety Radio system and the Children, Youth and Families Department's (CYFD's) Comprehensive Child Welfare Information System modernization project. He stated that the DoIT has received all of its computer enhancement fund requests from agencies, which totaled over \$112 million for FY 2021, compared to over \$75 million in FY 2020. The hearings to review these requests with the agencies are scheduled to begin on October 21, he said, and added that the project details can be found on the DoIT website.

Responding to questions from committee members, Secretary Martinez stated that:

- the DoIT Office of Broadband and Geospatial Initiatives was created in 2016 as an expansion of the New Mexico Broadband Program and coordinates with state, local, federal, tribal and private entities;
- there are a number of revenue sources available for the further implementation of broadband services, which include funds appropriated by the legislature and funds from the United States Department of Agriculture's (USDA's) Rural Development Broadband ReConnect Program;
- in 2019, the legislature passed Senate Bill 280, which provided the following:
 - \$10 million for broadband expansion in rural areas statewide;
 - \$1 million to the Library Broadband Infrastructure Fund for library broadband expansion and improvement statewide;
 - over \$259,000 for rural broadband services in the north central New Mexico economic development district; and
 - \$50,000 for a Wi-Fi system for the New Mexico Rail Runner Express;
- the DoIT is collaborating with the UNM Earth Data Analysis Center to share data on service providers, fiber access points and funding amounts needed to expand broadband across the state and to create a data repository for geospatial data;
- the DoIT is awaiting final cost estimates and recommendations related to rural broadband funding from a statewide rural broadband assessment;
- the state and federal governments can set service level requirements for broadband expansion when providing grants and loans to telecommunications companies;
- creation of a north-south broadband corridor and an east-west corridor is important for the build-out of broadband services; and
- the DoIT has hired 26 full-time employees since January and plans to hire 45 more by the end of the year, as laid out in its new staff restructuring plan.

FY 2019 Fourth Quarter IT Project Status Report and FY 2021 IT Funding Requests

Brenda Fresquez, program evaluator, Legislative Finance Committee (LFC), provided the LFC's fourth quarter IT status report, which details the LFC's oversight of state government projects. Ms. Fresquez discussed 14 projects that have a total estimated cost of \$305 million, including the DoIT statewide infrastructure replacement and enhancement project; the HSD's Medicaid Management Information System Replacement project; and the CYFD's Comprehensive Child Welfare Information System project.

Ms. Fresquez noted that the LFC report is based on staff evaluations, while the DoIT report is based on agency self-reporting, resulting in discrepancies in the progress status assigned to the individual projects. She discussed concerns regarding several of the current projects under review, such as missed deadlines, a lack of detailed project plans or project managers, poor project organization structure and insufficient funds.

Regarding FY 2021 computer system enhancement requests, Ms. Fresquez stated that 22 agencies have requested \$181 million for 37 projects. These requests include Taxation and Revenue Department (TRD) projects that total \$19.7 million; \$15 million for the State Personnel Office human capital management system enhancements; \$24 million for the CYFD to continue to modernize its systems; and \$17.9 million for Department of Health projects.

Responding to questions from committee members, Ms. Fresquez stated that:

- each individual agency is responsible for managing its own IT projects, but the DoIT certifies projects and provides high-level oversight;
- ongoing projects across all state agencies are estimated to cost around \$1 billion;
- project funds are typically appropriated in phases to ensure compliance and to account for additional or unforeseen costs in later phases of projects;
- the LFC ensures that agencies use best practices and have done due diligence prior to appropriation of funds to reduce additional future costs;
- the TRD request includes four projects, including the combined reporting system changes required by statutory amendments for corporate income tax calculations; and
- to help agencies stay on schedule with their projects, the LFC can direct agencies to resources and the DoIT can grant extensions.

Microgrid

Dr. Ali Bidram, assistant professor, Electrical and Computer Engineering Department, UNM, discussed the Power and Energy group, a multidisciplinary research program that includes grid modernization and protection, renewable energy systems and microgrid and smart grid design and operation. Dr. Bidram discussed the history and components of the UNM Center for Emerging Energy Technologies' Mesa del Sol microgrid and noted some of the major benefits, such as local workforce training and research in the areas of renewable energy and microgrid operation, economic development opportunities and the rare capability of testing large electric power systems in a university setting. He went on to discuss the university's collaboration with other New Mexico universities and institutions, national laboratories, nonprofits and industry partners on the New Mexico SMART Grid Center, which received \$24 million in funding from

the National Science Foundation's (NSF's) New Mexico Established Program to Stimulate Competitive Research (NM EPSCoR) to develop a modern electric grid that is sustainable, modular, adaptive, resilient and transactive. He discussed other ongoing research at UNM regarding microgrids, such as distributed control, cybersecurity and adaptive protection systems.

