

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

**September 24-25, 2018
Andres Z. Silva Conference Center
Deming**

The fourth meeting of the Science, Technology and Telecommunications Committee (STTC) was called to order by Senator Michael Padilla, chair, on September 24, 2018 at 9:05 a.m. at the Andres Z. Silva Conference Center in Deming.

Present

Sen. Michael Padilla, Chair (9/24)
Rep. Candie G. Sweetser, Vice Chair
Sen. William F. Burt (9/25)
Rep. Kelly K. Fajardo
Sen. Mark Moores

Absent

Rep. Daymon Ely
Rep. Jason C. Harper
Sen. Bill B. O'Neill
Rep. Debra M. Sariñana
Rep. Gregg Schmedes
Sen. William P. Soules
Rep. Linda M. Trujillo
Rep. Monica Youngblood

Advisory Members

Sen. Craig W. Brandt
Rep. Bill McCamley (9/24)
Sen. Mary Kay Papen
Rep. Debbie A. Rodella
Sen. Nancy Rodriguez (9/24)
Sen. Bill Tallman

Sen. Jacob R. Candelaria
Sen. Carlos R. Cisneros
Rep. Stephanie Garcia Richard
Sen. Ron Griggs
Sen. Richard C. Martinez
Sen. William H. Payne
Rep. Nick L. Salazar
Rep. Carl Trujillo
Sen. Peter Wirth

(Attendance dates are noted for members who did not attend 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.

Monday, September 24

Call to Order and Introductions

Senator Padilla welcomed the committee and invited members and staff to introduce themselves. Senator Padilla named Representative Sweetser as chair for the remainder of the committee meeting. Senator Papen designated Senators Brandt, Rodriguez and Tallman as voting members for the meeting.

Welcome and Activities in the City of Deming

Benny L. Jasso, mayor, City of Deming, and Aaron Sera, city administrator, City of Deming, welcomed the committee to Deming and discussed several programs. Mr. Jasso introduced Christie Ann Harvey, who is president of the Deming MainStreet Project. Mr. Jasso and Mr. Sera outlined the progress that Deming has made in several areas — broadband infrastructure, a books-online project, a business incubator facility and a workforce development program. They mentioned that the city will be requesting funding to help build a business incubator facility to help start-up businesses. They also discussed the success of the workforce development program and stated that the city hired two graduates of the program for full-time positions.

In response to questions regarding economic development activities, Mr. Sera discussed the broadband services provider, WNM Communications. Mr. Sera said that its services are primarily used by city departments and the library but that they could expand. WNM Communications is building out the infrastructure, and city personnel negotiated the franchise and rights of way in return for the company providing public wireless access in the six city parks. Mr. Sera also mentioned that in addition to being primarily an agricultural community, Deming is currently involved in discussions for a salsa factory, which would provide 90 local jobs, and a company that manufactures wiring harnesses for mobile homes.

Broadband for Libraries: Implementing the Library Broadband Infrastructure

Teresa Ortiz, library media specialist, Deming High School, introduced Ben Ortiz and Joseph Sabatini of the New Mexico Library Association Legislative Committee. Ms. Ortiz discussed the Library Broadband Infrastructure Fund that was created by House Bill 207 during the 2018 legislative session. While legislation created the fund, there was no allocation of money to the fund, and now \$500,000 in funding is needed. This funding will be administered by the Department of Information Technology (DoIT) and will bring broadband infrastructure to public, tribal and school libraries.

The funding will be leveraged by the E-rate program. This is the commonly used name for the Schools and Libraries Program of the Universal Service Program, which is administered by the Universal Service Administrative Company under the direction of the Federal Communications Commission to bring broadband infrastructure to schools and libraries. Because of the complexities involved in applying for E-rate funding, only 20 percent of libraries

applied in 2017. The Library Broadband Infrastructure Fund could be used to support the grant application process, thereby leveraging state funds with a 90 percent federal match. Columbus Elementary School is an example of how this funding can benefit libraries. The school had connectivity through a G3 line that provided a bandwidth of 45 megabytes per second (Mbps) for the 32 miles from Columbus to Deming. With the E-rate funding, the school now has a bandwidth of 500 Mbps at a total cost of \$700,000. Because of the 90 percent match from the E-rate program, plus another state match, the district only spent \$34,000 to get this additional bandwidth.

