MINUTES OF THE
SENATE SELECT COMMITTEE ON ECONOMIC GROWTH AND EMPLOYMENT

Seventy-sixth Session
May 6, 2011

The Senate Select Committee on Economic Growth and Employment was called to order by Chair Ruben J. Kihuen at 1:15 p.m. on Friday, May 6, 2011, in Room 2149 of the Legislative Building, Carson City, Nevada. The meeting was videoconferenced to the Grant Sawyer State Office Building, Room 4412, 555 East Washington Avenue, Las Vegas, Nevada. Exhibit A is the Agenda. Exhibit B is the Attendance Roster. All exhibits are available and on file in the Research Library of the Legislative Counsel Bureau.

COMMITTEE MEMBERS PRESENT:

Senator Ruben J. Kihuen, Chair
Senator John J. Lee, Vice Chair
Senator Valerie Wiener
Senator Mark A. Manendo
Senator Don Gustavson
Senator Ben Kieckhefer

COMMITTEE MEMBERS ABSENT:

Senator Greg Brower (Excused)

STAFF MEMBERS PRESENT:

Kelly Gregory, Policy Analyst
Bryan Fernley-Gonzalez, Counsel
Debra Carmichael, Committee Secretary

OTHERS PRESENT:

Timothy L. Porter, Dean, Professor of Physics, College of Sciences, University of Nevada, Las Vegas
Ryan A. Heck, J.D., Ph.D., Patent Counsel and Director, University of Nevada, Reno–Desert Research Institute Technology Transfer Office
Eric Ebenstein, Director and Counsel, Domestic Policy, TechAmerica
Ray Bacon, Nevada Manufacturers Association

Walt Borland, Executive-In-Residence, Nevada Institute for Renewable Energy Commercialization
Marcia Turner, Ph.D., Vice Chancellor for the University of Nevada Health Sciences System, Nevada System of Higher Education

CHAIR KIHUEN:
The meeting is now open and it will start with presentations.

TIMOTHY L. PORTER (Dean, Professor of Physics, College of Sciences, University of Nevada, Las Vegas):
We strongly support a long-term, strategic, focused and statewide science- and technology-based economic development strategy for the State. Higher education can be an economic engine contributing to the statewide effort.

In 1980, Congress passed the Bayh-Dole Act which allowed faculty at universities to take ownership of, and potentially profit from, federally funded research projects. The same faculty research projects that have been going on at universities for decades, funded by the National Science Foundation, the U.S. Department of Energy and the National Institutes of Health could now be used to make money for the faculty, universities and for the states in which the research endeavors took place. After the Bayh-Dole Act was passed, many universities began to open technology transfer offices on their campuses. A few states began to take this economic opportunity to a higher level.

The San Diego miracle, which began in the 1980s, totally changed the economic climate and moved it toward a science- and technology-based economy, diversifying from what had been there previously. In Arizona, they are working on a ten-year plan to diversify their economy based on science and technology, with their three major research universities being the drivers for that economic development. Utah started a statewide program called USTAR through which the University of Utah and Utah State University are receiving specific, highly targeted investments to grow science and technology that can eventually evolve into economic development and diversification.

The University of Las Vegas Intellectual Properties (IP) Development Flowchart (Exhibit C) illustrates an economic development pipeline that focuses on key components when universities become involved in science and technology based economic development. The new ideas, the medical and engineering devices, the therapies and inventions of all types that relate to science,

engineering and technology originate from university research partnerships, faculty, staff, students and university resources. These ideas feed into some sort of research or invention disclosure. The disclosures are triaged by a technology transfer office at the institution. They are looked at for patent ability, economic development potential and the marketability of the idea. If the idea is determined to have some potential, the IP committee may decide to go forward with patenting and protecting the intellectual property that has been discovered.