Responding to questions from committee members, Dr. Bidram stated that:

- NM EPSCoR is funded by a federal match to state funding;
- the fuel cell at the Mesa del Sol microgrid is powered by hydrogen technology;
- the Mesa del Sol microgrid ties into Albuquerque's power grid and provides usable energy as well as research opportunities; and
- microgrids can support local load requirements and can supplement the power grid so that outages are limited in the event of a natural disaster or attack.

Computer Science Education in New Mexico: Current Trends, Areas of Need and Opportunities to Invest in Computer Science Education in New Mexico's K-12 Schools

Paige Prescott, executive director, Computer Science Alliance, and Dr. Gwen Perea Warniment, deputy secretary of teaching, learning and assessment, Public Education Department (PED), provided a background of computer science and IT and discussed local and national trends and educational initiatives. Ms. Prescott described issues and shortfalls in the computer science industry in New Mexico, noting that there are not enough computer science graduates to fill available positions. She also noted the lack of diversity among students who are pursuing computer science degrees, as well as the lack of access to computer science or IT classes in high schools across the state.

Ms. Prescott discussed various initiatives to improve this landscape, such as teacher professional development, earlier introduction of students to computer science and multiple policy changes to increase funding for programs and create a computer science task force. She cited states that are leaders in computer science policy and mentioned that 19 states require all high schools to offer computer science classes. She discussed innovative approaches to increasing computer science education in the state and allowing school districts to create their own plans. She said that in order to grow this field, the legislature will need to fund initiatives and implement policy to support computer science ecosystems across New Mexico.

Dr. Perea Warniment discussed the increased enrollment of high school students in computer science and IT courses and compared New Mexico data to national data. She outlined recommendations to equitably implement policies that will improve the computer science landscape in the state. She highlighted the states that are meeting the nine policy recommendations created by a collaboration between the Computer Science Teachers Association and Code.org to make computer science fundamental for students. She pointed out that of these nine policies, New Mexico has implemented K-12 computer science standards and state-level funding for professional development and allows computer science to satisfy a core high school graduation requirement.

Responding to questions from the committee, Ms. Prescott and Dr. Perea Warniment stated that:

- regarding outreach in rural areas and involving younger students in computer science, the PED would like to do more and is introducing programs such as a computer education week and a "day of code" during the legislative session;
- the New Mexico Technology Council, the New Mexico Association for Commerce and Industry, Los Alamos National Laboratory and various local businesses have been instrumental in engaging communities in computer science initiatives;
- computer science certificate holders can earn a salary of up to \$45,000 per year, and a graduate with a two-year degree can earn up to \$80,000;
- in order to fill the many computer science vacancies at Holloman Air Force Base and Sandia National Laboratories, the state should develop a science, technology, engineering and mathematics (STEM) pipeline;
- the proposed computer science task force will help to create a vision and a statewide plan;
- the state should prioritize creating a computer science teacher certification program and requiring all high schools to offer computer science classes;
- the estimated cost to require all high schools to offer computer science classes would be between \$400,000 and \$800,000; and
- the state funding that has already been allocated will support teacher certification.

Center for Innovative and Strategic Transformation of Alkane Resources (CISTAR)

Dr. Fernando Garzon, professor, Department of Chemical and Biological Engineering, and director, Center for Micro-Engineered Materials (CMEM), UNM, described his work as "bottom-up" research with a focus on energy conversion and storage, and he provided the committee with an overview of the CMEM. The mission of the CMEM is to serve as a focal point for interdisciplinary micro-engineered materials research, development, education and commercialization in collaboration with other New Mexico universities and the national laboratories. He discussed the instrumentation, analytical facilities and various grants that make the CMEM nationally competitive and enable it to provide graduate and undergraduate training opportunities and generate revenue for the state. He highlighted the numerous awards, patents, publications and fellowships of faculty at the CMEM.

Dr. Garzon then discussed the CISTAR, an NSF Engineering Research Center that is focused on energy infrastructure and the conversion of hydrocarbons from shale resources to chemicals and fuels in a transformative system of modular, local processing plants. The CISTAR is a national, multi-university initiative that integrates academic and industrial experience to supply petroleum and chemical needs, reduce greenhouse gas emissions and bridge the gap to renewable resources and is funded by a 10-year NSF Engineering Research Center grant. He provided a breakdown of the faculty and role of each university and industry partner and discussed process development, technology readiness and the chemistry and value chain behind the research. He emphasized the economic opportunity for New Mexico and the nation to convert light hydrocarbons into additional fuel and chemicals, especially since the United States has become a net exporter of natural gas in the last decade.

