SJ30 Aviation Workforce Development Study

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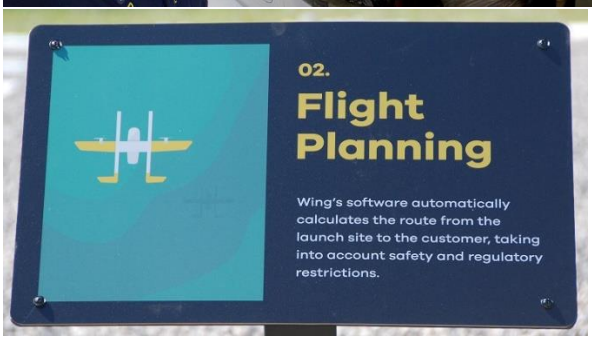

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During its regular 2020 session, the Virginia General Assembly directed the Department of Aviation (DOAV) to study whether any gaps exist in the development and preparation of the next generation of aviation professionals. Despite many challenges associated with the COVID-19 global pandemic, the DOAV established a Work Group comprised of a wide range of professionals from a number of state and federal agencies, the aviation industry (both manned and unmanned), and academia. The Work Group met three times in a virtual format during the autumn of 2020 to address its charge.

The Work Group identified five areas of concern:

- Lack of awareness;
- Cost;
- Infrastructure;
- Demographic disparities/lack of diversity; and
- Collective bargaining agreements.

Members of the Work Group know these areas of concern represent a number of difficult challenges, but they believe that, through a concerted effort and with the right support, success is highly likely.

The Work Group recommends the establishment of a small task force to focus on addressing the areas of concern. Membership on the task force would come from a subset of the SJ30 Work Group.

This task force would help:

- coordinate the efforts of the many and varied agencies, entities and organizations that are interested in addressing the lack of awareness issue;
- enhance aviation education opportunities in the schools;
- oversee the development of more and better outreach programs to be delivered to traditionally underserved audiences;
- address affordability concerns associated with entering the aviation workforce;
- maximize infrastructure resources;
- expand Virginia's G3 – Get a Skill, Get a Job, Give Back – program to include skilled trades for the aviation industry;
- work with airlines and labor unions to add some flexibility to the collective bargaining contracts that would permit internships and work/study arrangements to benefit both the students and the aviation industry.

SJ30 Aviation Workforce Development Study

Introduction

In 2012, the Performance Management Group in the L. Douglas Wilder School of Government and Public Affairs at Virginia Commonwealth University worked with the Virginia Department of Aviation (DOAV) to prepare a report titled "Virginia Aviation and Space Workforce Analysis and Strategy Development". This document proposed nine high-level strategy recommendations.

In 2017, DOAV engaged the Office of Economic Development at Virginia Tech to assess, expand upon and prioritize the nine recommendations and to propose effective, practical and actionable ways to implement those recommendations. This report is titled "Virginia Aviation & Space Career and Workforce Implementation Plan". (Full report plus appendices: https://doav.virginia.gov/contentassets/38059f3fdbef46c7b8da341638ef5c8f/27526-workforce-implementation-plan-plus-appendices-9-26.pdf) One of the key findings of this report was the projected deficit of aircraft pilots, aviation maintenance technicians and aircrew members. Citing the 2017 Boeing Pilot and Technician Outlook (a biennial study of the global aviation employment projections over a 19-year period), the authors of the workforce implementation plan stated that, between 2017 and 2036, there would be a need for 117,000 pilots, 118,000 aviation maintenance technicians and 154,000 cabin crew members just in North America. These figures have served as the cornerstone of the DOAV's aviation education and outreach effort since January 2018.

The General Assembly adopted SJ30 in its 2020 regular session directing DOAV to study the coordination of stakeholders within the aviation industry for economic and workforce development. In conducting its study, the Department is to convene a work group with representation from the aviation industry, the Virginia Department of Education, the State Council of Higher Education for Virginia, and other interested parties to explore issues related to the continued development of the aviation industry and workforce, in coordination with the Federal Aviation Administration and other responsible federal agencies.

Within days of the passage of SJ30, the Coronavirus grew into a global pandemic that brought air travel and the aviation industry to a near standstill. Stay-at-home orders were issued by nearly every state; flights were cancelled; and airports became virtual ghost towns. Airlines experienced a 90 - 95 percent decrease in passengers. The federal government stepped in with billions of dollars in funding to aid both airlines and airports through the CARES Act of 2020. Entities accepting these funds were required to keep employees on the payroll through September 30, 2020. Over the course of the last six months, passenger traffic has grown slightly as some states reduced restrictions and reopened in a limited capacity. Still, passenger traffic is running about 60 percent below what it was in 2019. With most industry experts and observers predicting that passenger counts will not return to pre-COVID levels until at least 2023 and the no-layoff provision of the CARES Act having expired September 30, airlines have furloughed tens of thousands of employees in all areas of operations. (CARES 2, passed in late December 2020, has extended layoff provisions through March 31, 2021.) In addition, thousands of employees accepted early retirement or buyout packages from their employers as the airlines worked to reduce staffing levels that would be sustainable at the reduced passenger count level.

This global pandemic has turned upside down all of our guiding principles and assumptions as they relate to aviation education, outreach and workforce development. The pilot, aviation maintenance technician and cabin crew jobs that were "begging" to be filled less than a year ago are being eliminated, at least in the short term, as the airlines retrench and restructure. Because it takes many years to educate and train pilots and maintenance technicians, however, we cannot allow this current crisis to dictate our actions five, 10 or 15 years into the future. If we are to have competent, capable and an adequate number of people to fill these roles, we must continue to facilitate their preparedness for the workforce opportunities that are ahead.

Pilot and Technician Outlook

The need to continue aviation workforce development is supported by the most recent issue of Boeing's Pilot and Technician Outlook, which came out in the fall of 2020 and took into account the COVID-19 pandemic's impact on the industry. (https://www.boeing.com/commercial/market/pilot-technician-outlook/) Instead of a reduction in demand as one might expect, this latest issue of the report shows an even greater demand for both pilots, aviation maintenance technicians and cabin crew members through the year 2039.

The following is from the opening paragraphs of Boeing's latest report:

Meeting the projected long-term demand will require a collective effort across the global aviation industry. As tens of thousands of pilots, technicians and cabin crew members reach retirement age over the next decade, educational outreach and career pathway programs will be essential to inspiring and recruiting the next generation.

While the current industry downturn, driven by COVID-19, has resulted in a temporary oversupply of qualified personnel, the long-term need remains robust. In recent decades, aviation has experienced external forces that have affected demand, such as 9/11, SARS and the Great Financial Crisis. Recovery has generally followed several years later, as the fundamentals driving passenger and air traffic demand remain strong.

Prior to the downturn, the commercial aviation industry was poised to experience a shortfall of qualified pilots and technicians. Analysis of new licenses and certificates issued over the past few years had indicated that the number of new personnel entering the industry was lagging demand. The short-term oversupply allows operators the opportunity to build their pipeline in anticipation of growth returning in the next few years.

Some personnel who are currently furloughed because of the market downturn will find employment in the government and business and general aviation sectors that have previously struggled with shortages amid surging commercial demand. Additionally, as commercial traffic demand returns in upcoming years, aspiring aviators will have the opportunity to fill open positions created by a combination of personnel retirements and fleet growth.

Amid challenges posed by COVID-19, the training industry has begun to adopt increasingly innovative solutions. Many providers have transitioned their offerings to online and virtual formats where possible,

allowing students to continue their learning safely. Immersive technologies, adaptive learning and flexible distance learning methods are also being explored to enable optimum learning and knowledge retention. Investments in technology that are being made today will likely lead to a long-term fundamental shift in how training is conducted.

Competency-based training and assessment programs are gaining traction, which enables a shift from prescriptive, task-based training to a more holistic approach. Advances in adaptive learning capabilities, artificial intelligence and learner analytics will further personalize training to the individual student so that greater emphasis can be placed on closing knowledge gaps.

As the industry navigates the market downturn, effective training and an adequate supply of personnel remain critical to maintaining the health, safety and prosperity of the aviation ecosystem.

Boeing used the following methodology to prepare its report:

New personnel demand is calculated based on a 20-year fleet forecast for commercial aviation aircraft with more than 30 seats, business jets and civil helicopters. Based on fleet growth, aircraft utilization, attrition rates and regional differences in crewing specific to aircraft type, Boeing's Pilot and Technician Outlook estimates the number of new pilots, technicians and cabin crew members needed worldwide. Slight variations to the forecast can occur on a year-over-year basis as a result of many factors, some of which include changes in regulations, crew productivity and aircraft mix. The forecast does not currently include assumptions for single-pilot commercial operations or autonomous airplanes. We continue to track the market for indications of regulatory movement and will update our forecast accordingly.

In North America, **Boeing predicts a total demand for 569,000 new personnel in the aviation industry** between now and the year 2039. That number includes **208,000 new pilots**; **192,000 new aviation maintenance technicians**; and **169,000 new cabin crew members**. This represents an increase of 77 percent over the 2017 figures for pilots; a 63 percent increase over the 2017 figures for aviation maintenance technicians; and a nearly 10 percent increase over the 2017 figures for cabin crew members. (Global demand for pilots, technicians and crew members will exceed 2.4 million new workers through 2039, according to the report.)

SJ30 Work Group

The Virginia Department of Aviation established the SJ30 Work Group. It is comprised of the following people:

Mark Flynn, DOAV, Director and Chair of the Work Group
Vicki Cox, Virginia Aviation Board
Bud Oakey, Virginia Aviation Business Association, President
Mary Sandy, Virginia Space Grant Consortium, Director
Dr. Aaron Smith, Denbigh High School Aviation Academy, Program Administrator
Robert Hepp, Aviation Adventures
Felix Schapiro, Assistant Secretary for Workforce Development
Travis Williams, Averett University, Chief Flight Instructor
Dr. David Eshelman, Virginia Department of Education, Director of Workforce Development and Initiatives – Office of Career, Technical & Adult Education
Susan Yale, SCHEV, Compliance Investigator
Kevin Dallaire, Piedmont Airlines, Recruiting Manager
LaVern Phillips, Aviation Institute of Maintenance, Director of Business Development
Tariq Rashid, Wing US, Chief sUAS Pilot
Todd Estes, Virginia Community College System, Director of Career Education Programs & Workforce Partnerships
John Campbell, DOAV, Communications & Education Director
Betty Wilson, DOAV, Public Relations & Education Manager

(NOTE: Two employees of a U.S. government agency served as liaisons to the SJ30 Work Group. However, we cannot identify them or acknowledge their participation due to a non-disclosure agreement that was mandated by their employer in order to allow their participation.)

Due to public health and safety protocols, the work group met virtually during the months of October (13 and 27) and November (17). The Virginia Space Grant Consortium hosted the three meetings using the Zoom platform. The meetings were recorded by the Zoom application, and the transcripts were forwarded to DOAV for its files.

The Task

The SJ30 Work Group began its efforts by focusing on these questions:

- What gaps still exist in the education and training of people who wish to become pilots and/or aviation maintenance technicians?
- What knowledge, skills and experience will manned and unmanned aviation employers need from future employees?
- What barriers exist and serve as impediments in the education/training process?
- Are there any as-yet untapped opportunities and resources available to ensure success?
- Is there more the aviation industry can do to facilitate this? How about local, state and/or federal governments?
- Are there existing programs/models out there that Virginia could emulate?
- What will happen if we do nothing more than what we're doing at present?

Gaps Identified (Transcript summaries of group discussions are provided in the appendix of this report.) The group's discussions quickly led to several issues/themes indicating that gaps still exist. These are:

- Lack of awareness
- Cost
- Infrastructure
- Demographic disparities/lack of diversity
- Collective bargaining agreements

Lack of awareness

Work group members from both industry and academia were quick to point out that a huge challenge in workforce development is something very simple and very basic – lack of awareness. This lack of awareness ranges from basic familiarity with the aviation industry to the types of aviation careers available to students. When you ask children what they want to be when they grow up, you typically hear them say "Policeman"; "Fireman"; "Doctor"; "Lawyer"; "Teacher"; or "Nurse". Occasionally, one might say "Pilot", but it's highly likely that not one will say "Aircraft Maintenance Technician"; "Air Traffic Controller"; "Aircraft Engineer"; "Cabin Crew Member"; "Drone Pilot"; "Aviation Data Analyst"; and so on. Even with a concerted effort by schools to push STEM education/careers, neither school counselors nor teachers are well versed in (or, in many cases, even familiar with) the aviation industry and its many opportunities.

