Annual Report

Joint Commission on Technology and Science

2019 Annual Report

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The Joint Commission on Technology and Science (the Commission) met four times in 2019 at various locations around Virginia, including NASA's Wallops Flight Facility on the Eastern Shore and Virginia Polytechnic Institute and State University in Blacksburg, with Senator John A. Cosgrove, Jr., chair, presiding. The main topics of the meetings were aviation and aerospace workforce and economic development, blockchain technology, sea level rise and coastal flooding, and Artificial Intelligence (AI) and facial recognition technologies.

Membership[1]

[1] Senator John A. Cosgrove, Jr., chairman; Delegate Glenn R. Davis, vice-chairman

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Delegate Terry L. Austin
Delegate Kathy J. Byron
Delegate Glenn R. Davis
Delegate Eileen Filler-Corn
Delegate Dave A. LaRock
Delegate Kenneth R. Plum
Delegate Mark D. Sickles
Senator John A. Cosgrove, Jr.
Senator Bill DeSteph
Senator Siobhan S. Dunnavant
Senator Adam P. Ebbin
Senator Mamie E. Locke

The Commission met on April 2, 2019, in Richmond to discuss the following topics:

2019 Interim Work Plan

Staff reported that no legislation had been referred to the Commission for the 2019 interim, and staff was therefore soliciting study topics from the committee at large. Staff presented a document composed of legislation, both passed and failed, related to science and technology from the 2019 Session. At this point, the discussion became broader. Senator Cosgrove indicated that aviation and aerospace continued to be a main area of focus for him, punctuating his statement by announcing that there would be a rocket launch at 4:30 p.m. on April 17 at Wallops Island.

Senator Cosgrove also highlighted cybersecurity as an important topic. He requested that staff work with the private sector to brief the group at least once this year on how the Commonwealth could provide the industry with better workforce development and promote innovation and growth in the industry.

Delegate Mark D. Sickles next introduced defense contracting as an important industry in the Commonwealth and asked that the Commission spend time studying how to promote more private sector investment in the Commonwealth.

Delegate Terry L. Austin indicated that during the mid-September Virginia Tech visit, he would be interested in learning more about the smart road and autonomous vehicles research that the university is conducting. Senator Cosgrove agreed and suggested that, given the amount of information Virginia Tech has to offer, a two-day meeting might be appropriate in September. He also asked that the visit include the College of Engineering and Department of Computer Science if the meeting there is confirmed.

Delegate Glenn R. Davis identified the reorganization of the now disbanded Secretariat of Technology as a viable study topic. The group agreed that gathering experts and thinking critically about this reorganization going forward is a worthwhile endeavor and within the purview of the Commission, as long as representatives of the Governor's administration are involved.

Developments in Blockchain Technology

Senator Cosgrove asked Delegate Davis, chairman of the blockchain subcommittee, to report on the status of developments in blockchain technology. Delegate Davis reported that although two proposed bills relating to blockchain technology from the 2019 Session failed, the work in progress on the topic will continue to move the issue forward. He indicated that he had spoken to two companies that have already demonstrated a use case for blockchain in the credentialing of providers in the health care industry. Senator Cosgrove indicated that blockchain continues to be an exciting new technology and asked Delegate Davis whether the blockchain subcommittee should continue to meet during the 2019 interim. Delegate Davis answered in the affirmative and agreed to continue leading the effort.

The following are summaries of the information presented at the Commission's meeting on July 1, 2019, at NASA's Wallops Flight Facility:

Presentation: Workforce Development at Northrop Grumman

Kristen Englert, Apprenticeships and External Partnerships Lead, Northrop Grumman

Ms. Englert's presentation focused on the steps Northrop Grumman has taken to find and train skilled workers. She highlighted a number of programs, some of which work with students as young as elementary school-aged. Some of the programs she highlighted include:

- Elementary school programs to enhance the pipeline of diverse and talented science, technology, engineering, and mathematics (STEM) students globally
- Greater Washington Partnership and Business Roundtable, which partners industry and academic programs to better develop undergraduate students for entry into the workforce
- Apprenticeships designed to bridge the gap between retiring experts and younger employees
- Tech academies, which are internal programs designed to scale up mid-level to high-level employees to become experts within their fields

Ms. Englert finished her presentation by emphasizing that Northrop Grumman works closely on such programs with competitors such as Boeing and Lockheed Martin. The company embraces the idea that a well-educated and skilled community of workers is important and that no one entity can fully develop a worker.

Presentation: NASA's Wallops Flight Facility Overview

Dave Pierce, Director, NASA's Wallops Flight Facility

Director Pierce gave a presentation on the activities and resources at NASA's Wallops Flight Facility on Wallops Island. The facility manages all of NASA's suborbital programs and assists with various orbital programs, such as the resupply of the International Space Station (ISS).

He also gave a brief overview of Rocket Lab, the newest tenant at the facility. Rocket Lab is a New Zealand company that, at the time of the presentation, was building its first launch pad in the United States on Wallops Island, with the ultimate goal of launching a rocket once every 12 days from it. The launch pad opened in December 2019.