Mr. Sabatini provided a paper written by Kay Mathiesen titled "The Human Right to Internet Access: A Philosophical Defense", and he discussed the importance of providing library service to every single New Mexican, noting that the rural areas need access to broadband services similar to those in urban areas. He noted that rural populations need to be able to compete with national and international populations, and without access to broadband services, this is not possible.

The members asked about agreements among entities to pool resources so that more access to broadband services can be enabled for everyone. The rural electric cooperatives model was explored as a possible pathway to providing better broadband services in rural areas. The problems in a rural area such as Deming include the lack of the necessary personnel and knowledge to work on these types of technical issues.

The members also questioned the future of this technology and the high cost of installing fiber-optic cables through rural areas. The members suggested that rural communities might be looking at yesterday's technology and not looking forward enough to future technologies.

Members considered the request for \$500,000 in funding and questioned how much impact this would make in rural areas. Members also questioned whether this money would be recurring and, if not, what the cost of maintaining the infrastructure would be. Because the E-rate funding averages \$34 million annually, the state would need a 10 percent match to grow this E-rate amount. Library general obligation bonds can also be used to provide additional funds for libraries. At the current time, the DoIT administers the application process for E-rate funds.

Approval of Minutes

Upon separate motions and without objection, the minutes for the June, July and August meetings were approved.

Freeport-McMoRan New Mexico Operations

Anthony "T.J." Trujillo, lobbyist, Freeport-McMoRan, introduced Erich Bower, president and general manager, Tyrone Mining, LLC, Chad Fretz, president and general manager, Chino Mines Company, and Tony Trujillo, lobbyist, Freeport-McMoRan. Mr. Fretz discussed the Chino, Cobre and Tyrone mines, which have a long history of copper mining in the Grant County area and currently have 1,412 employees and an average of 200 contractors daily. The Chino mine produced 215 million pounds of copper in 2017, while the Tyrone mine produced 61 million pounds of copper.

The mining operations include drilling, blasting, loading and hauling. Freeport-McMoRan owns five electric shovels for loading into 44 haul trucks. The cost of an electric shovel is approximately \$35 million, and the cost of a haul truck is between \$5 million and \$6 million. Mined material is transported to a crusher for concentrating or to a leach stockpile.

The annual overall economic impact for this copper mining operation is estimated at \$155 million for Grant County and \$375 million for the state. In addition, Freeport-McMoRan donates over \$1 million to Grant County charities, schools and nonprofits. About 2,400 acres of tailings have been reclaimed in the Tyrone area, and another 2,000 acres have been reclaimed in the Chino area. The reclamation process requires about four years.

Committee members asked about Freeport-McMoRan's support for workforce education and were told that employees can be approved for up to \$5,000 per year to pursue a degree at a higher education institution. Also, there are extensive opportunities for career development through on-the-job training. The company also encourages apprenticeships and advertises through job fairs and social media. Many skilled trades have a shortage of qualified workers, so recruitment is widespread. Members asked about an emphasis on jobs for veterans and the potential of recruiting more veterans.

In response to a question regarding the productivity of the mines, the panelists stated that at a price of \$2.00 per pound of copper, the Cobre mine would be productive at least until 2029. If the price exceeds \$2.50 per pound, that would add another 10 to 15 years to the productive life of the mine and as much as 45 years if the price were higher. The Tyrone mine only has about four years left at \$2.00 per pound, but if the price were \$3.50 per pound, it could be open an additional 20 years. It was noted that the price tends to fluctuate on a four-year to six-year cycle.