Responding to questions from committee members, Dr. Garzon stated that:

- the CISTAR is seeking to develop the process behind natural gas operations and will investigate the most economical extraction methods;
- the regulatory environment is not getting in the way of this economic transformation, and the state has been a good partner; and
- the transformation to an electric and hydrogen fuels economy will be a slow process that will require more efficient ways to produce biofuels.

Innovation Academy

Rob DelCampo, Ph.D., professor, Anderson School of Management, and executive director, Innovation Academy, UNM, and Kyle Guin, student entrepreneur, Innovation Academy, UNM, discussed the Innovation Academy program, UNM's incubator for ideas, businesses and people. Dr. DelCampo shared that the program was founded three years ago and is funded by grants and gifts rather than by state funds. He said that the Innovation Academy is open to students in any major because the goal is to infuse creativity and entrepreneurship into students' degree studies through a variety of programs designed to develop transferable skills that students and graduates can use in both academic and professional settings.

Dr. DelCampo highlighted the diverse student base of the academy, which has over 1,000 students, with over 50 percent female students and students of color and over 65 percent first-generation college students. He noted that there are 54 student-founded companies currently in operation and generating revenue, most of which were launched while the students were still in school. He discussed competitions, programs and partnerships available to students through the academy. He noted that UNM takes no ownership of student work and that over \$1 million has been awarded to students by outside investors. He discussed the classes that are currently available at the academy and plans for additional courses in the future.

Sharing his personal experience, Mr. Guin said that he had initially struggled to find his place in college and felt torn between pursuing academia or entrepreneurship until he discovered the Innovation Academy. He emphasized the strong support team of faculty and peers and the access to resources and funding that allowed him to create, market and sell his phone application company when he was a sophomore and to also develop another company that has generated over \$250,000 in revenue and is currently hiring student employees.

Responding to questions from committee members, Dr. DelCampo stated that:

- the Innovation Academy is funded through donations, grants and gifts but is working on becoming institutionalized by UNM;
- the academy does not receive instruction and general support from the UNM funding formula but does receive some in-kind funding, such as classroom space;
- a graduate assistant handles all early-interest outreach and has contacted every public high school from Belen to Santa Fe, six of which are interested in developing courses or groups, along with the Public Academy for Performing Arts charter school;

- to retain or attract companies and young professionals, the City of Albuquerque needs to focus on consumer-specific economic development, marketing and other incentives for new, small to mid-sized companies that do not use Local Economic Development Act (LEDA) funds or tax credits; and
- New Mexico should emphasize and market the quality of technology and innovation at the Innovation Academy and elsewhere in the state to attract businesses to locate here.

Recess

The meeting recessed at 4:04 p.m.

Tuesday, September 24

Reconvene

Representative Sariñana reconvened the meeting at 9:14 a.m at the UNM Science & Technology Park Rotunda.

New Mexico Bioscience Authority (NMBSA) Status Update and Bioscience Center of Excellence

Dr. Richard S. Larson, executive vice chancellor, UNM Health Sciences Center, and president and chair, NMBSA, provided the committee with a brief history and update on the mission, achievements and current goals of the NMBSA, which was established by the legislature two years ago as a public-private partnership intended to capitalize on New Mexico's strengths in the bioscience field and grow the industry in the state to drive economic development and job creation. He noted that during the 2019 legislative session, Governor Michelle Lujan Grisham signed House Bill 7, which established the NMBSA as one of four centers of excellence at New Mexico higher education institutions.

Dr. Larson highlighted some of the reasons to target the bioscience industry, including the instability of the oil and gas industry; the high salaries, growth and stability of bioscience careers; and economic opportunity for the state. He discussed the roles of public and private partners in bringing new technology and inventions to market and outlined the duties of the NMBSA. He noted that since 2004, 62 private companies have been founded from research at UNM and the UNM Health Sciences Center but that nearly one-half of these companies have left the state. He cited IntelliCyt Corporation as a success story of the technology transfer process and a company that was sold for millions but still operates in the state.

Addressing requests to the legislature, Dr. Larson said that the NMBSA would benefit from a \$25 million appropriation for a direct investment fund to incentivize private matched funds and a \$100 million appropriation for a New Mexico bioscience endowment fund.

Responding to questions from committee members, Dr. Larson stated that:

- the NMBSA is currently rolling out the Community Readiness program, which is intended to evaluate municipalities across the state for their ability and preparedness to create "innovation zones";
- start-ups are funded through the LEDA for infrastructure needs and the Job Training Incentive Program for job training, but the NMBSA wants to create a direct investment fund to support start-ups with venture capital and would hire a fund manager to oversee disbursements; and
- the bioscience field needs graduates from a variety of degree programs beyond STEM, including humanities, marketing and management information sciences.