If someone does want to be a pilot, it is typically because he or she has a family member who is a pilot. The older family member takes the younger one to the airport and takes her or him up in the airplane for a flight. That experience is the spark that becomes a passion. And that passion for flying is passed directly from one generation to the next – not usually from any classroom exposure or experience. This issue is even more pronounced for aircraft maintenance technicians. Gone are the days when a parent worked on a car side by side with a child to develop an understanding of what makes a vehicle work and what is necessary to keep it operating in a safe and reliable manner. That shared experience under the hood of a car could lead to someone wanting to take that knowledge and skill and apply it to an airplane engine, but, without that opportunity, the child is unaware of this potential career.

In the K-12 educational system, there are aviation lessons within the STEM curriculum but, with few exceptions, they aren't widely used because instructors are unfamiliar with the material; there are time constraints associated with meeting the standards of learning; there is a lack of resources within school divisions to support the aviation curriculum, and so on. In fact, only 10 Virginia school divisions offer any aviation or aerospace courses (five offer aerospace technology; five offer aerospace engineering; two offer pilot training; and only one – Newport News' Denbigh Aviation Academy – offers classes in aviation maintenance, air traffic control, and aviation operations management as part of its aviation career pathway program.

Cost

No one will deny that a high-paying career in aviation comes at a relatively high cost. Someone wanting to learn how to fly a small, private aircraft could easily spend $10,000 to $25,000 for lessons, aircraft rental, fuel, certified flight instructors, medical examinations, etc. Studying to be a pilot at one of the three private universities (Hampton, Averett, Liberty) that offer this program in Virginia costs

approximately $50,000 per year in a four-year program. In addition to this initial investment, a prospective pilot would also have to accumulate 1,500 hours of flight time to qualify as a commercial airline pilot.
For those interested in becoming an aircraft maintenance technician, the cost would be approximately $20,000 at Blue Ridge Community College (Harrisonburg); $30,000 at Liberty University, or about $50,000 for the 20-month program at the Aviation Institute of Maintenance (Norfolk, Manassas).

There are some limited scholarships available to defray the cost of some of these programs but not enough to encourage the number of graduates needed by the aviation industry. For students studying aviation at the university level, a number of airlines have developed programs to hire students during their sophomore year, which helps pay the bills associated with their studies. But, even with this vital program, qualified pilots remain in short supply. (As airlines offer higher wages to secure talent, that often removes qualified instructors from flight schools and universities who choose to follow the more lucrative path of pilot instead of teacher. And less teachers means fewer students can be trained.)

Infrastructure

Unlike in an automotive shop class where a school could go out to a junk yard and purchase a used vehicle engine for a couple of hundred dollars, even a small aircraft engine would be tens of thousands of dollars while a jet engine for an airliner would be millions of dollars for a single unit. With an enrollment of 200 students in an aviation maintenance technician program, a school would need several engines of different types and sizes to serve the students' educational needs.

If the Aviation Institute of Maintenance wanted to add a third campus in Virginia to meet the industry's need for technicians, it would need more than $1.5 million to get the doors open and it would expect to lose money for at least the first three years of operation. That is not an option. So, to add students to either AIM's program, Blue Ridge's program or to Liberty's program, the only cost-effective and feasible way would be to scale up operations at the existing sites. There are limits, however, to expanding the infrastructure at all four locations. Some investment would be required, but it would mean that additional students could be served this way.

Demographic disparities/lack of diversity

At present, aviation is overwhelming comprised of White males – an outcome of some of the already identified issues facing the industry. According to the Federal Aviation Administration and Women In Aviation International, just 6 percent of pilots are women (and the percentage is even smaller for women mechanics). Blacks also comprise just 6 percent of aviation's ranks. Even though colleges, universities and the aviation industry are pushing to increase diversity within their ranks, with little or no exposure to aviation programs in schools or through guidance counselors; limited financial means; and the lack of an aviation role model in the family, women and people of color are at a distinct disadvantage of ever becoming aviation professionals.

Collective bargaining agreements

Many airline employees work under collective bargaining agreements that dictate conditions of employment. One such condition is that senior employees get first choice of work locations. On the positive side, Virginia is considered to be a desirable place to work by many of these experienced

workers. With that being the case, these senior employees choose to work in Virginia instead of other locations, such as San Francisco, New York, Philadelphia, that are seen as less desirable. For a young person coming out of a Virginia-based aviation educational program, this system almost forces these new hires to leave the Commonwealth and be assigned to one of these less desirable work locations. While some may view this as an opportunity to explore new areas, many younger Virginians see this as a negative and are not willing to move away from family and friends. Instead, they may turn down the out-of-state airline position and choose another occupation in order to remain in the Commonwealth. So, whether they accept the position and move or reject the job and leave the aviation field, this new generation of prospective aviation professionals ends up not serving aviation's current needs in Virginia.

Closing these Gaps

The work group believes that there are viable solutions for all of these issues. First and foremost, the work group recommends the establishment of a small task force drawn from members of the SJ30 Work Group.

This task force can help:

- coordinate the efforts of the many and varied agencies, entities and organizations that are interested in addressing the lack of awareness issue;
- enhance aviation education opportunities in the schools;
- oversee the development of more and better outreach programs to be delivered to traditionally underserved audiences;
- address affordability concerns associated with entering the aviation workforce;
- maximize infrastructure resources;
- expand Virginia's G3 – Get a Skill, Get a Job, Give Back – program to include skilled trades for the aviation industry; and
- work with airlines and labor unions to add some flexibility to the collective bargaining contracts that would permit internships and work/study arrangements to benefit both the students and the aviation industry.

Resources

1. "Virginia Aviation & Space Career and Workforce Implementation Plan" https://doav.virginia.gov/contentassets/38059f3fdbef46c7b8da341638ef5c8f/27526-workforce-implementation-plan-plus-appendices-9-26.pdf)

2. Boeing's 2020 Pilot and Technician Outlook Study https://www.boeing.com/commercial/market/pilot-technician-outlook/)

3. Virginia Space Grant Consortium's Workforce Development Report for the UAS industry in Virginia https://vsgc.odu.edu/geoted-uas/unmanned-aircraft-systems-uas-workforce-survey-report/

4. Current Statistics of Women in Aviation Careers in U.S.A. https://www.wai.org/education/resources/women-aviation-stats

5. Federal Aviation Administration Statistical Data
https://www.faa.gov/data_research/aviation_data_statistics/civil_airmen_statistics/

6. Aviation Institute of Maintenance Recruitment Video https://youtu.be/WNEsD0R38WM

Appendix

Transcripts from meetings one, two and three of the SJ30 Work Group.

SJ30 Work Group
Notes from Meeting #1
Oct. 13, 2020

DOAV Director and Work Group Chair Mark Flynn called the first meeting of the work group to order at 10:30 a.m.

In attendance: Mark Flynn; Vicki Cox; Susan Yale; Kevin Dallaire; La Vern Phillips; Dr. Aaron Smith; Bob Hepp; Betty Wilson; Todd Estes; John Campbell; Federal Employee 1

Mr. Flynn read the charge from the 2020 General Assembly and provided some "pre-COVID" context that the aviation industry was going "gangbusters" where a shortage of pilots, aviation technicians, dispatchers, UAS pilots, etc., were in high demand and numerous vacancies existed. In late March, the bottom dropped out and the aviation industry was dealt a devastating blow.

Because work force development in the aviation industry is a long-term effort, this significant downturn is projected to last through 2023, which means the SJ30 Work Group's charge remains valid and true. We must examine whether there is a lack of coordination and strategic planning for the future demands of the industry as well as internship and apprentice programs.

Mr. Flynn read through the list of questions that were developed to initiate discussions.

Mr. Phillips stated there's a lack of awareness within the school systems regarding the opportunities available in aviation. Teachers, guidance counselors, etc., have no idea what's out there; the income potential; career paths and progression. High school guidance counselors appear to be directing their students toward degree programs only. A degree is not needed for an airframe & powerplant mechanic whose average income is in the $60,000 to $64,000 range with a license.

Ms. Yale asked whether other states are better at informing high school students about the opportunities.

Mr. Phillips stated that public schools don't market the program/opportunity. That's left to schools like his (Aviation Institute of Maintenance). AIM has 13 FAA Part 147 schools with a total student enrollment in excess of 4,000. The FAA says that AIM produces about 20 percent of all new graduates each year.

Dr. Smith said we need to make a push into the middle and elementary schools as, by the time many students get to high school they have made up their minds and have selected a career path. Any new

initiatives should target elementary school students. Do more "career days" aimed at younger students then saturate them with the aviation industry's opportunities.

Ms. Cox stated that while most kids are aware of a career as a pilot, that is seen as hard to achieve and very expensive. There are several other aviation-related fields of which little is known. Focusing on these other opportunities might appeal to a larger swath of the population.
Mr. Estes said nothing makes or breaks a program more than occupational outcomes. There has to be employment. Employer engagement – bringing employers to the programs – is key to success. At the community college level the need is on whether students are getting hired and have the opportunity to engage with prospective employers.

Federal Employee 1 stated that while working on the strategic plan for STEM and aviation education this summer, they found a disconnect – no continuity of thought when starting with younger children and STEM education with regard to steering them toward possible opportunities. This strategic plan speaks to focusing on pathways and starting that at a much earlier age. Stay with science and math through your schooling and here are the many different opportunities available in the world of aviation. The focus has been on pilots, but there are many more aviation careers that are less visible. But what catches the eye – an engineering simulator or a flight simulator? What are more tactile and exciting ways to introduce the variety of careers? What can we do to introduce and excite career counselors?

Mr. Phillips said visibility is high for pilots as they are walking through the airport in uniform. People know pilots are making great money. But who is seeing the mechanic or the dispatcher? In Europe, instead of calling them mechanics, they have a more professional title (aircraft mechanical engineers). This says they are professionals; high-tech. "Mechanic" gives the image of overalls and a ball cap; one who isn't making a great wage.

Mr. Dallaire stated that his company has been attending the Virginia School Counselor Association's conference for the past several years. Over and over, the guidance counselors say they had no idea such careers existed. They know about pilots, but nothing with regards to aircraft maintenance dispatcher – it's just over their heads. Early education and bringing awareness is key.

Dr. Smith said when kindergarten students see an airplane, whether it's a Cessna or a 737, their eyes light up and that becomes a memorable impression that will be with them for a long time. Guidance counselors aren't likely to know who to contact with regards to aviation career opportunities. There needs to be a way for counselors to get that information and to be able to share it with elementary, middle and high school students through some sort of a network. This would be a huge asset for the schools and the aviation profession.

Mr. Flynn said he's hearing a consensus that any such programming should start as early as kindergarten. This goes beyond the current pandemic and means we need to work on early education throughout the K-12 systems to ensure students (and parents) understand these opportunities exist after high school.

Mr. Estes stated that getting to kids early before they are making decisions is important both at the elementary and middle school levels. Employer engagement again is important as is labor market information when talking about state-level investment. Is there a clear understanding of what the labor market demand for aviation is within the Commonwealth? (We have national and international data at hand, but what's the demand in Virginia?) Are there 400 jobs available to graduates or 10,000 jobs in Virginia?

Federal Employee 1 said to pay attention to the emerging careers in the aerospace sector. Look at UAS. There are six times more registered drones than aircraft. These offer phenomenal career potential to students. What will the future look like? What will things look like 20 years from now as Uber Elevate and other such organizations enter the market? There's a broad diversity of aviation careers already that don't have enough awareness.

Ms. Cox stated that a lot of teachers are not going to be well prepared to be aviation sector experts, especially from reading documents. NASA has shown how it can be done by providing some teaching tools. Should this work group recommend that various state agencies work together to access appropriate teaching packets and ensuring that they are distributed statewide?

Mr. Flynn said that AOPA has an outreach program for K-12.

Ms. Wilson said that DOAV offers grants to teachers, hosts the international aviation art contest, provides scholarships, and works with other groups that are providing similar programs. Awareness among teachers is key. DOAV regularly participates at the annual Virginia Association of Science Teachers conference.