The presenters pointed out that electric cars use about four times as much copper as other vehicles. They also mentioned that while plastic has replaced copper for most pipes, pipes were only a small percentage of the overall copper market. Because of the conductive qualities of copper, it is used extensively in the solar power industry.

Committee members noted the company's reclamation efforts and asked about the strategies for using native materials and creating natural rain runoff paths. While reclaimed land is not useful for farming, it can be used for grazing cattle.

Spaceport Status Update

Dan Hicks, chief executive officer, Spaceport America (SA), began the presentation by discussing the status of the commercial space industry as an economic driver worldwide and how SA will help propel the United States as a leader in space exploration. SA is a developing economic hub with unique capabilities for the commercial, civil and national security space sectors. Since its first test launch in 2006, SA has successfully completed 200 safe and secure vertical rocket launches.

The commercial space market is booming, with \$339 billion invested in 2016, \$383.5 billion so far in 2018 and \$2.7 trillion predicted to be invested annually by 2045. Despite

growing competition in the industry, SA has a strategic advantage with 6,000 square miles of restricted airspace in collaboration with the U.S. Army White Sands Missile Range, providing 24/7 access to space. Additionally, the location of the facility provides 340-plus days of sunshine, low population density, less salt corrosion damage, 24/7 security and privacy.

Current projects are focused on suborbital research, astronaut experience and university outreach and competitions, but Mr. Hicks stated that SA's ultimate goal is to grow into a full-service space transportation hub. Mr. Hicks also noted some of the federal, state and local partners and regulatory agencies that affect SA. Capital projects for fiscal years 2020 through 2024 are expected to total \$75 million and will include vertical launch area improvements, construction of a spaceway taxiway, expanding the welcome center, building additional ground support hangars and infrastructure to enable rocket motor manufacturing at SA.

Jonathan Firth, executive vice president, Virgin Galactic (VG), updated the committee on VG's space portfolio and its partnership with SA. VG is the anchor tenant at the spaceport and has signed a 20-year contract with the state for a terminal and hangar facility. VG has 45 employees based in Las Cruces, more than half of whom are from New Mexico, and has plans to relocate an additional 85 employees from its California site and make additional local hires. Since 2013, VG has paid New Mexico more than \$11 million in rent and associated fees. In-state spending by the company totals over \$22.5 million.

The current focus of VG is suborbital space flight for scientific research and personal space flight. More than 600 people from all over the world have already reserved a seat. In partnership with SA, the National Aeronautics and Space Administration, New Mexico State University (NMSU), Las Cruces Public Schools and other entities, VG hosted close to 3,000 attendees for the first annual Las Cruces Space Festival earlier this year. Mr. Firth concluded with a brief overview of upcoming projects for 2019.

Responding to questions from committee members, Mr. Hicks outlined the capital outlay requests for SA by year, as well as plans to bring in more developers through public, private and federal partnerships. Mr. Hicks said that both Virginia and Florida are attempting similar activities at their spaceports and are receiving more legislative funding, which could give them a competitive advantage over SA in the future. Regarding private investment at the site, VG was noted for having invested over \$1 million in infrastructure at SA.

Education for Careers in Aquaponic Farming

Stephen Gomez, Ph.D., chair, School of Trades, Advanced Technologies and Sustainability, Santa Fe Community College (SFCC), began by addressing some background and current statistics at SFCC. SFCC offers certificates and associate's degrees and serves roughly 15,000 students per year, the majority of whom attend part time. Dr. Gomez highlighted some of the sustainability initiatives at the SFCC Trades and Advanced Technology Center, such as LED motion-sensing lights, wastewater recycling for irrigation and renewable, site-generated energy. SFCC has earned many awards for excellence, including its algae cultivation facility and algae laboratory in the 2017 readers' poll in *Algae Industry Magazine*.

