PRIMARY MESSAGE: Federal investment is needed to assist and encourage support for STEM education in PreK-16, ultimately preparing Americans for the workforce.

Remarks Submitted by Larry Plank, Director for K-12 STEM Education, Hillsborough County Public Schools, Executive Director for the National Science Leadership Association and Director for the Tampa Bay STEM Network.

Chairman Blunt, Ranking Member Murray and members of the Committee, it is my pleasure and honor to be here today to speak with you about the importance that the federal government plays in STEM education. As the Director for K-12 STEM Education in Hillsborough County Public Schools, I am responsible for not only supporting the academic endeavors of our community's children, but also responsible for teacher professional development and the appropriate theming of our magnet schools and career and technology education academies so that they are best connected to the workforce needs of the greater Tampa Bay region.

Facing a global economy growing ever more technologically-based, a national need for STEM-literate citizens has arisen. As a national leader in education, Hillsborough County Public Schools is well positioned to answer this call through our comprehensive STEM education program. Hillsborough County Public Schools is the eighth largest school district in the nation. With over 250 school sites and over 213,000 students, our district is a microcosm of the nation, from core urban areas in inner-city Tampa, to the suburbs of Brandon and Tampa Palms, to the rural areas of Plant City—all with unique challenges.

We pride ourselves upon preparing and inspiring the next generation of STEM-literate citizens who will directly contribute to the STEM fields through the workforce or post-secondary education. While many STEM initiatives prepare only some students for success in STEM fields, it is important to us and our community that all students have equitable experiences and access to STEM opportunities. My role in Hillsborough has been to ensure that every student has an opportunity to enjoy science, technology, engineering, and mathematics in a highly supportive setting that encourages and fosters their own creativity, innovation and perseverance.

In an effort to build a successful STEM program for our region, we've identified four elements of the work, all supported in part by federal funding streams. In some cases these funds are in the form of Title dollars, in others competitive grants through the Department of Education or Federal Agencies such as NASA and NOAA. The braiding of funds has allowed us to efficiently and effectively support STEM education and workforce development in our region.

These elements support our work, which includes 1) improving instructional practices in mathematics, science and STEM-related course at all grade levels to increase student achievement, 2) connecting student learning in the classroom to careers for the 21st century in an effort for students to experience their future, 3) building relationships in the community that positively impact student achievement in and appreciation for STEM, and 4) supporting STEM

learning and achievement across multiple settings and environments that afford students the opportunity to apply what they have learned.

Essential Element 1: Curriculum Innovations that Support 21st Century Skills and STEM Learning

Curriculum innovations consist of changes to the standard curriculum, associated instructional practices and district protocol that promote STEM programs and understanding and support learning in STEM subjects. At the center of this effort lies professional learning for teachers– from professional learning experiences to on the job support through academic coaching and modeling—all to support innovative practice and content standards that define the integrative STEM approach to curriculum.

Example of Success: Department of Education Math/Science Partnership Project: AMP STEM

The Accelerating Maximum Potential in STEM (Mathematics and Science Partnership) was funded by the US and Florida Departments of Education to provide professional development to K-12 STEM teachers and support integrative STEM practices in K-8 classrooms. Our award amount is $4,500,000 for 3 years, and through this grant project we will provide nearly 50,000 hours of professional development and create, pilot and publish over 48 integrative, STEM-centric lessons for elementary and middle grades to be shared with the state of Florida. In addition, the grant also assists us in preparing teachers for certification examinations in hard to certify areas, such as 6-12 Mathematics, 6-12 Chemistry and 6-12 Physics.

Example of Success: Title I Funding to Create Equitable Experiences for Students

Hillsborough also utilizes Title I funds to create equitable learning experiences in our Title I schools. Over 63% of our students qualify for free and reduced lunch, and the district has a majority of schools that receive Title I funding. While these dollars support a wide range of services for our schools, in the STEM arena we utilize the funds to support academic coaches in mathematics, science and STEM as well as additional training for our teachers. In science and STEM laboratories and classrooms, we have purchased state of the art learning tools and technologies, and in mathematics classrooms virtual and hands-on manipulatives to support rigorous content and practice standards.