Mr. Dallaire asked if anyone had mentioned "Choose Aerospace." This new initiative is hoping to get as close to a free curriculum as possible so that more young people can be exposed to the aviation maintenance curriculum as early as possible.

Mr. Flynn suggested it may be time to approach the leadership of the Virginia Department of Education and provide them with an organized program that they can get out to schools.

Mr. Phillips stated that AIM has been doing community engagement for several years and is also working closely with industry and airline partners such as PSA, United, Boeing. AIM offers a free summer camp to which it invites counselors to participate. Any camper 18 years or older can pass the exam and earn a drone (Part 107) license. AIM hosts open houses and has even taken dinner to schools for counselors in high schools. Also working with Denbigh H.S. to extend credit to high school programs operating as satellite locations of AIM. This enables AIM to get into the schools without having FAA approval of a separate facility, which would be difficult to achieve for most school systems.

Mr. Flynn asked what work group members saw as near-term (next two years) labor market demands for aviation.

Mr. Phillips said that passenger capacity is off about 40 percent but cargo is doing better than that. He said predictions are in the 80% to 90% range within a year.

Federal Employee 1 said that as the mechanic workforce is an older demographic and that workforce is nearing retirement. Pilot shortages are predicted but the mechanic workforce is an older demographic that remains a high concern.

Mr. Dallaire stated that his company's expectations are for a 3 year to 5 year recovery (data from IATA) for the airlines with three years for domestic passenger aviation and five years for international. Cargo, private aircraft and general aviation all offer additional opportunities. At present, the public is not confident in flying in a commercial aircraft even though all the research demonstrates that flying is safer than your own office. A vaccine should cause confidence to be restored. "Once people have places to actually go, when vacations can actually be held and countries open back up for a vacation, I think we'll start to see things get better."

Mr. Dallaire continued: mechanics are still retiring and all of the airlines just did massive early-out options; we had mechanics leave which was good in the short term, but all that's going to do is compound our retirement rate when we return to pre-COVID numbers. No retirement age for mechanics, but it's 65 for pilots, which means we'll still have pilot issues. Boeing has updated its pilot and technician outlook and this takes into account COVID. The 2017 study said there would be a need for 118,000 aircraft mechanics in North America. The latest study adds about 50,000 to that number, meaning there will be a need for 170,000 mechanics in North America.

Mr. Estes said near-term demand will be less but don't forget about attrition in the aging workforce.

Mr. Flynn moved the focus to existing gaps in aviation education and training. Getting into the K-12 system is one gap.

Ms. Yale stated that Virginia has either five or six aviation maintenance schools in the state while Florida has at least 12. Is the availability of aviation maintenance programs in Virginia an issue?

Mr. Phillips said there are 180 such schools nationwide and four states have no such schools while other states have just one school. California has 20 and Florida now has 14. Many of these schools have only 12 students in the program. An employer isn't going to visit such a school when looking to hire several mechanics. The employers will go to the schools with several hundred students and choose the better ones. Could the Roanoke area be targeted for a 147 program in the high school?

Mr. Phillips continued that state-supported schools don't market for students due to budgetary concerns. They don't have much of a budget, and the FAA aviation program is the most expensive program you can run and draws the least amount of students.

Mr. Estes stated that community colleges have to be good stewards of public resources so they will focus on those programs in which the citizens are getting jobs. If as La Vern said, an employer goes to a school with 200 students and hires two or three, what happens to the other 197?

Mr. Dallaire asked if the data support more schools offering such a program. Getting FAA approval is a nightmare of a process and the investment is significant. For-profit schools charge 40% more for tuition than not-for-profit or government-supported schools, which can absorb a loss by making up the funds elsewhere. The answer is not always to build new schools but rather determine whether existing schools are scalable.

Mr. Phillips said to start a small school with about 100 students the upfront cost would be at least $1 million and the program will run in the red for two to three years.

Mr. Flynn said it sounds more efficient to ramp up/scale up existing schools than to start new ones.

Ms. Yale said that new schools may not be the answer and asked whether more partnerships with high schools and post-secondary programs would be more feasible.

Mr. Phillips said that due to no legal changes in 50 years, that schools such as his aren't required to teach composites. This new technology isn't being addressed since the rules haven't changed. His company has been working for more than a decade to get this changed, but it requires a vote in Congress. Another potential change would be to allow online education to count (due to COVID, it's being allowed at satellite locations in high schools). There is a work-around in certain FSDOs – some will approve, others will not.

Mr. Phillips continued and addressed what skills will be needed by future employers in the aviation industry. Getting into schools earlier and presenting on piloting and aircraft dispatch, which are STEM related would help. Sound character and integrity are vital. An employer cares more about being on time, having integrity and being a team player than it does about having a 4.0 gpa. Some things can be taught; others can't.

Dr. Smith said we need to focus on how we can take aviation-related skills and imbed them in the STEM curriculum. Forces of flight should be covered in physics classes, so it needs to be aligned with the SOLs. Teachers need to have training and understand what this is used for. If it's viewed as a professional development opportunity, teachers will line up to get this because it's new, fresh and relevant. Pilots used pre-op flight planning in geometry class. It's value added to the lesson; teachers want to know more. This wouldn't require action by the Department of Education. Teachers can tie into a lesson and use different resources. Forces of flight becomes a real-life application that's integrated into a particular curriculum. It's just a little bit of creativity blended in with the traditional lesson.

Dr. Smith addressed another barrier – hiring maintainers and pilots. It's difficult to find certified flight instructors because many are already retired and doing other jobs; and the pay is significantly less than what they would make in their careers.

Mr. Dallaire said that was a great point. We saw the struggles of hiring instructors, especially pre-COVID, so the airlines increased pay to attract more students. That made it extremely difficult for the schools to keep up with these higher wages. As to the mechanic instructors, schools aren't looking at

retired mechanics but those close to retirement who have experience. However, they are capping out with the airlines pulling in six-figure salaries and they aren't going to respond to an offer of $50,000 from a school. You have the same thing on the pilot side.

Mr. Dallaire continued that he doesn't necessarily need a certified curriculum but one that teaches the foundational basics. AOPA's curriculum is very foundational. Choose Aerospace will be a general aspect of the FAA curriculum – one that can be taught by an uncertified or non-certified mechanic. Aviation Technician Education Council worked with both the Senate and House to introduce legislation that will change the way the curriculum is designed and taking it out of the FAA's responsibility. There's a lot of resistance on the regulator's side. We can thank the FAA for the aviation safety record, so I respect their desire to keep regulations. We've seen with the 737MAX what happens when you take regulation away from the FAA. While we don't have "shop" classes anymore, there are pieces of aerospace that van be easily added to the K-12 curriculum. If things require CFI and/or certified mechanics K-12 will have a huge burden with wage competition.

Mr. Phillips said that partnering with satellite locations on FAA 147 programs provides about 5 months of the 21 months students need in their certification process. There are high school programs in other states that provide summer opportunities for airframe and powerplant.

Mr. Dallaire said to Ms. Drouet that perhaps she can carry back to her group the idea of allowing students enrolled in these Part 147 programs to be able to test at age 17 instead of the current 18. It would take an act of Congress, but it's an important wish.

Mr. Phillips stated that you can take the pilot's test at 16, then asked why it is not the same for the mechanics.

Mr. Dallaire said there's not much the Commonwealth can do in this regard as the decision rests with the FAA, but perhaps someone could speak with Senators Warner and Kaine to see if they could help on the federal level.

Mr. Phillips said that may high schools have automotive programs where students can learn to tune up cars and such, but the same doesn't exist for aircraft. Things are different at sea-level than at 30,000 feet altitude. It's all about the physics and technology. It's why you can't have a square window at 30,000 feet – if they aren't round, they will fracture and break.

Ms. Yale stated that cyber security made a concerted effort to go out as an industry and make state officials aware of the needs for trained professionals at all levels. Should we be looking at a similar strategy? Getting buy-in at the highest levels of what the aviation industry needs and how education and employers can work together. The cyber security folks has an entire conference now in which they bring in educators and state officials to make them aware of the field, the opportunities and the training programs.

Mr. Flynn said in his previous life that he often worked with school systems to do things and found that going to the highest levels of the Department of Education really helped.

Ms. Wilson said that the DOAV works with the Virginia Association of Science Teachers and coordinates some programs with the Department of Education. DOE helps share information about our programs. DOE is always looking at how things relate to the SOLs. It must connect to an SOL. DOE doesn't want to initiate programs; it wants to take something already developed and promote it.

Mr. Flynn stated that schools need to demonstrate success in teaching things that are in the SOLs. This involves the central administration of the DOE along with the state school board. Getting a program adopted by the central administration would overcome a big impediment.

Ms. Wilson said that DOE doesn't necessarily adopt or approve all programs but they do help out. There are approved lesson plans they have on file and I think there are some for aviation. Unfortunately, they are "kind of hidden. We don't see them very often, but they do exist." We actually helped revised them at one point but we should take a look and see what they have in use. School district superintendents have a lot of input on curriculum for their respective districts.

Mr. Estes addressed the cyber security initiative and said there was a large public investment because they were able to provide job numbers so that a talent pipeline investment could be made. It was part of the economic development package that helped attract Amazon's HQ2. We need to rally understand the problem we're trying to solve and that begins with numbers. We know we need mechanics, but how many for Virginia? Scaling up existing programs rather than starting new ones.

Federal Employee 1 asked if we will be enumerating the different career paths the work group is supposed to address, or will this remain general? All aviation jobs are good and you also need aerospace jobs and support.

Mr. Flynn said pilots and mechanics are obvious, but there are UAS pilots and a tremendous demand for people to work on drones. It also means tremendous demand for people who can deal with the massive amount of data generated by UASs. Flying the drone is easy; what one does with the information generated is the real concern. DOAV has a pilot program for using drones to identify obstructions around airports. We worked with the contractor to ensure we had usable data for the FAA. Unfortunately, the FAA's ability to process the data was not to the level of the contractor, so we had to go back and redo the data so that the FAA could process it.

Ms. Cox stated that the overarching goal for what we're doing is supplying the workforce to businesses already in Virginia but also look at fields of study that could attract new business to the Commonwealth. This might lead to some new ideas about areas of education we might want to pursue.

Mr. Phillips said another area of concern is that his company would train people to become aircraft mechanics but other industries such as wind farms, robotics, HVAC and even Disney World would hire new graduates at higher salaries than were offered in aviation because these people can do just about everything.

Mr. Dallaire stated that this goes beyond pilots and mechanics, but our scope is very broad so let's not forget UAS and other areas. Let's be sure to focus on the skilled aspects of aviation, not necessarily the ramp agents or gate agents. Skilled trades, jobs at Wallops Island are important, too.

Mr. Flynn adjourned the meeting at 12 noon. Next meeting is scheduled for Tuesday, Oct. 27, from 10:30 a.m. to 12 noon Eastern time on Zoom.

SJ30 Work Group
Notes from Meeting #2
Oct. 27, 2020

Chairman Mark Flynn called the meeting to order at 10:30 a.m. Eastern time.

In attendance: Mark Flynn, Vicki Cox, Susan Yale, Kevin Dallaire, LaVern Phillips, Dr. Aaron Smith, Bob Hepp, Todd Estes, Bud Oakey, Travis Williams, Tariq Rashid, Dr. David Eshelman, John Campbell, Betty Wilson, Federal Employee 1, Federal Employee 2

Mr. Flynn: I know everybody got an email from John about the Boeing outlook. I wanted to just go over that very briefly. It was really encouraging and it was really consistent with what you all had advised us at the last meeting about what's going on in the industry.

I would have been really worried about the industry being sort of dead in its tracks. And you know you all talked about retirements and there will be before long and then certainly in the time that K-12 and and the secondary schools would be working on stuff that they'll be needing for a lot of folks. Well, the Boeing report which you all had sent to you shows in North America over the next 20 years the need for over 200,000 new pilots 200,000+ technicians and 169,000 cabin crew members. That's a total of 569,000 new personnel being required in the next 20 years just in North America. You know Canada accounts for some of that. Uh, but we're certainly the bulk of it. So that was that's very encouraging. I was really impressed with it. So we have that. The other thing that I just received it, I think it was yesterday, was the Virginia Economic Development Partnership's quarterly Virginia economic review. This issue focuses on aerospace, aviation, and unmanned systems. We're working on getting you all hard copies of it. I will say that I am one who has always taken economic impact surveys with a certain grain of salt.