The IP may feed into an entity which could be a limited liability company whose sole member is the nonprofit such as the University of Nevada, Las Vegas (UNLV) Foundation. This will enable the entity to potentially take equity stakes to own stock in new companies that may arise from inventions or ideas. Universities in Nevada are not legally allowed to own equity stakes in companies. These types of entities are needed in Nevada so equity stakes can be taken in the new ideas and then provide an avenue for payback. Other states that have the same constitutional legal problems as Nevada have done this. These entities are not new and are very easy to set up. An immediate licensing agreement may be initiated if a company that has an interest in a new invention comes in from the outside. The agreement will bring money to the inventor, universities and the state. That company may take the invention and run with it and develop it further. A track the invention may take is the formation of a new company which may require incubation. Most local cities and counties have wet lab science and technology business incubators which are not university facilities, but owned by the cities or counties. They can be utilized by new companies taking their inventions to the next level and building prototypes to attract angel investors, venture investors or other types of investments to get into the marketplace and succeed. The intent is for a stand-alone business that sells profitably and feeds profits back into the entities that built the enterprise.

This pipeline is needed in Nevada for success in a statewide, focused and organized effort to economically diversify in the areas of science and technology. If one of the components along the pipeline is weak or missing, the pipeline would be shut down and failure would be a risk.

The biggest single reason most new ventures fail is the lack of capital, angel investors, venture investors or federal grant money. This is called the “Valley of Death.” We need to work together with our partners, universities and local small

and big businesses to devise mechanisms to traverse the Valley of Death to give the startup companies a reasonable chance for success in the marketplace.

One way to start a statewide, focused, common sense science- and technology-based development process is to embark on a ten-year plan for economic development in the State. A road map might begin with an analysis of core competencies in the sciences, engineering and technology. We should ask ourselves, what core competencies can be mined and what selected investments can be made which may have a high probability of return? What are the areas where Nevada will not be directly competing with what goes on in California or Arizona or Utah?

The biosciences are an incredibly broad area that includes bioengineering, biomedical engineering, biomedical science, biochemistry, biophysics and bioenvironmental subjects. Other states are involved with these, but there are avenues Nevada can mine to move our economy into these high-paying areas.

Energy is another area already identified by Legislators, which involves photovoltaics, geothermal energy, wind and energy transmission. Nevada needs a statewide road map process that involves higher education, government and business where it can identify and invest in those areas.

SENATOR KIECKHEFER:
What currently happens to IP that is developed at UNLV?

MR. PORTER:
We mine research disclosures from the faculty. The disclosures go to the UNLV IP Committee and then are triaged.

SENATOR KIECKHEFER:
Where does the IP go after the UNLV IP Committee has determined it should be patented?

MR. PORTER:
We pay the money to outside counsel and try to patent the IP.

SENATOR KIECKHEFER:
Is there a method to market the patent?

MR. PORTER:
There is no structure for that right now. We know this is an area we have to grow into.

SENATOR KIECKHEFER:
How many patents does UNLV hold?

MR. PORTER:
We have about a dozen in our portfolio.

SENATOR KIECKHEFER:
Are any of them generating revenue for the university?

MR. PORTER:
They are not. Because we have taken a random approach to IP development where faculty patented what they wanted and we did not have the statewide effort to invest in the most lucrative areas, this is where we end up. We have a suite of patents that sit on a shelf and do not generate money. This is one of the things we want to change.

SENATOR LEE:
What is a wet lab?

MR. PORTER:
A wet lab is an actual laboratory geared toward science, engineering and technology. It has running water and a chemical fume hood. A prototype device could be developed, built and tested in the laboratory facility. More importantly, the incubator becomes a showcase for the new inventions.

RYAN A. HECK, J.D., Ph.D. (Patent Counsel and Director, University of Nevada, Reno–Desert Research Institute Technology Transfer Office):
Today I will talk about the role of Nevada's higher education and research institutions in economic development (Exhibit D). The University of Nevada, Reno (UNR), and the Desert Research Institute (DRI) are active partners in economic development. Some of the key factors of economic development are workforce development, leveraging State funding, industry collaborations and technology transfer.

An educated workforce is important to serve the existing industries and to attract new industry to relocate here. Places like Seattle have suffered little from the economic downturn because they have a highly educated population. The more educated populations there are in Nevada, the more likely it is to attract the kinds of industries that will produce the jobs desired for the State. If there are strong universities, employers are encouraged to relocate here because they can get their children good educations.