Example of Success: Tampa Bay Master Teacher Fellows Program

The Tampa Bay Master Teacher Fellows program is a competitive grant funded in part by the National Science Foundation to support twenty teacher-leaders in grades 6-12 who serve as district liaisons for new teacher induction, inservice teacher professional development, preservice teacher education and curriculum design and revision. The award amount is $1,300,000 over 5 years.

Essential Element 2: Establishing Career Pathways that Support Employment in STEM Fields

According to the STEM Education Coalition – which is chaired by the National Science Teachers Association – the average wage for all STEM occupations is nearly double the average for all occupations. However, the importance of preparing children with basic STEM skills is about more than economics. In today's economy every student needs to have a strong foundation in the STEM subjects in order to land and succeed in virtually any job – from the shop floor to the research lab to the boardroom. And every citizen needs STEM skills to participate knowledgeably in our democracy where so many opportunities and challenges come from advances in science and technology.

While the nation struggles with a high level of unemployment, thousands of positions that require skills related to STEM are unfilled, costing the US economy billions of dollars. The same can be said for greater Tampa Bay. In response, our district has continued to finely tune traditional programs in Career and Technical Education (CTE) to address the needs of the nation and serve the community of students to whom we are responsible.

Example of Success: Magnet Schools supported by Magnet Schools of America and Grant Opportunities

Hillsborough County Public Schools has a high number of magnet choice opportunities for students, ranging from the performing arts to biomedical science to aerospace and engineering. Magnet schools can be found in all grade levels: elementary, middle and high. Competitive grant dollars have been utilized to create a template for each school site, after which the district has maintained the programs. These seed funds are utilized to write curriculum, create school content, support teacher professional development and the unique tools for learning that a school may need to meet a magnet mission. A list of HCPS STEM schools is included in the supporting documents.

Example of Success: Perkins Funding

While the level of funding under Perkins has diminished our district continues to use this funding stream to establish programs of study that foster growth and understanding of relevant STEM content. We do this by incorporating instructional models from mainstream curriculum, such as inquiry-based experiences and engineering/design challenges and strengthening connections to local industry with technology-based workforce agreements, and finally by adopting best practices through Career Academy models. Perkins funding supports the professional development of teachers, field experiences, and tools of the trade in high-tech STEM learning environments.

Essential Element 3: Fostering Community Relationships that Support STEM Learning

Many school districts are concerned with making connections to the home to ensure parental support for students in the educational process. Research suggests that practices which garner parental support result in student learning gains and success throughout the K-12 system.

However, establishing parental connections with STEM-related programs is more difficult than in other areas due to parents' inadequacies in STEM understanding or familiarity.

In addition to parents, supports from academic, business and community (the ABCs of STEM) partners are more essential to STEM programs since public schools rely upon these institutions for innovations within the STEM fields, financial supports and academic supports.

Research from the National Academies suggests the community-based ecosystem approach to STEM education has merit and should be further explored. Recently, organizations such as the Teaching Institute for Excellence in STEM and the National Science Foundation have supported such ecosystems through grant opportunities. The NSF INCUDES and STEM-C solicitations both include language regarding the building of community support from multiple sectors in their request for proposals.

Example of Success: Tampa Bay STEM Network

Tampa Bay STEM Network was born in 2016 and is funded in part by the STEM Funders Network, Samueli Foundation and Teaching Institute for Excellence in STEM to develop a supportive network of collaborating partners in STEM education in the Tampa Bay region. Locally over 25 academic, business and community partners have committed to this call.

Essential Element 4: Value-Added and Non-traditional Programs that Support STEM Learning

Research suggests that much of what students learn in STEM disciplines, especially science, occurs through discovery and exposure to content outside of the typical classroom. This learning can occur through self-guided exploration, experiences at informal science institutions, as well as through a variety of media.

In addition, states and districts must utilize value-added programs, such as after school extended learning programs, Saturday school, competitions, fairs and other community events to bring content to life for students. The STEM disciplines present an opportunity for non-traditional and value-added measures, yet many school systems fail to make these connections.

Example of Success: 100Kin10's Early Childhood STEM Learning Project

In 2013, 100Kin10 announced $2 million in funding for a competitive opportunity for partners to propose "moonshot" ideas that will help support the creation of active STEM learning environments in grades P-3 in schools across the country. Focused upon teacher effectiveness and encouraging experimentation, this opportunity is intended launch great solutions to the root causes of this overarching challenge in STEM education.