But this one, it really is a good survey of what's going on in Virginia, with the resources that are there, and the demands that are there. So I'm going to have some for you. It's really, I thought, really well done. And really valuable.

So I'm gonna start off then by hopefully quickly reviewing what John Campbell and I took from the last meeting. One was the issue of coronavirus. I mentioned earlier that that is a three to five year disruption, but there's a pretty significant offset in the longer term by the retirements. And, of course, as Boeing says, the need for new employees in the entire workforce. You know, being a CEO of an airline right now is going to be a not fun job, but in the timeframe that we're talking about in this group, it's not going to be so much an issue. So then we saw I saw at least three major categories of issues in K through 12. And then the post secondary schools, whether it's tech schools, two-year or four-year institutions an new career paths. The third one of the issues that pervades all of them, of course, and particularly issues in K-12 and Postsecondary is the cost. We'll get into that as one of the issues we touched on. How can we help schools with the costs? How can we help students deal with the costs of getting that education? So we had in the K-12 arena getting into the standards of learning and figuring a way to think more generally by incorporating aviation, aerospace, unmanned systems, which I'm going to just call that aviation for now. OK, this for shorthand, incorporating that into the core programs of K-12 education in Virginia so that there's a way to make people understand, the kids understand the

relevance and importance of helping prepare kids to go into this area, this world as a way to make a living.

So part of that, and David this certainly comes into your areas, is how to let school systems know what's out there? What resources are there? We talked about some of the things that folks are doing. We talked about integrating aviation issues into STEM programs, so, as I said before, integrating them into the Standards of Learning.

The cost? How do we deal with the cost for kids to get the technical education while they're in high school? To get them to begin to work on becoming a pilot? We talked about professional development for teachers. And how to get more professional development for teachers so that teachers understand the relevance and the importance and significance of aviation for their kids? We talked about the coordination of the Part 147 schools, aviation maintenance technician schools, with the high schools and there is some of that going on, right? Obviously Denbigh Academy is the probably one of the shining stars for K-12 Education doing aviation stuff.

So that was in K-12; now for post-secondary. Why don't we talk about other things or develop those issues that are in the K-12 round before we go on to the post-secondary stuff? And we have Dave. We have a fairly relaxed approach here. Anybody who has anything to say just says so.

Ms. Cox: I'm wondering if we could be a little more specific and focus our thoughts – we should not even talk about all K through 12. It might be K to 9. The K-9 discussion is more one of intro teacher packages, teacher training and then the 11th grade is more focused on integrating with the technical training institutes or getting more specific or college prep for aviation-related industries.

Mr. Oakey: Mark, this is Bud, VABA. I would carry that even farther down, because we know all of the studies show that the impressionable years are in that 7th, 8th, 9th grade area or the middle school area. I'd ideally push them into Aaron's program. We have STEM program for all the grades; we almost need to segment it into three groups and understand how the kids do it so we can get them into the post high school era.

Dr. Eshelman: Mark, I'll jump in. Don't know exactly where to start to go back and look at career exploration. You're exactly right. There's an emphasis right now. Actually, students are developing a portfolio beginning in kindergarten. Based on all of their experiences as they as they move forward and how their experience is possibly tied to their interests and their abilities. And as they get to the middle years in Virginia, students are developing an academic career plan along with a portfolio to help in the development of that academic career plan. Students in high school, in many cases, continue to explore opportunities. Many students continue to take electives, not exactly knowing what they want to do and even earn dual enrollment college credit while they're in the process of exploring; and some students will go through high school and still exactly not know what they want to do, which is fine.

They're taking advantage of career exploration opportunities. That's the important piece that students continue to apply the content. Knowledge in, as you mentioned, course subjects in elective areas in creative ways, and I'll give you an example. In the Hampton area, they redesigned their entire school system around career pathways. Students are actually selecting a career pathway in all of their electives. Well, I should say all of their core content is relating to the elective areas in the pathways that they identified and connected with. They went with a Ford model next generation learning.

And it's been a multi-year process, but it's one that has been extremely successful in how they're redesigning high schools around this idea of career exploration. When I started my introduction, I said that this is an exciting time, and I see Todd is on the call with the Virginia Community College System. We've been working together, and if you're not aware of our federal funds that support career and technical education, Perkins five was reauthorized a year ago, and it's been over 12 years since that federal grant has been reauthorized. So this state developed a four-year plan. We had a transition year in the first year, which every state in the country did. They went with a one-year transition plan as states developed their four-year plan.

So we have a four-year plan and, for the first time in that plan, the governor and our state superintendent moved to add a reserve fund. And we are in the process of establishing work-based learning coordinators regionally throughout the Commonwealth.

And it's going to be phased in based on funding. We didn't want to do this where it would have a negative impact on community colleges or K through 12 schools, so we're phasing in this reserve fund and we're starting with three positions around the Commonwealth. And we're hopeful to expand to six and then, in the third year, we'll have one in each of the eight superintendent regions that will be focused on working with businesses and industry to align programs to the labor market needs of the Commonwealth and beyond. So this has never happened before in Virginia, where we've pulled that money off the top to do something like this. It is something that must support secondary and post-secondary. So I don't want you to think that these individuals will just be working with K through 12 schools. They must support secondary and post-secondary, so Todd and I are actually working together. We're developing the job description for those positions. We're hopeful to get those positions posted as soon as possible this year, so we're not, you know, going to take this out any further. We want to immediately get these individuals involved. And why am I saying this? I'm saying this because where we've seen success throughout the Commonwealth, and I'm guessing Todd would say the same thing, is at the Community College level.

It's not where school divisions worked independently. It's where we've been collaborative and worked closely with business and industry. Those partnerships have really created some unique career experiences for students before they graduate from high school and, in Todd's case, before they finish a post-graduate program.

We can't do this alone, so looking at what you're trying to do, school systems are looking for partners, and that's been the challenge. As you could imagine in a school division. You could be the science director, but, in a small division, you may also be the assistant superintendent for instruction for that school division so you have limited time to get out into the community to really network with business and industry. So we're really excited to be able to have some people focus their attention on bringing these individuals, these partners and school division players together to build out those pathways. It's been a challenge for school divisions to be able to do that. So understanding the labor market needs and the information that you shared is extremely important. We work with the Weldon Cooper Center at University of Virginia for any school division that wants to build out a new program. You mentioned aviation maintenance technician. If a school division wanted to move in that direction to build that out, you do have to prove and show the labor market data in your application for to the state department to be able to add that new program where we're just not in a position anymore where school divisions can just add something for the sake of adding something. Because there may be a particular teacher there

that promotes something or you know a community that supports something. It really does need to connect to the labor market data.

Mr. Oakey: Can I ask?

Dr. Eshelman: Interject something, Mark, but right go right ahead. I just wanted to kind of give you that background with some of the things that we're focusing on when you're talking about career pathway development.

Mr. Oakey: One of our concerns at Virginia Aviation Business Association is we've got a wonderful network in Virginia in federal policy and state policy. Grab it into our Community College System, Department of Education, and ship based on workforce need and demand. We have a problem in the aviation industry, whether it's dealing with manned or unmanned or space in that we have very, very competitive environments for workforce needs. What happens is industry goes to where the workers are. For example, in a maintenance repair operation which we have wonderful facilities, we are geographically located well in the United States, but we do not have the ability today to meet the workforce demand. If somebody were just interested directly. So what they do is they look for those states that are focused on tomorrow's need, not today's need that are building towards it. I had this discussion with NBAA and Signature Flight Services. A lot of these MROs that are going after and I think we heard from him last aviation conference that we had live. These states have aggressively gone out to build a workforce in this area, sort of like Doctor Smith is doing down in Denbigh.

But we cannot meet that workforce demand in Virginia because we don't necessarily have the graph because the Labor Statistics don't show the demand today. And so, from the industry standpoint, we're sitting there saying in Virginia, we have all of the elements except this one component. It only takes about five years to build it. If we get a 9th grader, we potentially have an A&P mechanic in five or six years. If we get a 9th grader, within 10 years, we have an engineer and potentially a Master's degree-level engineer. For most of us on this call, that's a short period of time to build a ready workforce. But we do know if we have a ready enabled workforce that it will come to us because we're seeing it in another state. We're seeing it in Kentucky and in North Carolina. We're seeing it in Maine. Believe it or not, but they actually attract in into Europe. Uh, so how do we and I think part of this dialogue should go? How do we look and try to adapt, not change, but adapt part or be agile enough to where we can help some of these school systems get out in front of the curve?

Dr. Eshelman: Yeah, oh, but thank you for sharing that. If I could, Mark, respond, I'm going to give you an example. I was fortunate enough with several of my staff to go to an industry partner in an area near Petersburg, and it's the Center for Advanced Manufacturing. I'm just going to use that industry as an example. They have a need to fill advanced manufacturing people and what they did is they created an event. And they brought all the school divisions in that region, and all of the businesses large and small, that have that need and many of those many of those businesses wanted to partner with school divisions. But they had no idea how to start. They didn't know what to do, so they created this event and they brought these people together and what they did is they took our state data. Right now we have 12 forms for example of work-based learning that's approved by the State Board of Education. Some of those are apprenticeships, internships, externships. You know job shadowing experiences all at different levels, and what they did is they took four that they thought really aligned with advanced manufacturing and they created their own cheat sheet explaining those four and the benefit for their business and what they need to do to actually implement one of those opportunities.

And then with having the school divisions there, they basically turned it into an educational opportunity explaining the importance of those work-based learning experiences and how they benefit the school division, but also benefit the business and industry. Because there is an expectation just to give you this in your hip pocket. Um, starting with this year's juniors, Virginia is moving in a direction for each high school will have a performance indicator, and it's going to be a college career and Civic Readiness Index indicator, if you will. Basically, the high school will have this indicator score and one of the opportunities to get a plus point in the numerator of that calculation is to provide not only a sequence earning a credential. That would be one way. Another way would be to experience a work-based learning opportunity. So I'm sharing that with you so that you understand there's definitely an interest in any school division wanting to connect with its community and business partners. They really need to do this in a number of different ways. So to answer your question, it may be a great way to start in a certain region of the Commonwealth where maybe you already know that there is some interest from school divisions or business partners and develop an event like that to really educate. You know all businesses in that industry sector of the importance of engaging in work-based learning.

Mr. Estes: If I could chime into real quick, Bud, you bring up a really, really important point. And it's a very typical tension between workforce development and economic development. But what you said is absolutely reality. How do you prepare job options of the future when you have to prove that the jobs exist today because there's a tension there, right? And so that's something that we deal with a lot in these discussions. Now, that said, both are reality. Absolutely you need to be able to ramp up quickly to attract businesses, right? But you also need to be able to employ your graduates that you produced today. And, so, how do you go about that?

We talked a little bit last week, and I think a big key to that is getting your economic development partners involved in discussion as programs are built. So I'll go back to the VEDP project, right? So at the core of the VEDP proposal to Amazon Web Services in Northern Virginia was writing up degrees in computer science. Basically that's what they did for VEDP. They were to get the collective this system degree to produce a defined number of degrees within the next 20 years, and that won Amazon Web Services in Northern Virginia. So now that one what they did that they were able to commit to scaling existing programs, so that may be a strategy that you could use for aviation. Right now the Boeing report talked about North American demand, but really we're talking about state-level demand. I mean, you're talking about the math when you talk about public educators. So that level demand may not be huge. Or maybe you guys will have to tell us that if it is not at a point right now, but in the next 10 or five years and with the economic development you expect it to be what we need to get our arms around with at the education post-secondary level is where we are today and be able to scale quickly to meet that demand and bring our economic development partners into conversation? You really have to address both. You have to address current demand and where you are headed in order to get a feeling.

Mr. Phillips: So this is LaVern with AIM. To pick up on what David said earlier, we would like to extend an invite to anybody that is not familiar with aircraft maintenance technician training. We have a campus in Manassas. We have a campus in Norfolk. We invite anyone that would like to come. We can arrange a group or we can do individual tours so that you can see the processes that take place. One thing, too, is you have to accommodate your customer – the student. A lot of these students work day jobs, so they're not available for some school programs because they can only go at night time. And there's not but four schools in Virginia that offer this program. There's Liberty, there's Blue Ridge and our two AIM schools. OK, so if that is something of interest, I'm happy to coordinate that. The school in

Norfolk has a little over 200 students. I think the one in Manassas is about the same size, but the complex is smaller.