To expand access to baccalaureate and graduate courses to community college students in the area, SFCC has partnered with the University of New Mexico, New Mexico Highlands University and Northern New Mexico College, to create the Santa Fe Higher Education Center. Dr. Gomez listed some of the industry and government partnerships that have made SFCC the award-winning institution it is today.

Emphasizing the need for careers in aquaponic farming, and therefore the need for education pathways for these careers, Dr. Gomez cited the decline in farmland in the past few decades coupled with expedited population growth. The proposed solution to this worldwide problem is to produce more food per acre, despite the fact that U.S. farms are producing at their most efficient level in history. Controlled-environment agriculture (CEA) is a technology-based approach to food production that maintains optimal growing conditions of crops within enclosed greenhouses and is one method to increase the yield per acre. CEA technologies include hydroponics, aeroponics, aquaculture and aquaponics.

SFCC is expanding its agriculture education program to include more hands-on training in cultivating, processing and distributing food in urban environments through courses in hydroponics, aquaponics, on-site energy production, microgrid controls and building automation systems. SFCC is currently working on a campus-wide microgrid energy system that will cluster all energy assets to better manage power distribution and grid reliability throughout the campus. The current and planned energy assets at SFCC include biomass boilers; solar panels; solar, thermal and wind energy; and battery storage. For biomass energy production, SFCC is looking at various food waste collection methods and currently collects about 500 pounds per week of biomass from Dunkin' Donuts discards. The panelists outlined two major goals for the campus: 1) become food independent by 2022; and 2) become energy independent by 2025.

Luke Spangenburg, director, Biofuels Center of Excellence, SFCC, discussed algal-specific research and opportunities at SFCC. The Algae Technology Educational Consortium (ATEC) was founded by the U.S. Department of Energy's (DOE) Bioenergy Technologies Office to develop associate's degrees in algae cultivation and algal biotechnology. The ATEC allocated \$4.5 million over six years to the SFCC Biofuels Center of Excellence, which is now offering four new courses relating to algal physiology and ecology, biomass monitoring and economic analysis.

Mr. Spangenburg highlighted a few success stories of past students in the program. He also noted some areas that could be improved upon, such as more community input and outreach and projects and education in native and modern farming methods. Specific needs moving forward include hiring a physical plant microgrid and building systems technician at an annual salary of \$60,000, hiring a sustainable operations facility technician at an annual salary of \$60,000 and upgrades to the CEA program for automating various systems at a cost of \$250,000.

Nicholas Petrovic, owner, Apogee Spirulina LLC, shared with the committee his own experience in the SFCC algae cultivation program and the difficulties he faced in starting his business in Santa Fe County. The county denied every location proposal for his algae farm that he submitted over a two-year period. The University of Nevada Reno Innevation Center

supported his project immediately, which almost caused him to leave New Mexico. Randy Grissom, president, SFCC, instead offered space on the SFCC campus for the construction of the microfarm. Mr. Petrovic stated that the stifling atmosphere he experienced in New Mexico is hurting innovation, entrepreneurship and economic growth in New Mexico.

In response to a question about the cost-benefit analysis of solar panels on campus, Dr. Gomez stated that the college expects to pay off the initial costs in four to five years and then will be producing free electricity. Energy demand will be completely supplied by solar power during daylight hours and will be supplemented by biomass and natural gas generation otherwise. Through DOE grants, the SFCC eventually plans to run the college entirely with battery-stored energy, but he acknowledged that there are still many issues with lithium battery technology.

Regarding Apogee Spirulina LLC, Mr. Petrovic said that his farm produces spirulina, a fresh-water algae that consists of 65 percent protein, compared to soy at 33 percent and meat at 25 percent.

In response to a question, the panelists verified that their \$250,000 capital outlay request would be a one-time request, whereas the two salaried positions, costing \$120,000 per year, would likely be recurring for three to four years or until the campus could generate the funds through energy production and agriculture.

The committee recessed at 3:05 p.m. for a tour of an algae cultivation farm in Columbus, New Mexico, led by Rebecca L. White, Ph.D., vice president of operations, Qualitas Health, Inc.