Both UNR and DRI leverage state funding to have an additional economic impact to help the State. My salary is paid for by grants; not a dime comes from the State.

Some faculty members are actively working with industry on collaborative research projects. We provide services for them such as contractual research, that benefits their industry and gives them a skill set they may not have in-house. We are also providing opportunities for our students, additional funding and making it a more attractive business climate.

The technologies that come into UNR and DRI are assessed for potential market value and whether they can be licensed or become a basis for a startup company. For example, Load IQ, formerly know as IBUCS LLC, created a device that measures the electrical signal coming into a house or business. The signal is broken up and identified in components that use electricity in the house or business. Load IQ has signed a license agreement with DRI for technology they developed while as DRI faculty members. They obtained a National Science Foundation Small Business Innovation Research Program Phase II grant for $500,000 to further develop their product. Another example is a company was started out of research that occurred at the UNR School of Medicine. One of the faculty members came up with a potential treatment for muscular dystrophy. That technology was licensed to Prothelia which is attempting to get investor funding to move this through the clinical approval process. This has the potential to bring in millions of dollars a year in licensing revenue. Not every technology that comes out of UNR or DRI has the financial potential of Prothelia, but there are some.

The key lacking component is communication between our institutions and industry. Most of the faculty comes from an environment where they are used to doing things that academic professors do. They do the research they want to do, educate students and apply and get grants from the federal government. In

most cases, they do that without interacting with industry. That makes my job difficult because when they come to me with a technology, it may not have any direct relevance to what industry actually needs. Trying to market those technologies can be difficult. If faculty was working more closely with industry and had an idea what industry could actually use, then perhaps faculty would produce things with a greater immediate market potential. Faculty neither knows how to work with industry nor why it is in their interest to do so. On the flip side, many companies do not know how to work with the faculty. Relationships with many companies are productive, but money and time are best spent increasing the communications with industry. However, there are limited resources to carry out this mission.

When my office was fully staffed, it consisted of three people. Similarly sized institutions across the Country have six or seven people to carry out the responsibilities with which we are tasked.

There is no money for gap funding so when faculty comes up with early stage technologies, there is no money to move it to the next stage. Typically, the technologies are so early stage, they are not immediately going to be a marketable product. Industry looks at it as another research and development project that they will have to spend millions of dollars on over a number of years to figure out if it will be a product. Money for the gap funding would help us move the technologies forward to license them or get outside investment money. Increasing the communication up front between faculty and industry is critical so technology can be moved forward without a big gap before implementation.

There were funds available at UNR called the Applied Research Initiative (ARI). If industry was willing to sponsor some research at UNR, UNR had a pool of money they could use to match the investment by the industry. Essentially, small companies could double their money by working with the University. The ARI funds were the first to go when budget cuts came around. Those types of funds are valuable in stimulating industrial partnerships.

The interplay between science and business needs to be emphasized. Entrepreneurship means breaking out of a traditional siloed approach. This means getting faculty out of their labs and talking to industry, having our engineers talk to business people and having business people talk to the science

people so the combination of business expertise and science expertise will make the innovative science projects successful.

SENATOR KIECKHEFER:
What do you need from a policy prospective?

MR. PORTER:
We need an organized effort to bring state government, businesses and higher education institutions together to officially adopt a long-term strategic economic development plan that involves all three groups. This would show people that we are more serious about this.

ERIC EBENSTEIN (Director and Counsel, Domestic Policy, TechAmerica):
TechAmerica is the biggest high technology trade association. We represent about 1,200 companies. Across the states, TechAmerica advocates for or against regulatory policies that increase the likelihood of development. Business-friendly policy attracts new investment. Technology companies are very mobile and will go where the best venue is. One of the largest grossing industries for technology companies is servers. Places to house data or servers can be sited virtually anywhere. Technology companies will look for the best regulatory regime and best access to talented people and then compare states.