Dr. Eshelman: LaVern, can it be a virtual tour?

Mr. Phillips: We could probably do that through our marketing/advertising folks. I'll see if we can set that up.

Mr. Oakey: Yeah, LaVern brings it up. You know pretty much any child or adult that goes through AIM or Blue Ridge or Liberty is employable. From our standpoint, we want to make sure they are employed in Virginia. And it's one of the things and if we can take baby steps and just develop a path, then we're a lot farther along today with economic development than we were three years ago or four years ago, and I think all of us would agree with that.

But, if we can start changing; if we can get 5 percent of community colleges thinking to adapt to and what I just go to, it's the workforce that is needed. But not needed in Virginia; not needed in Blackstone today. We're not needed in Mecklenburg County today. But we have the ability to if we can get a prepared workforce. To draw businesses to those areas, we know it if we start developing and driving more of these young people into LaVern's program, Liberty's program, Blue Ridge's program because they're excellent programs and the competition is for those people.

I mean, and LaVern, you correct me if I'm wrong. But the King's Dominion and Busch Gardens, and Six Flags and Disney all want your people just as much as the aviation industry does. Because they need the same skills. Yep, the difference there is in aviation you gotta sign your life away on that aircraft safety and you don't want that ride at Kings Dominion.

And the true partnership is between industry and academia. It all three levels. And I'm dying for Aaron Smith to chime in here. Yeah, because he and I have this discussion all of the time.

Dr. Smith: So when Bud and I've had these conversations the things that come to my mind number one is, in the academic world, they don't always see the power and the dynamics that the aviation profession can bring to an industry to workforce development to the tax base and everything. The second thing is when you recruit, people want to look at a couple of things. They want to hear not only salaries, but, as a parent, they want to hear what kind of skills in particular are they getting within the aviation industry and outside of the aviation industry. Then they want to see what kind of experiences that they can tie into.

And drawing on my experiences as a math teacher, one of the things that I did a poor job with was I didn't tie enough real life experiences in knowing what I know now at aviation. The more we can saturate our teachers' understanding of aviation examples into math, into physics, even English, the more it's going to be retained in this area. It's so important now more than ever, that the competences that CTE is understood by the parents that drop the skills for tomorrow. And that's kind of where you focus at the careers and the skills combined with the knowledge that the academic world can share with the parents in the community.

Dr. Eshelman: Yeah, Aaron, that's a great point. Going back to the area of advanced manufacturing, the company that I work with actually brought parents into the facility, educated the parents and then that school division turned around and used the parents in the recruiting. So it was parents hearing from

parents – very powerful. When you actually get into the facilities and you're hearing directly from parents that had students participate. Yeah, I just wanted to go back on a couple of things. One, when school divisions are developing new programs, they are looking at the labor market data of current, but they're also looking at future trends. So the data that we do pull from the Weldon Cooper Center does go out identifying future trends. You do need to be thinking in those terms. I just look at, for example, Virginia Tech years ago when they started their green engineering program. The jobs weren't there. I had a friend that his daughter went to the program, graduated and even at that point the jobs weren't there. But they are there. They were projecting, so I think that's an important piece where a school division isn't going to just look at the current needs. They do need to be looking at the future needs, and I'll tell you why – because it's very hard to turn programs around with equipment and the necessary professional development for staff. So you're not going to just look at something for right now. You do need to be looking at your existing programs. How do those existing programs evolve based on the future needs of that industry?

Mr. Oakey: Yeah, David. Are those programs, when they're looking at future needs, are they sitting there saying we have this demand on a global basis or in Virginia? I'm oversimplifying, but Virginia for the time being, is not doing anything to attract that. But if we had these elements in place, then we would be attracted to this type of industry. Is it going at it from that angle?

Dr. Eshelman: Yeah, it's interesting. School divisions have a priority focus and that is to support their community in their local community colleges. So that's why you're seeing secondary and post-secondary work together in the development of these pathways because we should be developing something where their student couldn't continue that pathway with their local Community College. So they are looking at that local data. But they're also preparing students for jobs throughout the Commonwealth and throughout the country, where they are needed. It isn't just a local decision.

Mr. Phillips: If I may, Kevin and Bud can add to this, but currently today we tell the students that when you graduate and you have your license, you have to be willing to support the industry. The industry, when Kevin comes in, he doesn't have all of his jobs in Virginia. He has jobs around the USA -- typically where the aircraft hub, the MRO, that's where the jobs are, say Charleston, right now. They just moved from Seattle all the 787 manufacturing. They're getting ready to blossom out. And, uh, they currently come to three of our schools in that triangle to find employees to come to work. Airbus down in Mobile area – same thing. So, for Virginia, if you want to train up the Virginia population for aviation jobs, we have to have the aviation sector there to create those jobs.

Dr. Eshelman: I think that's it.

Dr. Smith: That that ties in with something that that David brought up moments ago – the future jobs. When you talk about schools, schools are not necessarily going to know what those future jobs are, what those future trends are unless somebody actually takes the time and invest in learning about it. So what industry could help schools with is not only telling them about the current needs, but also the projected jobs that are coming down the pipeline in 10 years. Get that saturated in the school system so that it's there and in the career days so that the parents are able to see what's coming down the pipeline the next 5 to 10 years. That's going to really spark kids' excitement and enthusiasm when they see this living, breathing thing that's on a simulator that's been brought in.

Mr. Oakey: At hearing that, I agree with that, but that's hard to do in this industry, and it's hard to do for a number of reasons. One is we're fragmented in this industry. If you go to Danville and look at Goodyear Tire and Rubber, is it an aviation industry or a tire manufacturer? If you go to Fredericksburg and you look at Zenith Aviation is it an electronics company or is it a manufacturer of avionics? We've got many examples of that in this industry where you have the support categories that come in just in support of aviation, but they're not even close to the next code as aviation, electronics, or manufacturing that are out there. They're designing engineering, but they're not aviation. So that's the first problem. The second problem with it is, as we're seeing in the trends In North Carolina, especially in the Greensboro area, is dealing with this right now is driving hard and they've made the investment to grab hard in training, but they are still only getting a small piece. We can look at the Boeing study and there's some PW Cap study out there and there are other studies out there that show these economic trends on a global basis.

But, as a policy standpoint, which is what we're talking about. That's actually what drives David and Todd and their funding. From a policy standpoint, we need to start driving. What are these things that are based on our geography? In Virginia, if we do certain things, it will come and we can grade against, and that comes back to what is our piece of the pie that we want to get there. Kentucky's done that. How many of us will know what Kentucky brags on all the time? Maybe that's because he's in far Southwest, but Kentucky's number 2 export is aviation-related products. And most people don't know that, but they made a conscious effort as the Commonwealth of Kentucky to say we're going after and we're providing focus on that. So it again it comes down to how do we from a policy standpoint? Give the Department of Education and give Virginia Community College Systems, the Superintendent of Public Instruction the ability to support it, your level, and then the high school level with these STEM programs. We've got the greatest STEM programs in the world available to us. But it's still hard to get him in there in this particular area.

Mr. Flynn: It's possible, yeah, if I could say what I'm hearing from this and give it back to you. I think somebody like one of us needs to be the coordinator for putting those kinds of industries together. You know the UAS industry is a huge one that's growing like crazy.

Mr. Oakey: UAS is a good example, but you ask manned aviation and space at this level – the basics are all the same. And we've got to get these kids interested and that's the biggest thing that we all we know. We gotta get them interested to feed the pipeline just to go to the next level.

Ms. Yale: I agree. Can I just jump in for a second? Because what I think I'm hearing, Mark, you're absolutely right. And then David and LaVern also brought this up. What we may need to do is create this virtual event or create an event that brings awareness and brings partners together. Make the school districts aware of the industry and what careers are out there.

Dr. Eshelman: I agree Susan. I wanted to share a couple of things as I was listening to everybody speak. I'm really excited about data, crazy enough. And where we're going right now in Virginia is more data dashboards. And we're in procurement, so I can't really get into the exact process of where we're going. But being visual with where the needs are and the future needs in a visual map and where the programs are in a visual map and how they align is something that we're working on currently. I wanted to also talk about policy but really hit on a huge piece. I'm going to give you some background the National Governors' Association 40 years ago developed a project through their policy program and they engaged that started with six states and it's now gone through phase two. There are 19 states that have been

associated with expanding work-based learning opportunities because the Governors' Association understands the economic impact for states. If there is that investment you mentioned for North Carolina last year, the governor put in his budget $10,000,000, and it was approved. And it went into the Commerce Department, and they turned around many grants for business and industry to help build out virtual work-based learning opportunities. So an example in the STEM area they call it STEM East Connector in North Carolina and several regions in the eastern part of North Carolina developed. They took that funding and they developed some virtual work based learning opportunities to align with the workforce needs in that area. So I can't lobby the General Assembly, but there is that need if you're looking at the policy side of things, that is a direction to go because money is needed to desperately build out virtual work-based learning experiences. It's not an end result of the impact of COVID-19, but at providing equity across the Commonwealth. I'll just use NASA, for example, in Hampton. If they develop an internship, what about a student in Lee County in Southwest Virginia? We have to make sure that we're providing work-based learning opportunities, not based on someone's zip code but on the resources that we can develop to tear down those boundaries. So, where I'm going with this is, wouldn't it be great if the aviation industry invested in help building out virtual work-based learning experiences so that students all over the Commonwealth could benefit and not just where there may be industry? And in this particular case industry outside of Virginia, you know, so we're even thinking big and thinking about how we can partner with surrounding states. For example, because some of those work-based learning experiences in Virginia are actually in other states. When you look at, you know, the border areas around the Commonwealth.

Mr. Estes: May I jump in and make this one quick comment then I'll be quiet? I'm talking from a state policy perspective. I think, Bud and Mark, you both hit on it. How do you move policy when you have an industry that is maybe not well defined or identified when you talk about the different employers that have pieces of the aviation pipeline, but they're not even defined as aviation pipeline? I think you hit on it already. If you can get a collective voice, there's nothing that CTE in post-secondary level respond to more than the employer voice, and so the key is figuring out how to get that important voice together in speaking? It didn't have to be in unison, but at least it is engaged at the system level. These are needs. This is what we see. Our future needs to go back to that economic development chicken or egg conversation and start having that conversation. It's very difficult to at the state or system level when you have these fragmented, independent conversations going on so there's something this group can do through trade associations, through agencies to help get that voice into one. Then you can get engaged with postsecondary system level and Dave Eshleman in K-12 at the system level. Then you can start making progress in planning for that future, right?

Dr. Eshelman: Todd, just to add to what you said, that is perfect and I'll use it. Use the example of the energy sector. You know that an industry that that lobbied, and funding came forward, and now Virginia has adopted the 17th career cluster in energy. So there's a national model that Virginia's been using for years in 16 career clusters – transportation is one where you would fall with aviation. But there's an example of an industry sector lobbying and getting the support to identify the need to establish a 17th career cluster. So Virginia is one of six states that has now an energy cluster. So that's a perfect example of pods at point.

Mr. Phillips: I gotta comment on what David said, too. We are currently in Orlando, and in Charlotte due to economic development. They courted us. They had to have a workforce in order to draw the business to them. And so they got us to agree to come and open the school in their locality in order to win contracts and bring the business to their state. Same thing in Illinois. We are in the process right now of opening a new school, and as soon as the support of AR, which is a MRO, and United Airlines, they have trouble getting people to relocate certain areas and that's one; San Francisco is another. Do they have trouble getting staff to work?

Mr. Oakey: Well, Mark, just going along with what everybody else just said. LaVern kinda hit it better. From where I'm coming at is the state's aggressiveness in coming after him to meet the workforce, demand to attract the industry. I think the fact that we're talking about it and I do have a little knowledge on lobbying here in developing the policy side. The economic development study and the SJ 30. I think it's safe to say that what we should probably have in this study is it coming out and saying this is a hole in our policy framework. It's not. It's not the end all be all, but it's one piece of the pie and this is a hole that the Legislature needs to focus on. And the Governor's office needs to focus on filling so that we can help take this pipeline forward.

Mr. Flynn: Since we do have a representative from the Office of the State Coordinator for Workforce Development, Megan Healy, on this Work Group, that's the place that we ought to work with very much. They've been unable to attend these first two meeting calls, but I'll talk with Megan.