Tuesday, September 25

Reconvene

Representative Sweetser reconvened the committee at 9:15 a.m.

Controlled Unclassified Information (CUI) in the Cloud

Christopher Ratheal, systems developer specialist, Physical Science Laboratory (PSL), NMSU and Abel Sanchez, director of computer support, Office of the Vice President for Research, NMSU, discussed the work being done in the PSL regarding CUI. The PSL is an aerospace and defense-oriented research and development organization headquartered at NMSU that employs a variety of experts in engineering, software, technology and science. As a government contractor for the U.S. Department of Defense, the PSL is required to follow specific requirements to secure its work and safeguard all data, Mr. Ratheal explained. CUI covers various fields such as critical infrastructure, intelligence, law enforcement and student and health records.

To meet CUI compliance requirements, the PSL employs 110 controls, based on the "National Institute of Standards and Technology Special Publication 800-171", that break into three types: 1) administrative; 2) technical; and 3) physical. Administrative controls may include company policy, training requirements and password protections. Technical controls

may include expiration dates on files, encryption of data and monitoring programs. Physical controls include the more expected forms of defense such as gates, guns and guards.

Mr. Ratheal noted that when it comes to securing information technology (IT), limited resources and high costs pose major obstacles. To lessen this cost, the PSL has created a platform that can be used by any website or application to secure its activity automatically. This platform will use various tools for configuration management, software versioning and password management to build a repeatable, reliable and secure system for all CUI. Some benefits to the program include consistent behavior, cost reduction, scalability, self-healing capabilities and disaster recovery. The PSL is currently working on how to restructure its program to work with cloud computing.

Committee members asked about the scalability and capacity of the program and were told that services and program interfaces can be added and removed as needed and can be backed up virtually at any time. Access to a cloud vendor, such as Amazon Drive, is based on market value at a given time and can be purchased on an hourly, daily or monthly basis. Some aspects of this program already exist, but now all tools are contained within one platform.

Mr. Ratheal stated that there needs to be a more efficient pathway for universities to request funding for IT projects. Mr. Ratheal added that the PSL has a wide range of customers and, therefore, a wide range of data and security requirements and can choose to use an in-house cloud platform or a cloud service provider. Many applications at NMSU, such as email and the learning management system, already use a cloud platform. There was a request from a committee member for an update on the DoIT's statewide policy on cloud computing.

NMSU's Sunspot Consortium Update

James McAteer, Ph.D., assistant professor, NMSU, presented on the lesser known of New Mexico's national laboratories, the Sunspot Solar Observatory (Sunspot). Sunspot has gained a lot of attention in the past month due to a mysterious, sudden evacuation and closure of the site, which was reportedly due to illegal conduct by one of the site's custodians. Dr. McAteer stated that the Sunspot will not allow the actions of one individual to ruin a New Mexico success story or deter the vital research being conducted at the site.

Sunspot is jointly managed by NMSU and the Association of Universities for Research in Astronomy (AURA), with NMSU in charge of research and public outreach and AURA in charge of maintaining the grounds, buildings and safety. These two entities split the annual \$1.2 million budget for Sunspot. Dr. McAteer outlined some of the funding sources, including state research and public service projects (RPSP) funding of \$273,400 that Sunspot hopes will become a recurring fund. This investment by the state led to the confidence and support from AURA, which then agreed to come on as a site operator.

The four-fold mission of Sunspot is to promote science, education, outreach and economy, all of which are highly interconnected. Science is the foundation that creates the opportunity for public outreach and education for students of all levels, from kindergarten through graduate school. Education and outreach improve the economic impact of Sunspot on

the state. The site currently has nine full-time employees. It is looking to hire more part-time employees and to offer summer programs for graduate students. Sunspot has set a goal of bringing in 12,000 visitors to the site per year, with the intent of reinvesting every dollar spent at the visitor's center into K-12 education. Dr. McAteer emphasized the wide range of support for Sunspot and its research in space weather and solar physics, from local residents and national institutions. He noted a \$375,000 National Science Foundation grant for a graduate student to conduct Doppler research.