There is much more to be done, however, so please consider our "ask".

When Congress reauthorized the Every Student Succeeds Act, they eliminated the Math Science Partnership program and instead opted to consolidate this program, and other competitive grant programs, into a single, formula-funded, flexible block grant, now known as Title IVA, Student Support and Academic Enhancement Grants (SSAE).

I applaud the fact that the new federal law now gives district leaders more flexibility in choosing programs that will best fit the specific needs of our schools. But as Hillsborough and thousands of districts nationwide prepare to implement the new federal education law, we must be able to rely on the federal funding levels that Congress authorized in ESSA if we want to see this law succeed.

I am asking that you, members of the Senate Appropriations Committee, support full funding of the ESSA Title IV Student Support and Academic Enhancement Grants at the authorized level of $1.65 billion. I would also hope that your Committee will also make clear that this program will continue as authorized by Congress as you resolve the current Continuing Resolution for this fiscal year.

Districts could choose where best to spend their SSAE grant dollars in order to help all students develop the skills essential for learning readiness and academic success. Title IV SSAE funds would allow high need districts to promote hands on STEM learning, develop and provide more computer science courses, create STEM specialty schools, and integrate informal and formal STEM programs.

SSAE will also fund safe and healthy student activities, including student mental health services; allow students to have more access to accelerated learning courses; provide for more courses in physical education, art, music, foreign languages, and college and career counseling; and support the effective use of technology through professional development, and access to technology and digital materials.

I am concerned, and I know many of you have heard from your constituents, that diminished funding for the Title IVA SSAE grant would force many school districts to choose between badly needed programs that can positively impact students. Tough funding decisions must be made in this budget, but under funding ESSA Title IVA is in direct opposition to Congress's intent to provide greater flexibility for districts and schools.

In addition to supporting Title IV, the committee should also consider the highest possible level of funding for ESSA Title II Supporting Effective Instruction State grants. This program provides support for teacher quality improvement initiatives, including professional development and teacher leadership, and provides states with flexibility in addressing STEM-specific challenges in this area.

We would also like to see the highest possible funding level provided for Title IV Part B (21st CCLC). New language in ESSA allows 21st CCLC to fund high-quality STEM programming in afterschool and summer learning programs.

I would also like to encourage you to work with you colleagues to support the highest possible funding level for the National Science Foundation's Education and Human Resources (EHR) Directorate. This funding supports discovery and innovation at the frontiers of STEM learning and teaching, supports the testing, assessment, study and evaluation of highly innovative models and approaches to learning, and fosters linkages between STEM education research and practice that improve the effectiveness of programs across the federal government and at the state level.

Funding for NOAA education programs should also be continued. NOAA is mandated to support and coordinate educational activities to enhance public awareness and understanding of ocean-related issues. NOAA education activities are authorized under the America COMPETES Act, which obligates NOAA to carry out science, technology, engineering, and math (STEM) activities to improve interest and literacy in STEM subjects.

The Bay-Watershed Education and Training (B-WET) and competitive education grants (also called Environmental Literacy Grants or ELG) should be funded in the total amount of $20 million in the Fiscal Year 2018 appropriations bill. Funding B-WET at $12 million would enable NOAA to resume operation of all seven of the regional B-WET programs which impact a total of 27 states and the District of Columbia. Funding the ELG program at $8 million would return it to a robust level of grant-making and national impact.

In closing, I would simply state that if we are to keep up with our global competitors, we had better step up our commitment to improving STEM education and increasing opportunities to access innovative STEM education programs both in and out-of-school.

Excellence in STEM should be embraced as a bedrock element in conquering the challenges of today and tomorrow, including modernizing our infrastructure, improving health care, defending the homeland, and fostering future industries. I feel strongly that action on STEM education policy should match the rhetoric on its importance.

The bipartisan Every Student Succeeds Act would provide schools with the flexible resources they need to support wide range of activities like science, technology, engineering, and math competitions, hands-on learning, and bringing high-quality STEM courses – including computer science – to high-need schools. The Subcommittee funding level last year was far below the level authorized under ESSA and we would like to see this funding level increased. I look forward to your questions.