TechAmerica has a foundation that produces educational reports. The most well-known report is called *Cyberstates.* We use the most recent available information from the U.S. Census Bureau and the U.S. Bureau of Labor Statistics to see what is happening in each state in terms of technology policy. Our research arm sifts through the data and determines how many technology jobs are in each state, what the average salary is and how the average salary contrasts against nontechnology private salaries. The states are ranked against each other as well as the top 60 cybercities. This is an effective way to chart technology policy and job growth.

In Nevada, there are nearly 30,000 technology-based jobs, which pay an average of $71,000 a year. Contrasted against an average of nearly $41,000 a year for other nontechnology sectors, that is a 71 percent premium for technology jobs over nontechnology jobs in the State. Even during the downturn, it took a little longer for the technology sector to get hit; it did get hit, but at a lesser extent than the nontechnology sector. These highly sought after jobs are staffed by technical-minded people.

One of our member companies is Varian Medical Systems which has a huge Las Vegas operation. They have 200,000 square feet of space with five buildings and employ over 300 people. Varian hosts around 3,000 people at their Las Vegas facility for one to six weeks of training on different aspects of oncology. Varian is the largest renter of cars in Las Vegas, booking over 26,000 nights in area hotels.

Our investment in the states has primary and secondary benefits. State support in stem education initiatives and funding is a way to ensure Nevada keeps on growing and producing people who can work in these companies. In state rankings, Nevada is somewhere in the middle to the second half of the Country, twenty-fifth in average high-technology wage positions but thirty-eighth in high-technology employment. The easiest way to change that is with friendly regulatory policies, contributing to and allowing an environment where the kind of people who would be hired by these companies come from the educational systems in the State.

CHAIR KIHUEN:
Are you working with TechAmerica and the Nevada System of Higher Education (NSHE)?

MR. EBENSTEIN:
Unfortunately, I have not been directly involved with that.

CHAIR KIHUEN:
We previously had a meeting with several CEOs, the NSHE, the Senate Majority Leader and the Assembly Speaker where we discussed ways to realign the curriculum at the university level to make sure Nevada is producing enough students who can meet the needs of the technology industry and the new technology industries.

RAY BACON (Nevada Manufacturers Association):
Five people from the State went to Georgia to look at their data quality program. Georgia has an industry alliance that sets a general direction for technologies in which the industry leaders believe Georgia needs to go. Georgia decided about 15 years ago it wanted to get into nanotechnology, even though it did not have a name at that time. Georgia Tech bought a program from Arizona State University and literally took the professors and the graduate

students and moved it to Georgia. It was quite successful, as they are the leaders in that field now.

At the 30,000-foot level, a group looks at the coming technologies the state should invest in to create the jobs of the future. The program started in Georgia roughly 20 years ago because they recognized the textile industry was going away, the agricultural base was changing and they needed to do something else because what they were doing was not going to work any longer. The same process took place in North Carolina where they developed the Research Triangle because tobacco and the textile industry were going away, and they needed to find something else or they would not have jobs.

The Georgia technology program feeds to the P-20 Council, which is made up of the heads of all education organizations and the governor's office. The program is a coordinated effort, unlike our P-16 Advisory Council where there is no staff, no support and no one in a decision-making role. In the Georgia program, every person is at the table, has budget authority and personnel assignments. Most of the work is done with cross-functional teams, directions and time lines. Nevada does not have that ability because the structure and focus has not been created.

After the technologies flow through the P-20 Council, they go to the university system with specific directions. Faculty positions are funded by the state level of the consortium at the top. After going through the university system, they go to kindergarten through Grade 12 with expectations of what is needed. Many of the schools in Georgia are meeting expectations to get into the higher education system. It is a top-down driven program with specific directions.

For the last 40 to 50 years, Nevada's focus was on the tourism sector. That thought has changed. Georgia 20 years ago was where Nevada is now. The steps Georgia made are awesome, but they had the advantage of good economic times when they made that decision.

Georgia has 45 percent of their degrees in the technical programs versus the humanities programs. Nevada does not get close to that number. In 2010, Georgia Tech had about 1,600 Bachelor of Science (BS) degrees, about 800 masters (MS) degrees in engineering and 243 doctors of engineering. In Nevada's systems, that would be about a five-year supply for BS and MS degrees and a ten-year supply of doctorates. Georgia is serious about providing

programs that will lead to the jobs, and they are looking at the future. Nevada does not.