Mr. Oakey: Well, in my discussions with Megan, Mark, she understands it, and she's certainly been thinking about it more. She keeps on coming up against the hit from a policy standpoint that we do have demonstrated demands in industry in Virginia, based on existing industry. But this is not under her purview with regard to existing demand, and she's having a hard time marrying those two pieces. And I think that's where we have to make a stand.

Mr. Flynn: What we have now is a new response. This thing that I held up before – the Virginia Economic Development Review. I mean, this shows what's going on, and it's cool because it shows not only traditional aviation, it shows aerospace and UAS. So you know an assorted collection of sister agencies are also saying, "Yeah, it's there."

Mr. Dallaire: Just to echo from the industry perspective, so Piedmont Airlines when we opened a new facility in Richmond four years ago, we looked at the area. Richmond International had a hanger for us, but we looked at the workforce development in the area. Where were we going to pull people from? That was a tough one for us. The closest schools were Manassas and in Norfolk. Liberty's program was like 2 1/2 hours away. That was a tough sell for us two years ago. We opened a new facility in Albany, NY. We went there, and we're like, OK, you got a great hangar, but how are we going to sustain a workforce? How are we going to get employees? First off, what is your workforce look like currently? How can we possibly steal them from other people? But what are we going to do to have sustained employees? Realistically, our attrition is high as regional airline. New mechanics come to work for us and then they go to work for the main airlines or other industries. So we needed a sustainable workforce in the future. That was a hard sell for us in Richmond and in other places. So, you can tout, hey, we've got a hangar, but without schools in good locations or areas, I mean one of the things we're talking about right now is K through 12, right, bringing awareness? Even looking at the Richmond area, in the Richmond area, nobody knows about aviation. The schools. It was a struggle. We've partnered with some of the local schools to come in there and sell aviation, but there just wasn't that interest.

Mr. Flynn: Well, Kevin, you just put yourself to work with the Department of Aviation. I know because we do the outreach things with this, with particularly underserved community schools and having you partner with us in this endeavor, that would be really fantastic. You know, I think we talked about it that we have bought an icon A5, which is a cool looking little airplane and the kids can actually get in the thing and you know move the stick and see the ailerons and rudder and all this stuff move. Plus flight simulators, and we do a lot of related stuff, so we'll be talking.

Mr. Dallaire: Sounds good.

Ms. Cox: I have a quick question. Let's see linkage out there between the workforce development effort in the Commonwealth and the VEDP, the economic development effort. Is there a close tie in there? Because it seems like there should be it. One is of vital importance to the other.

Mr. Estes: I will tell you one piece and David, I'm not sure you know, but VEDP stood up a new training arm in an accelerator training capacity within the last year or so and that is done in partnership with the Virginia Community College System. And so what? What that is designed to do is in the process of their economic development conversations with new employers, they can offer employers some rapid training to meet workforce demand immediately when that company comes in, and then that training program is handed over to the Community College System for long-term sustainability. So that is a relatively new program that was stood up through VEDP that is in partnership with the Community College System.

Mr. Oakey: You know, Vicky, I will get from industry standpoint. I would say the VEDP in the last three years has done a good job of looking at the aviation and aerospace community differently. They have also applied some resources. But they're like every other agency of state government. They're spread thin. And you know from the private sector it's all of a sudden they get into what is the priority I have to spend the most time on today? We've got four or five companies. If you look at Dynamic Aviation, if we look at Piedmont, if you look at Leidos, if you look at some of the other things that are going on that are having these demands, but it's still not demonstrating enough to people who want to change from traditional bricks and mortar areas, so these agencies, and I'll go at it from my standpoint, it's not intended as anything other than process – the agencies function based on budget and policy. And so they need some support from up top. Coming down, it says this is part of where we want to focus and then they have to have some funding to do that so that they can properly resource it. And then from our standpoint, our Department of Education, especially the Superintendent of Public Instruction and the Community College System. What's going on at Blue Ridge needs to be replicated everywhere, uh, in our mind, but it's a build that we will come and they're not on that build it. We will come model from a policy standpoint, which makes it difficult. I think the interesting issue on the workforce issue in all of this does tap together as David pointed out, having a point person, but there also and I think from my standpoint, of course, having sat in your seat, I sit there and think the Department of Aviation should be the center point of all things in this area. But we need to have a greater focus on what this workforce demand truly means? UAS is the perfect example.

The aircraft is a small piece of the total solution. It's the aircraft plus the technology that goes with the aircraft are on the aircraft, and that's whether it's manned or unmanned. That's whether it goes to the moon or not. We've got to have these components together and the workforce component under Megan's group is the perfect place for that, but even policy-wise it's not structured to do that.

Mr. Estes: And Bud, I'll have to agree with everything you're saying. If you start off by saying look the VEDPs and to be quite honest, BCCS, is in the world you have. You have your defined priorities and your funding chases your priorities right? And so you're competing with cyber security, Healthcare and the shipbuilding industry in Hampton Roads. There are lots of priority areas. So you have to have these aviation entities get their voice heard in the midst of all of that.

The governor, this administration, anyway, right Megan in this governor has defined his priority sectors and those priority sectors are manufacturing and, ultimately, skilled trades. Now that aviation is not in that language, but certainly aviation technicians are part of the manufacturing or skilled trades area and so gain your voice within those other priority areas.

Dr. Eshelman: For the past three years, we've been running a statewide conference at the secondary level, and it is called Experience Works, and it's a summer conference for school divisions all over the Commonwealth. They bring staff there and we talk about everything related to workforce development and work-based learning, so it's a focus on that. It is scheduled right now. The proposed dates are June 16th and 17th, and it will be this year a virtual experience. Now the benefit of something like this. We have been bringing school division to the Richmond area and then part of it is they actually have the teachers and the staff get out into business and industry. They need to hear directly from business and industry, so they would put together these virtual tours. So, if you can pull those resources together, we would love to have you not only provide a virtual tour for June 16th and 17th, but even a possible breakout session. Educating educators about this industry sector and the importance and the need for this. This would be a great opportunity and vehicle to do that. And it's June 16th and 17th are currently our proposed dates. As you can imagine you know trying to lock this in, we just decided to go with it virtual rather than bring people to the Richmond area.

Mr. Phillips: Yeah, David, if I may, the FAA previously – this is a couple of years back and I think it's still on the website – tried to promote the career opportunities. They did a video and I can share that. I've got it linked to it, but they filmed the aircraft maintenance training part in our school in Atlanta so you can see the students working on engines and airplanes and running engines, but they also were in Bombardier. They were in, I think, Gulfstream and a few others. Very good video. They showed aircraft in flight, etc., prepping. If you're going to a virtual format, it can't be just aircraft maintenance training school. It's gotta be the employers you're going to have to get. NBAA, Bud and his group, and Mark and others pull people together to do a virtual combination.

Dr. Eshelman: Yeah, definitely, and you can imagine if you're trying to connect with school divisions and they don't have the business partners locally, we need to find a way to blur the lines if you will and make sure that you know they have access to information. I know I keep stressing that, but it is a challenge for school divisions when the partners aren't right there. It makes it very easy when you have local partners. The example I gave you with the regions in a certain area with advanced manufacturing they were all there and they brought that event and they brought people together – that's easier than in some cases. You know where these these resources, the partnerships aren't in their own backyard, we gotta find ways to make those connections in other ways.

Mr. Oakey: I think between myself and John Campbell's division within the DOAV, we can help you facilitate and pull together business and industry in a very 3 dimensional way. If we can get these kids out of high school and they want to work, they will have a job. And it's not a question of the only interest is are they willing to work and do they want the job? In many cases, it's are they willing to move? But if we're producing enough children, those jobs will come to Virginia quicker than any place else 'cause that's what industry is looking at. Kevin just told you, but you got the same story. I can put 10 A&P mechanics in Dynamic Aviation today, and I would dare say at Leidos, too. And then they're gonna want 10 more tomorrow. And I'm watching LaVern nod his head. You know, every single business that we have is looking for these skill sets. And they're not all college degrees. Although we need these, we need these college degree engineers, but we also need electronics. We also need metal forming. We also need hydraulics.

Dr. Eshelman: Yeah.

Mr. Phillips: I often tell new applicants or when I speak to an orientation or something that what matters most to Kevin is you had that FAA certificate with a rating and airframe and power plant preferred but also single-rated programs. We get veterans to come out of the military. There, a metalsmith never worked on an engine. They can get their airframe rating and get hired very quickly with that one single rating. Doesn't mean they can't add a rating at a later date, but it gets him or her in the door. I have a nephew that was involved with B-2 bombers in Air Force for years. He's now working for Boeing up in San Antonio. He doesn't have any engine rating. But he's making pretty good salary with Boeing in San Antonio right now, and he doesn't have a degree. He can get that later. That comes into management. That's when it's really important there. But to get your feet in the door and learn and grow, you have to have a license.

Mr. Flynn: Well, I think we have a way forward on this area; I have some really good ideas. I think we can try to pull those together and will send out notes on that issue. Of course that also involves cost. Cost for the students; costs for the school systems; costs for everybody involved. How do we address that? How do we address those cost issues?

Mr. Phillips: Let me say something on cost. We have two different categories in there. We had the public school nonprofit works pretty much like the public schools and then the for-profit. Of course, AIM is for- profit. The biggest 10 colleges out there. Training aircraft means technicians or for profit. One of the things there is the public universities are given money. They write grants. They're given things (donations). Our cost is higher, but we're not given anything. If I want to open a school. I've got to have about a million and a half dollars to even think about opening a school. There's no grant writing. If I need an airplane, I gotta buy it. Can't make a donation to a for-profit. Well, they can give it, but they can't get a tax advantage. So I mean, there's restrictions. But you know why are we higher than Liberty? Well, not Liberty, but Blue Ridge? Blue Ridge is a fine example. They're probably in $20,000 range. We're closer to $50,000, but we did not focus on degrees. We're focused on getting you in, getting your license, and getting a job. We're connected with industry. So that is part of what we promote – we have the relationships with the employers. Kevin is one of many to come in our schools and interview students right in the school building before they even graduate. And any offers made are contingent on finishing the program, getting your license and being willing to relocate to where the job is. So the students have to decide, do I want to stay in this locality? That may limit my income earning opportunity. No, it's not that there's not a job in Virginia or in Richmond or certain areas, but they might

be offered more money to go to a less desired area like San Francisco. They have to pay out a lot of money to get people to move to San Francisco for United Airlines.

Mr. Oakey: Mark, but let me come at it from a different angle than LaVern did. Because I think where you're going is how do we pay from this from the state level, whether it's through the community colleges, the Superintendent of Public Instruction within the Department of Education. Where does this money flow from.

The next step is going to be, what does that plan look like? If that includes a more coordinated effort as a recommendation, is that with at least one dedicated staff person to help organize that? Among the Department of Education, VCCS, Superintendent of Public Instruction, Department of Aviation, various stakeholders, localities, etc., we should come up with that. That's going to define overall budgeting, and I don't think it's a lot because as you recall from past GAAC meetings, you know the question is: What's industry's share?

Whether it is, as LaVern says, they get their A&P certification. But then, all of a sudden, they're at Boeing or they're at Leidos, at Dynamic. The company wants them to get a bachelor's degree to go to the next level. So there's a lot of shared expenses that will go on if we can just kick start this, But if we look at this, SJ30 will evolve into a more coordinated approach that will come with baby steps and we're going to have to sit down with Chairman Torian, and we're going to have to sit down with Vice Chairman Sickles – he's senior on the GAAC – and come up with these recommendations and then you know my organization. You will have to come in. We're going to have to get La Verne and Kevin and Bob and everybody from their respective sides of this to come in and talk about the need. And we can coordinate that. But, you know, we're not going to have that answer: What this is going to cost with this SJ 30 study.

Mr. Flynn: And, of course, one of the areas we've talked about it some, but one of the areas that is really growing is UAS. Tariq, I know you're up to your eyeballs in what's going on. Are you finding a challenge getting enough workforce, or how's that going for your world?