Following the presentation, Commission members asked Director Pierce questions about various topics related to the facility, including small satellites and their orbital decay, sea level rise preparedness, and the current helium shortage.

Presentation: Mid-Atlantic Regional Spaceport Overview

Dale Nash, Executive Director, Virginia Commercial Space Flight Authority

Executive Director Nash gave a presentation about the Virginia Commercial Space Flight Authority (Virginia Space) and the Mid-Atlantic Regional Spaceport (MARS). Virginia Space, another tenant of NASA's Wallops Flight Facility, is a political subdivision of the Commonwealth and is modeled after the Port of Virginia. Virginia Space provides contracting services to NASA, the Department of Defense, and others and has been instrumental in continuing to develop the infrastructure at NASA's Wallops Flight Facility, including the new Payload Processing Facility that was nearing completion at the time of the presentation and opened in July 2019.

Presentation: SmallSat/CubeSat at NASA's Wallops Flight Facility

David Wilcox, Chief, Special Projects Office

Mr. Wilcox described the activities at NASA's Wallops Flight Facility involving small satellites and cube satellites (SmallSat and CubeSat). He reported that this was the biggest area of new research being conducted in the field and that about 140 companies were currently doing small satellites work.

The following are summaries of the information presented at the Commission's meeting on August 29, 2019, in Richmond:

Presentation: AI and Facial Recognition Technology

Delegate Lashrecse D. Aird
Sunny Singh, Founder, Soch, Inc.

Delegate Lashrecse D. Aird described to the Commission the origin of her interest in Artificial Intelligence (AI). She explained that because of the inherent, unconscious biases in human-created systems and the great potential for intentional harm from AI abusers, her goals are to adopt effective AI laws and regulations to guide the usage of data and technology and to train policymakers about emerging threats and opportunities, starting with a study, introduced to the General Assembly during the 2020 Session as HJ 59. Delegate Aird introduced Mr. Sunny Singh from Soch, Inc.

Mr. Singh gave an overview of what is meant by AI and discussed some of the opportunities that AI and facial recognition technology presents, with a particular emphasis on government services. He presented examples of ways AI can be utilized in health care, education, and criminal justice. He also discussed the consequences of not managing AI effectively, including fewer human jobs, decreased privacy, and increased costs of governmental services and crime rates.

Mr. Singh advocated regulations to target four general categories: data ownership, access to technology, sharing and agreements, and disclosures. He stated that the General Assembly should become informed on the opportunities and risks of AI technology and work with governmental subdivisions and the industry to plan for the future. Mr. Singh pointed out that the industry is especially interested in the certainty that accompanies regulation in this field.

Following the presentation, members discussed other potential abuses of AI. Specific risks that were mentioned were deep fake videos, which were the subject of HB 2678 (2019), and limitations and biases made when facial recognition is used on dark-skinned faces. This is especially relevant to errors made during police lineups.

The presentation concluded with the Commission expressing general support for the ongoing work. Some members expressed interest in involving the companies working with AI technology in future meetings.

Presentation: Aviation and Aerospace 2019 Update

Daniel "Bud" Oakey, President, Virginia Aviation Business Association

Mr. Oakey presented the result of various budget proposals for FY 2019 related to aviation and aerospace programs. Some items were included in the final 2019 budget, while others were not.

He asked that the Commission recommend the rejected budget items be included in the budget for FY 2020.

Mr. Oakey then discussed a new grant program created by the Department of Defense aimed at reducing the United States' reliance on foreign-made drones. He proposed creating an additional grant administered by the Center for Innovative Technology to attract the businesses that will be applying for the federal grant to produce their drone technology in Virginia. Members of the Commission expressed interest in the new idea, and Mr. Oakey committed to continue developing it.

The Commission members asked about a number of programs in Virginia related to early aviation workforce development. Some members expressed that while there are good programs aimed at enticing young people to the field, one barrier is burdensome regulations on flying drones.

Presentation: Draft Commonwealth Research and Technology Strategic Roadmap

Alan Edwards and Emily Salmon, State Council of Higher Education for Virginia

Mr. Edwards and Ms. Salmon presented the draft version of the Commonwealth Research and Technology Strategic Roadmap (the Roadmap), which the Virginia Research Investment Committee (VRIC) is required *by statute* to submit to the chairman of the Commission. The Roadmap is meant to guide the funding decisions for research institutions. They agreed to discuss the details of the Roadmap in more depth at the next Commission meeting; the Roadmap will likely be final at that time.