When I was a vice president of manufacturing at Bently Nevada, Inc., almost all our engineers were hired from California State University, Chico, because they had a program that fit immediately into our process. The good news is we were finding the right people; the bad news is they were not local people.

We visited Coweta County in Georgia which has three high schools. One of the schools is a technology charter community college combination. It is open from 6 a.m. to 11 p.m. Part of the time it is a charter school and the rest of the time it is a community college. Many of the same programs cross over from the high school participants to the college participants. Nevada's charter school law states schools are either a charter school or a community college, but not both.

WALT BORLAND (Executive-In-Residence, Nevada Institute for Renewable Energy Commercialization):

Nevada has a tremendous opportunity that is resource-constrained and organizationally constrained. On May 20, the Governor's Office, Lieutenant Governor's Office, the Office of the Commission on Economic Development along with the Nevada Institute for Renewable Energy Commercialization released a report called *The Silver Spark for Nevada*. The report went into great detail to look at the competencies within Nevada that differentiated our State from other states. We have phenomenal opportunities within our federal laboratories and private sector companies which could lead to additional innovation, commercialization of those new technologies, formation of new companies and creation of new jobs. *The Silver Spark's* recommendations included procuring an innovation intermediary that proactively works to bring the different organizations and individuals together. This is absolutely critical to connect the north-south, public-private sectors to do the things everyone has talked about today. We have innovation in the State, but it is just not in those traditional places.

Assembly Bill 449 has two important components, relative to what needs to be accomplished: the Governor's proposed Catalyst Fund and the proposed Knowledge Fund, which will give us the kind of funding to do the things we need to do.

ASSEMBLY BILL 449: Revises provisions relating to economic development. (BDR 18-726)

The Valley of Death is a real and serious problem in the State. Private investors will invest in companies and get them up and running; but as those companies begin to grow, they need access to capital. We are challenged in that regard because we do not have the private equity network in the State to help companies successfully come through their life cycle, be successful, create jobs and ultimately create a more vibrant economy for Nevada.

Senate Bill 75 is structured to help improve the financial return of the permanent school fund but also incentivize the creation of a private equity network in the State. We absolutely have to do that so the great work in the institutions of higher education, federal laboratories and companies can be commercialized, resulting in the formation of companies with the creation of higher paying jobs that come with good benefits.

SENATE BILL 75: Establishes a program to provide private equity funding to businesses engaged in certain industries in this State. (BDR 31-523)

I would encourage the Committee as a whole and the members as individuals to consider all the different aspects as you ponder your decisions in regard to the important opportunities because they truly will make a difference for the State.

MARCIA TURNER, Ph.D. (Vice Chancellor for the University of Nevada Health Sciences System, Nevada System of Higher Education):
Chancellor Daniel J. Klaich asked me to express his appreciation to the Committee for entertaining this very important discussion. Everyone did an excellent job of articulating what is in place today. The Nevada 2.0 conference is one example of the NSHE recognition that there is more that we can do, should do, want to do and are doing to enhance our ability to rise to the occasion and break through barriers to be more productive in bringing research to market and meeting the needs of the community. The discussion today is another important piece to move us forward. From a policy standpoint, having the Legislature participate in any way it can to help with the development of a long-term plan and break down silos is important and a great opportunity. One of the benefits of the hard times we are experiencing is everyone is thinking

harder, working together and being creative. The Nevada System of Higher Education is very supportive of this and committed to the process.

CHAIR KIHUEN:
Seeing there are no further comments, I adjourn the meeting at 2:22 p.m.

RESPECTFULLY SUBMITTED:

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Debra Carmichael,
Committee Secretary

APPROVED BY:

_____
Senator Ruben J. Kihuen, Chair

DATE: _____

EXHIBITS			
Bill	**Exhibit**	**Witness / Agency**	**Description**
	A		Agenda
	B		Attendance Roster
	C	Timothy L. Porter	UNLV IP Development Flowchart
	D	Ryan A. Heck	The Role of Nevada's Higher Education and Research Institutions in Economic Development