Mr. Rashid: Yeah, that's an interesting question. So what and where are Wing positions? I've worked for three different commercial drone companies since I left the Navy and they stretched from like where there's a lot of really hands, intense fieldwork for UAS. And what seemed to work best there was those people who already were kind of domain experts in that industry. Whatever the use case was being trained up to use UAS seemed to be more effective than having people who are pure aviation people go and try to do that. I know those companies have had trouble getting like the aviation culture indoctrinated into their organizations. With respect to where I am with Wing, Wing is kind of on the opposite end where our system is extremely automated. And so what we have is the public man who's almost like a supervisor, decision maker. And our exemption, even though we're considered an air carrier, our exemption actually allows us to use a Part 107 certificate holder as a pilot in command.

As a consequence, we have a wide variety of Part 107, partially because the way we've sourced staff in the US, which we may change, but we get a wide variety of skill sets. We get people who are just Part 107 holders with no prior manned aviation experience, and then we have people with significant amounts of aviation experience, and so we have a challenge. Sometimes in standardizing, you know reaching a safety consciousness that is often kind of native to people who come from a manned aviation background. So we have to kind of bring everybody to that safety standard. And then we have other

roles, which, because our aircraft are so automated or almost so simplified that we don't want to see people get complacent or bored. But you know, you don't need to have an A&P or to have a lot of experience or skills to do some of the stuff we do. And so we have this challenge where we gotta have people who have the safety mindset of manned aviation. But those people also sometimes get bored or not complacent, but they cut the system. They're kind of babysitting the automated system. The challenge is, ohw do you keep those people interested? And how do you develop career path lines for those people? That's something that actually we're on. Just to be honest, we're still kind of struggling with it. Once commercial drone delivery starts to take off in the United States, finding people who have that aviation safety mindset but also are willing to accept not being as hands on as they might want to be is going to be challenging. We've already seen some retention challenges based on that.

Mr. Flynn: Who was putting that together? Do you think that sounds almost like there's a whole new education path? And that is educating people to have the safety concept, but then to have the technical expertise to manage the systems that you all are dealing with. Something very different than a person who comes out of AIM would be thinking about.

Mr. Rashid: Yeah, that's it.

Mr. Flynn: Changed the magnetos on a [drone].

Mr. Rashid: Exactly. I mean it's gonna be interesting. We actually just had a pretty intense conversation yesterday about trying to figure out about trying to shift some of our aircraft manufacturing into the United States. But at the same time, in order for drone, at least the Wing's model of drone deliveries based enabling local merchants. So it's really based on local delivery, direct to residents. In order for that to scale and be economically viable, the cost of supporting aircraft must be really, really low. This may mean that we basically manufacture the aircraft using it once they hit like some really short service lifetime or something breaks, we just discard it or remanufacture it. So trying to figure out how you establish an acceptable maintenance concept? I mean, be acceptable to the FAA, where we don't just follow strictly Part 135, we'd have to have our own maintenance department within the air carrier side, and it's not obvious that that's economically scalable. What we'd like to do is just have the Wing manufacturer in the US somewhere. Just give them the aircraft back and then whatever components of aircraft that can be reused, get remanufactured into a new aircraft and we just take the new aircraft so that requires some some skill sets, but like you said, it's not people changing a magneto. So there's just no way the economics makes sense when we have a lot of touch on aircraft that are in service. It probably makes sense for the aircraft to essentially get remanufactured, which requires some skill set as well.

But that's just Wing. I mean there's going to be 20 other drone delivery companies that have completely different economic models, and some of them, such as Valkyrie, have aircraft that are hundreds of pounds. Those aircraft are probably gonna fall under the exact same or very similar maintenance support requirements that manned aircraft do.

Mr. Phillips: Yeah, this company in California with 1,000 pound payload.

Mr. Rashid: Yeah, but I know by no means is Wing going to be the only drone delivery company.

Mr. Flynn: I mean we have Aurora Flight Systems, and Textron down at Blackstone doing very different stuff.

Mr. Rashid: You know absolutely like the Bell stuff. The APT. Yep, so it's gonna be interesting. I mean, I think there's going to be a lot. I mean, there's a company working with robotic systems and they took a Cessna Caravan and then they made it remotely piloted. So, I think in 10 years you'll see all types anywhere from our 15-pound drone up to 1,000-pound delivery drones.

Mr. Oakey: Well that goes to the point from the teaching standpoint and the technical standpoint. That whatever we're giving these kids today in K through 12, they're going to need to go to the next level because it's not in the drone. You know, look at what NASA is doing at Langley with UAS as well. There's gonna be so many different options. We can't imagine what it's going to really look like in 10 years.

Mr. Estes: Just real quickly to talk about a couple of assets that are already in place that could potentially help in scaling for the UAS as well as the rest of aviation there through the Virginia Space Grant Consortium. Their National Science Foundation 80 Center just got funded again to help professional development in the Community College System around UAS pilot training basically in program so and so. That's a resource that's available that can help us scale, and then there's the Governor's G3 program that offers tuition dollars towards specific workforce programs. Aviation mechatronics programs are included in that, so that will help address your student costs.

Now the capacity building costs is what we have to get our arms around, which I know LaVern highlighted last week. If we were to take Blue Ridge and try to duplicate that in other regions then there are capital investments that have to be made to do that. So the student costs were set up to do pretty well through G3. Just said we would have to get a long-term capital piece for the for the public site.

Mr. Flynn: We need to close this out. Does anybody else have any comments before I do that?

Mr. Phillips: I'm going to check with our marketing/advertising department and maybe with the blessings of the president they would be able to help you develop a virtual session that can be shared.

Mr. Flynn: Good, right? Well, it's been fantastic, and we've certainly scratched the surface anyway. So we're going to send out notes from this and then we will poll to see about another meeting. It sounds to me like we need another meeting. Can I have a show of hands on a reaction to having another meeting like this? Alright. Pretty good consensus, so we'll do that. We will close for today. This has been fantastic. I've learned a terrific amount. Thank you all very much.

SJ30 Work Group

Notes from Meeting #3

Nov. 17, 2020

In attendance: Mark Flynn, Kevin Dallaire, LaVern Phillips, Todd Estes, Bud Oakey, Travis Williams, Felix Schapiro, Tracy Montross, John Campbell, Betty Wilson, Federal Employee 1, Federal Employee 2

Mr. Flynn: So, of course, this is the third meeting and from my perspective they've been really good meetings. You know we're charged with looking at how we improve workforce development in aviation and I'm just going to use the term aviation in the broadest sense. That would in my mind include for this discussion, aerospace and UAS as well as traditional aviation.

During the last meeting on the 27th, we ended up with a discussion boiling down to needing someone or some small group to really coordinate the efforts in workforce development including education about aviation. Aviation Board member Vicki Cox was unable to join us today but she did send us a page of thoughts, which she split into three areas: 1. K-8 to increase awareness and aviation's associated careers; 2. then grades nine through 12 for vocational technical education courses focused on training needed skills in aviation and then in STEM by increasing knowledge linkage between traditional coursework and awareness of aviation; finally, 3. the College/University level, to include all of the important work done there. She had the same reaction that I did in that we believe the answer lies in improved coordination among and across all these ongoing efforts.

It's really struck me that we're down to needing a small working group that would that would push this all forward into the future to ensure aviation/aerospace/UAS are integral parts of the educational system. And, of course, working with the industry folks to ensure we are coordinating all of these efforts and bringing the industry together with education. You know we talked about the internships, apprenticeships, the opportunities to just simply expose kids to what's going on in our industry.

Within this environment, maybe a virtual walkthrough or a virtual day. You know at the factory and how things work in a company. That was my take on this. And I'm not hitting every detail, I know, but I'd like to bounce that off of you to see if that concurs with your impression of where we are. Or if you have other thoughts. So please everybody feel free. And the first one into the water is always the toughest, right?

Mr. Oakey: That was a good review, Mark

Mr. Flynn: Thanks.

Mr. Oakey: And I think the question is maybe, OK, what next?

Mr. Flynn: Yeah, that's what I'm getting at. And my what next to try to prime this pump is probably recommending a small working group. I don't know how formulaic this has to be. You know we are doing a report to the Virginia Legislature but I think, in my mind, this goes well beyond a report. This small working group could include the Department of Aviation, the Department of Education, the Community College System and, perhaps, the Governor's Secretary of Workforce Development. We have Felix Shapiro, and I see Felix's phone iPhone is on. Good morning, Felix.

Mr. Schapiro: Good morning. Great here to be here with you. Interested in learning more about the aviation industry.

Mr. Phillips: Oh yeah, Laverne Phillips. I've joined. I could not connect via the computer.

Mr. Flynn: But soon you know this, I'm sort of saying maybe we ought to be recommending something a bit broader than just a group comprised of government officials. If other people are willing to volunteer for it, this fairly small work group would be open to others willing to serve. But, ultimately, these are, you know, government activities getting into the K-12 system and into the community colleges and the four-year schools.

Mr. Oakey: Mark, I would say that I agree with the small work group. Industry needs to have a position at the table just so that on the academia side they are hearing real time needs and all that we're talking about. Because it's a lot more than theory. It's practicality and industry, and every time we introduce the gap into the legislature, everybody is always asking what's industry's contribution to this. What are industry needs? It's one or two people, large and small facilities from the technical degree to the certificated. That that piece of the pie needs to be at the table.

Mr. Flynn: OK, yeah. Other comments on the industry participation in the small group?

Mr. Phillips: Uh, this is La Vern.

Mr. Dallaire: This is Kevin. Absolutely. Oh, go ahead, LaVern.

Mr. Phillips: OK. What I was gonna say was you know we have two schools, Part 147 schools, in Virginia. One in Manassas, one in Norfolk, VA. As far as facilities, would be happy to work something there for any tours of educators or if they want to see why they might want to partner up or what it is that their students could learn and how they could benefit. And we're also working with Davis High School, their MAG program. It would be an excellent opportunity for them to speak with other high schools and find out, you know, what did they gain out of it and how it helps students in the long run. I would just put that out there.

Mr. Flynn: Yeah. And so, and Kevin, you were going to say?

Mr. Dallaire: Yeah, obviously industry would love to have a seat at the table. I think one of the discussions we ended our last conversation saying that there was we didn't really know who all the players were in the state of Virginia, so I think that's probably a great kind of starting point to figure who are the players and make sure they're all at the table or at least have the opportunity to be at the table.

But, Mark, just quickly, Tracy Montross, my colleague from American Airlines, is our director of state and local affairs for the Mid-Atlantic area. She is listening on the call. So just to give you heads up that she did join.

Ms. Montross: Thanks Kevin. I said hi to Mark before you dialed in and again appreciate the opportunity to listen in on today's conversation. Hi Bud. Hi friends. Nice to see you all.

Federal Employee 1: Something that I'd like to point out, and I'm sorry if I didn't mention this in one of the earlier meetings. I hope most of you are aware of the two task forces that are currently on going that were part of FAA's 2018 reauthorization. There was a Women in Aviation Task Force that kicked off in the summer; and the Youth in Aviation Task Force, which kicked off last month. They have slightly

different charters and slightly different durations, but very good representation from across the country from academia, from industry, and your various professional organizations as well. Both of those tasks task forces would be something that I think would benefit you from following and listening into their meetings. Their meetings are, I believe, quarterly. They are open to the public, and then you can always go on YouTube. I believe the recordings of their sessions are on YouTube as well.

Mr. Flynn: Are those under the auspices of the FAA or are you all managing?

Federal Employee 1: We are supporting them by providing them a forum and providing them the logistics, if you will. We are not directing those efforts. The net result of those efforts will be recommendations to the agency that we hope we can take forward along with impactful changes moving forward.

Mr. Oakey: Mark, I'd like to add a comment on that, but I'd like to come back. We were looking at the small work group. You're also looking separately at the study report. There's two separate activities. Am I correct in that?

Mr. Flynn: Through the report I think would recommend establishment of the small work group, you know, to actually have something happen.

Mr. Oakey: The reason I bring that up is the boots on the ground with you at the legislature. Having been preaching this, feeding the pipeline sermon almost in the K through 12 area, for what now four years? Three years? Tracy, you and Kevin chime in here, and Laverne you, too. The big thing that we have seen is the states that are succeeding – and I think Christina can bear this out as well -- the states that are succeeding with the attraction of aviation industry and growth are the states that are proactively working to make sure young people are coming out of high school interested in aviation-related career sets. Whether it's advanced degrees looking at space; looking at aircraft design; looking at UAS design; or it's being the pilot or the maintainer or some other type of support structure. There's not a lot of talk going on with that. The reason the discussion is so important is there's not a lot of different people telling the legislators that, and when it comes to program we're competing against so many other needs in K through 12 education for funding that the legislature is saying, “Well, nobody's beating our door down.” And then workforce is saying, “Well, we don't see a demand in aviation. We do see a demand electronics. We do see a demand in manufacturing. We don't see a demand in aviation once because our industry is all spread apart. I would reiterate that in this group, that we've got to be collected behind our message. We have to really think as a work group. How do we take that out and educate more broadly? And I'm gonna throw that out there and shut up to see if anybody thinks I'm on base or off base.