There was a recommendation by a committee member that Dr. Larson present this information to the LFC.

United States Department of Agriculture (USDA) Rural Development

Dr. Arthur A. Garcia, state director of New Mexico, USDA Rural Development; Dr. Brian Smith, Arizona/New Mexico general field representative, USDA Rural Development; and Ray Melton, program director, Business and Cooperatives, USDA Rural Development, discussed various rural development programs offered through the USDA. Dr. Garcia began by stating that many of these programs help to accelerate science and research across the state by funding projects that expand infrastructure, technical assistance and other resources to rural communities. Mr. Melton said that there are 28 programs available to rural communities that provide grants or loans for housing and community facilities, businesses and cooperatives and utilities.

Mr. Smith provided an overview of some of the programs that are available for broadband build-out in rural areas. He discussed the USDA Distance Learning and Telemedicine Grant Program, which provides funding for equipment to address the shortage of doctors and teachers in remote areas; the USDA Rural Utilities Service Community Connect Grant Program, which provides funding for communities to provide the minimum bandwidth to all residents and business customers; and the ReConnect Program, which provides funding for communities to construct, improve or acquire broadband facilities and equipment. He discussed the scoring process, available application assistance, eligibility criteria and requirements for program applicants and proposed projects. He also provided a list of available resources for program applicants.

Responding to questions from committee members, Dr. Garcia, Mr. Melton and Dr. Smith stated that:

- the scope of telemedicine depends on the particular issue and will be dealt with on a case-by-case basis, but mental health issues, heart monitoring and other electronic systems are good applications of telemedicine;
- the USDA Rural Development programs do a great deal of work to develop water and wastewater infrastructure on tribal lands, but the Navajo Nation poses a huge challenge because of its land size and isolation;
- drone delivery of medicines or computerized pharmacies could be a future component of telemedicine;

- the ReConnect Program has received applications from the Continental Divide Electric Cooperative, Plateau Telecommunications and the Pueblo of Acoma;
- the ReConnect Program has provided funding for fiber build-out in Roosevelt County, the Mescalero Apache Reservation and the Navajo Nation;
- requests for construction of electric vehicle charging stations could be submitted under the USDA's Community Facilities Direct Loan and Grant Program, the Business and Industry Guaranteed Loan Program or the Rural Energy for America Program, if a renewable energy source is being used;
- the USDA will be hosting events and information sessions to educate communities across New Mexico about the ReConnect Program; and
- the DoIT can request funding from USDA Rural Development programs on behalf of rural communities.

Cannabidiol (CBD) Oil: A Value-Added Product for Hemp Production in New Mexico

Vincent Cordova, founder, New Mexico Hemp Services, discussed the new hemp industry in the state and the potential to expand to CBD oil production. Mr. Cordova said that the legalization of hemp production will provide job growth and economic development in rural communities. He explained the differences between marijuana and hemp, outlined the hemp production and permitting processes and emphasized the high return on investment of hemp production. Mr. Cordova described New Mexico Hemp Services as a full-service company for New Mexico hemp farmers, from the sale of hemp plant clones to consulting, extraction and manufacturing. He said that the state should develop a long-term, integrated hemp strategy because New Mexico will soon be competing with every other state in the country, and to be competitive, the industry will require the best plant genetics, support from New Mexico State University's agricultural program, appropriate infrastructure and the highest product quality.

Responding to questions from committee members, Mr. Cordova stated that:

- New Mexico Hemp Services is a one-stop shop for farmers, providing clones, seeds and assistance in planting as well as purchasing the final product from the farmer to dry and process;
- farmers have to destroy a field if the plants exceed 0.3 percent tetrahydrocannabinol (commonly known as "THC") content, but this has not happened very often;
- farmers can produce more hemp if the plants are grown indoors;
- once hemp is harvested for manufactured products, the United States Food and Drug Administration is responsible for oversight, rules and regulations;
- state regulations are hurting local suppliers because there are fewer regulations on the imported products coming into the state than those that are locally produced;
- although the return on investment is around 400 percent, many investors still find hemp production too risky due to misinformation and bank regulatory issues;
- there is no minimum acreage for hemp farms to be economically feasible;
- the overall national market value is around \$4 billion and is expected to be \$20 billion by 2022; and

- the legislature could help the hemp industry thrive in New Mexico by changing the regulatory environment to favor locally produced hemp and allocating funds to help build cloning, drying, processing and manufacturing facilities.

Adjournment

There being no further business before the committee, the meeting adjourned at 12:15 p.m.