The following are summaries of the information presented at the Commission's meeting on December 4, 2019, at Virginia Tech:

Presentation: Cybersecurity Opportunities in Virginia

Stephen Moret, CEO, Virginia Economic Development Partnership (VEDP)

Mr. Moret presented an overview of employment and growth in the cybersecurity sector, including opportunities to strengthen Virginia's position in the cybersecurity industry, and the Virginia Economic Development Partnership's (VEDP) current and future business development efforts for the industry. Mr. Moret reported that Virginia's cybersecurity industry differs from its aviation industry because the Commonwealth is already a leader in the cybersecurity field and is well-placed in terms of the number of jobs and the number of industry-certified workers. He noted that Virginia's success has stemmed from programs such as the Commonwealth Cyber Initiative, the Tech Talent Investment Program, and the Mach37 Cyber Accelerator.

The cybersecurity industry as a whole is also strong, accounting for a large percentage of technology sector growth and jobs. The maturity of the sector means that pure cybersecurity employment growth is expected to slow down in the near future, particularly in Virginia as compared to other states, but Mr. Moret said that interdisciplinary understanding of cybersecurity is expected to be integrated into business at all levels. He added that cybersecurity has been solidified as an essential aspect of business.

Mr. Moret reported that VEDP expects two main areas of growth: regional diversity and private sector. He said that cybersecurity occupational employment is highly concentrated on federal contracting in Northern Virginia. As such, VEDP is hoping to expand opportunities to rural areas and in the private sector. Virginia is well-placed to expand these opportunities because of its

skilled workforce and talent pipeline, including strong university programs throughout the state, numerous research and partnerships, and access to broadband and fiber Internet. VEDP has focused attention on this growth by appointing a dedicated cybersecurity leader, Megan Welch.

The Commission members asked numerous questions. Some concerns were raised regarding reports of difficulty in obtaining security clearances. Mr. Moret responded that, indeed, backlogs at the federal level have left some 20,000 jobs open while prospective employees await clearances. Other questions pertained to specific companies or projects such as rural and small metro tech centers, which are projects of 200 to 1,100 workers that attract newer college graduates to less-populated areas.

Presentation: Virginia Academy of Science, Engineering, and Medicine

Dr. Jim Aylor, President, Virginia Academy of Science, Engineering, and Medicine
Dr. Jennifer Irish, Co-Chair, Securing Prosperity in the Coastal Zone Summit

Dr. Aylor began his presentation with the history of the Virginia Academy of Science, Engineering, and Medicine (VASEM) and information about its mission and programs, including the 2018 annual summit relating to coastal flooding and sea level rise. Following this overview, Dr. Irish discussed the findings and work product that arose from that summit.

Dr. Irish reported that much of the conversation at the summit was centered on the economic impacts of sea level rise and the most feasible means of preventing its negative impacts. While the summit was informative, she said, many questions remained about which solutions are truly viable and which are merely marketing. Accordingly, Dr. Irish and Dr. Aylor recommended that the Commission, in coordination with volunteers from VASEM, study the issue in 2020 and make recommendations to the 2021 Session of the General Assembly. They estimated that such a study would cost $125,000. The Commission generally seemed favorable to the recommendation, with many members expressing the importance of directing state funds efficiently to the most useful and critical projects.

Presentation: Facial Recognition: Facts vs. Myths

Michael McLaughlin, Research Analyst, Information Technology and Innovation Foundation

Mr. McLaughlin began by describing the Information Technology and Innovation Foundation, which is a public policy think tank committed to articulating and advancing a pro-productivity, pro-innovation, and pro-technology public policy agenda in the United States at the federal and state levels and internationally.

Mr. McLaughlin's presentation related to facial recognition software and the misconceptions about the technology. He said these include the inaccurate assumptions that (i) facial analysis is facial recognition, (ii) facial recognition is inaccurate, (iii) facial recognition does not work on people of color, (iv) facial recognition only has negative uses, (v) the public opposes the use of facial recognition, (vi) providers are storing millions of faces in online cloud storage, (vii) all facial recognition technology is the same, (viii) facial recognition will lead to a surveillance state, (ix) no laws govern the use of facial recognition, and (x) bans are the only solution for such concerns related to facial recognition technology.

Mr. McLaughlin concluded his presentation by recommending that the General Assembly (i) set performance standards for facial recognition, (ii) develop best practices, (iii) encourage pilot

programs, (iv) legislate guardrails to prohibit negative uses, and (v) consider broader oversight on appropriate police behavior.

Presentation: Final Commonwealth Research and Technology Strategic Roadmap

Alan Edwards and Emily Salmon, State Council of Higher Education for Virginia

Mr. Edwards and Ms. Salmon presented the final version of the Commonwealth Research and Technology Strategic Roadmap (the Roadmap), which the Virginia Research Investment Committee is required *by statute* to submit to the chairman of the Commission. The Roadmap is a coordinated and concerted statutory effort to fortify Virginia's economy through strategic actions and collaboration. The Roadmap identifies and focuses collaboration around sectors that offer the most promise for growing Virginia's innovation economy.

Specific areas of opportunity within Virginia's innovation economy include life and health sciences, autonomous systems, space and satellites, agricultural and environmental technologies, cybersecurity, and data science and analytics as identified in the Roadmap.

For more information, see the *Commission's website* or contact the Division of Legislative Services staff:

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