Mr. Flynn: Most certainly, you know, from the last discussion, a big and significant part of this work group is to help industry understand the workforce development opportunities that Virginia has and then help the education system broadly understand the industry need for workforce for employees in the future. It's bringing them together. You know. Dave Eshelman talked about what they're doing next June -- the Experience Work summer conference. It's that kind of thing of ours, in this case, our small group bringing that message close to the K-12 and then breaking into industry.

So, yeah, I agree with you. And I think that's what the small work group would be in charge of is just getting the word out to both sides and helping, you know, working in Department of Education to come

up with the programs that school systems can pick up on and use to expose their students to the opportunities. And you know, LaVern, the kind of thing that you suggested about going to AIM, our facilities, and going to Denbigh, you know, that's what this work group can help push forward.

Mr. Dallaire: Bud, I would absolutely agree with what you were saying. Obviously, we've got Tracy to help us navigate resources in Virginia, but she's looking out for the entire American Airlines family. But when it comes to Piedmont specifically, you know we're obviously a smaller organization. And while we've got two facilities, it is difficult at times because of a lack of resources to navigate what is available in those specific states. You know, we can try to start diving in a little bit, but, at times, it is burdensome, so I think that is a great piece of that.

Ms. Montross: Yeah, I will just add that when we look at like Newport News and their Academy, it really takes the leadership of the school there to reach out to you, know the airport and the local leadership to get them to come out and engage. And I think if there is a lot of activity and kind of an attention made by the school leadership to reach out to industry, that makes it easier on us to participate rather than going into programs or into schools and setting up our own program. We are looking for kind of a just an easier way to engage. It is certainly more compelling and just a better use of our time, honestly. And then, when you look longer term, I think, on the in workforce incentives piece, which, you know, I'm sure as a function of what this group is analyzing, part of our challenge will always be that so much of the training that we do in specific markets. Often those employees, because of our Union bid system, will be eligible for positions outside of the state, and so really where we see probably the most competition for both cultivating talent and placing that talent in the state is when you have facilities in the state. And, so for us, you know, where we have markets that have huge pipeline needs or desirable locations to live Chicago, New York, Philadelphia. You could be trained in Virginia, but, unfortunately, the folks who want to work at our stations in Virginia are tenured employees. The ones who have earned their stripes in a less desirable station. So I just wanted to put that out there. I think there's certainly a willingness on our part to engage with local institutions. But it takes kind of the ask on their part to get us there and to make it easy for our team to show up and to make the most of the opportunity and then, separately, just recognizing some of the challenges, particularly Union-organized, industries will have when it comes to the bidding system related to placement.

Mr. Flynn: Well, it goes without saying that Virginia would command the highest bids, of course.

Ms. Montross: Exactly, that's right. You're such a desirable station. You know the Commonwealth is a wonderful place to live, and so we don't have any trouble recruiting people to work at these stations. Yeah.

Federal Employee 1: I appreciate Tracy's comments. We see the exact same thing happening in our air traffic controller workforce, in that the controllers will train for three years at a much smaller facility and then they can't wait to get out of town to better, you know, a larger facility. In the controller workforce, this means more pay as well if it's a busier facility. But it is just, you know, the handful of people that to them, that's home that are the constant in some of these smaller communities with air traffic control facilities.

Ms. Montross: So let's say one apprenticeship, sorry Mark, because I know how as a buzzword, apprenticeships are you know so critical to manufacturing, and I know that our partners on the MRO side. Or are you interested in pursuing those relationships with high school seniors and then those right

fresh out of college? And those again with technical training. But again, for unionized organizations, we really struggle with the apprenticeship program because we don't have that type of language within our collective bargaining agreements, which permits the training of individuals who are not FAA certified to work within the facilities.

So, I just want to keep in mind maybe there's something within this task force report that can kind of spell out some of these challenges associated with our union agreements, and how they can honestly be a bit of a hurdle for some of our states to be more advantageous about recruitment and supporting that pipeline. Just a good level set for folks.

Mr. Flynn: So for Felix and for Todd Estes, how do you all feel about your agencies being involved in this small working group that moves forward? What's your reaction to that?

Mr. Schapiro: I certainly think we'd like to, you know, be participatory and supportive as possible. I will say many of our resources are stretched pretty thin in the workforce development space at the moment dealing with that onslaught of the COVID-19 crisis. So it may be difficult to fully engage on this issue in the short term, but I definitely think the state wants to be a good partner to y'all on this and do what we can to support the aviation industry.

Mr. Flynn: Yeah, and Felix, we had a conversation during our first meeting that if you look at the current situation, the current environment of aviation, there's a amount of doom and gloom, I guess. It was pretty tough. Airline business is not easy now. FBOs are having a tough time. But what really struck me is that what we're talking about here is a longer term than in 2020 or 2021. Beginning in 2022-2023 or 2024, that we're going to be going gangbusters again in the aviation world. We'll be going gangbusters, and particularly, you know, K through 8th grade and then 9th graders -- by the time they're ready to be employees, the coronavirus will be a bad page in our history books. It will change things, perhaps forever, but we won't be in the situation we're in now. So, Felix, this thing about currently being stretched thin, I get that completely, but we very much like to have your workforce development secretary involved for sure.

Todd, what about the Community College System?

Mr. Oakey: Mark, yes, if I could ask a question with both community colleges and Department of Education workforce on the call. You know it's even in spite of COVID-19. We have a workforce demand, and we're finding through the studies we're doing right now that a lot of our maintenance repair operations are actually increasing their workloads and still have strong needs for certified mechanics and electricians and the like. So, I would come back to the Department of Education, BCCS and IT workforce and say, What do we need to do to get the commitment behind you guys to focus more on this effort for the growth of this industry in Virginia? We have a workforce issue and the companies are going to the states that can meet the workforce. Demand in Virginia is not one of 'em.

Mr. Flynn: And so that you know that communication back and forth, I think is a part of it ongoing. If we set up this small work group.

Mr. Schapiro: Yeah, I mean, I will say I think one of the things that's very attractive to us at the state level when sort of determining our workforce strategy is looking at what sort of historically disadvantaged populations might be served?

By sort of public partnerships and public investment. So, I am fascinated to hear about, sort of these are what the governor calls “new collar jobs” that sound akin to the types of employment we're seeing around the Newport News Shipyard. And I think it would be interesting to see if we could sort of build up that kind of high wage, apprentice opportunity elsewhere through the aviation industry.

Mr. Flynn: And certainly we have, you know, we have the opportunities for that. For really decent wages, be an aviation mechanic. LaVern is here. Laverne, your folks when they graduate and go into a program, what kind of median salaries do they see? Or, Bud, if you’re seeing it?

Mr. Oakey: $55,000 and up plus benefits in full-time jobs. We can take LaVern’s kids right out of high school and, in 18 months, certificate 'em! We can do the same at Blue Ridge Community College. We can do the same at Liberty University School of Aeronautics. If the child could make the commitment.

There are higher paying jobs right now. I can tell you three companies that all of which will hire 5 A&P certified mechanics today. Laverne can probably add 20 companies to that in Virginia alone, and that's before we get out of state. That's the frustration we have as an industry. We have the job demand. But we can't get the kids into the pipeline.

With the interest to go into the pipeline, we can employ graduates if they want to work. And we look at these underserved neighborhoods that we keep talking about and you know the state or the city or the town. We gotta get these kids out of high school, but we can’t get him out of high school. We can employ them if they want to work. We just gotta get them into these programs.

Mr. Phillips: OK, this is a Laverne again. I figured out I got muted and figured out how to unmute. I'm working from home as I'm sick today, but on my phone that's all I got left. Anyway, high schools where you're talking about. I've been calling all schools; all FAA 147 schools. Trying to talk to them, and I find that Ohio is one of the big ones that engages high schools where they actually have some schools or high school program. Only summer high school and adult programs mixed, and I'm finding more and more of these threw out as I make my phone calls and talking with the faculty. What they are doing in the high school program because they have to complete high school curriculum is that they are completing general and some of them as a single rating airframe or power plant by going through summer and extended hours, which means the parents are also involved along with the school system for that to happen.

One of the things I heard was it almost knocks the students out of sports because of the extra time requirements, but there is a way in that UA rack is supposed to make it easier for the 147 schools to work with high schools because they're going to classify them as satellite locations. But that legislation had been at work for years and is still not approved yet. So maybe they can answer more about that.

Mr. Flynn: Yes, that's great. Thank you. So it seems like we're getting the vision of a way to move forward. Lots of loose ends of course. I think if we get this small group going, it'll certainly refine things a lot. Do you all agree with that sense of where we are?

Mr. Phillips: I agree that it's going forward and we seem to have some conformity in there and in thought.

Mr. Dallaire: I agree.

Mr. Oakey: We agree.

Mr. Flynn: Alright. Well, then are there other things that we should be reporting to the General Assembly or having this small work group do? And I'm not suggesting that there are, but just asking the question.

Mr. Phillips: Well, yeah, I want to look at one thing I said. I sent a video out. We were talking about how do we reach into the schools and let them see some of what is available? And I know that the same thing exists in the pilot training up in Danville. They've got a great program there. I know they gotta have some videos of things that we could get into the high schools counselors and gives out to the least juniors and seniors, if not earlier. All right?

Mr. Flynn: And, Travis down at Averett, how are you all? How does this strike you all?

Mr. Williams: Yeah, I, I think he's got a good point and that's something that we try to do. We try to get out to as many of the local high schools as possible. You know, that's one thing I've noticed even when we've worked with Ian and the Space Grant Consortium. I think what we see is in the metropolitan areas, then, you know, Norfolk and Richmond and up in the DC area. You know there is interest, and I think the high schools are doing a pretty good job. But it's the rural part of the state that we don't know how well we reach them.

But the students who we have been able to pull from the far reaches of the state have been some of the best students just because I think, you know, they grow up not seeing a lot of aviation. But, then when they got kind of immersed in it, you know it really sparks something in 'em. So, to me, it's how do we find a way to reach the entire state?

Mr. Flynn: Well, I think we have a sort of a way to move this forward. So what I'll suggest is that we will write up a work plan and then we'll start doing a draft of report circulated for comments. And you know we have some volunteers who have either volunteered themselves or I'd volunteer and try to get people started on these small group meetings. Does that work for everybody?

Mr. Phillips: Certainly works for AIM, and you can put me down as being available.

Mr. Flynn: Yeah. OK. Thanks. Alright, any other thoughts?

Mr. Dallaire: Mark, just a quick light at the end of the tunnel. We just got authorization to hire mechanics yesterday, so we're really excited about that. Looking forward to some increased flight schedules next year. Obviously COVID is starting to pull back up, so we'll see what happens. But we're excited about that. We have critical level of operations that we need some more mechanics. So good news.

Mr. Flynn: Yeah, that really is good news. I mean, you know your company is betting big money on getting that right. That's great, yeah.

Mr. Campbell: Do you have any idea how many in Virginia?

Mr. Dallaire: We are teetering right now on whether we'll need to hire some in Richmond and Roanoke. Our level of operations in those two cities are holding tight. We've been moving some mechanics through some critical need positions at our Roanoke facility. Bringing them in as custodians and then letting them transfer into aircraft mechanics so that has kept us kind of above where we need to be. Our

level operations are OK there. I'm expecting Richmond is probably going to end up having to hire in December.

Mr. Campbell: OK, great. Thank you.

Mr. Flynn: Alright. Anything else then? I think we have a way to get this going. I guess we'll conclude this meeting. You will see from us a Christmas present, very soon, in the form of a draft report for you to review. I want everybody to feel completely free to mark it up, send it back, and if we need to have another phone call or Zoom meeting to discuss things, we can do that. I think that's it then.

Mr. Oakey: Thanks everyone.

Mr. Flynn: Thank you, all.