Committee members asked about the role of NMSU at Sunspot and the planned use of the \$273,400 RPSP funding. They were told that NMSU will provide students to conduct research and run the visitor's center, and the funding will go toward creating more jobs and paid internships for students as well as for conducting research. Responding to a comment about the handling of the recent national scandal involving Sunspot, Dr. McAteer explained that once the court documents became public record, Sunspot was able to discuss the closure with the public. As soon as the perpetrator was removed, Sunspot resumed all operations.

Discussion: Cross-Walking Databases to Increase Efficiency and Improving the Experience for Driver's License (DL) Renewals

Alicia Ortiz, acting director, Motor Vehicle Division (MVD), Taxation and Revenue Department, provided background on the federal REAL ID Act of 2005 and described the process to obtain a DL or identification (ID) card. The REAL ID Act of 2005 created new standards for the issuance of a REAL ID DL or ID card to be used for federal purposes. Required documentation, consistency among documents and all rules regarding the REAL ID Act of 2005 are controlled by the federal government, but the act also gives states the ability to issue a "second-tier" DL or ID card that will function as valid identification but cannot be used for federal purposes.

The process of applying for a REAL ID DL or ID card has been arduous and overly complicated for many New Mexicans. Ms. Ortiz stated that the MVD is collaborating with stakeholders such as the Department of Health (DOH), the district courts and advocacy groups to mitigate this difficult process. One of the most common issues people have reported is the difficulty of providing all required documentation with the same full or legal name, often because of a change in name due to marriage, divorce or legal versus preferred name. In some cases, applicants have been required to correct their birth certificates or social security cards.

In New Mexico, REAL ID implementation began in 2016. Since then, 724,000, or 40 percent of, active DLs and ID cards have been converted, with an additional 880,000 that still need to be converted. However, the old DLs and ID cards will still be valid as identification until 2020 and will remain valid for driving purposes in New Mexico until the expiration date.

Mark Kassouf, chief, Vital Records and Health Statistics Bureau, DOH, described the issues a person may face when obtaining a birth certificate. One major problem for some customers is getting to the bureau, especially for elderly individuals or those that live on reservations or in other rural areas. Mr. Kassouf outlined a few solutions that the bureau is considering to alleviate this burden on people:

- install kiosks in MVD offices for individuals to access their vital records;
- implement an online index of birth and death records that is accessible across the state;
- expand local offices and community events to reach more rural residents;
- allow online credit card ordering to expedite delivery of birth certificates; and
- add a building for vital records to the main MVD office.

Responding to questions from the committee, Ms. Ortiz stated that for minors that still live at home and typically do not have bills in their name, their identity can be verified with a school report card or a letter from a community organization. The two proofs of residency are required under state law; the REAL ID Act of 2005 only requires one. If someone wants to use a social security card to apply for a REAL ID but has a new legal name, the individual would have to update the social security card but could alternatively update work documents, such as the tax forms or paystubs.

A second-tier DL or ID card can be extended beyond the initial year, and passports can be used in place of a birth certificate. The MVD website provides an interactive tool called "Real ID Companion" that gives step-by-step instructions for individuals to verify that they have all the required documentation before going to the office.

Wait times at the MVD have increased from an average of 10 minutes to over two hours since the implementation of the REAL ID Act of 2005. Despite less than half of active DL's and ID cards being converted so far, the goal of the MVD is to complete the remaining conversions in 2019, ahead of the 2020 deadline. Lastly, Ms. Ortiz said that the MVD is working to ensure that MVD employees across the state are receiving uniform training and information regarding the REAL ID Act of 2005.

Adjournment

There being no further business before the committee, the fourth meeting of the STTC for the 2018 interim adjourned at 11:55 a.m.