



**New Discoveries Every Day  
Master Plan Vision 2018**

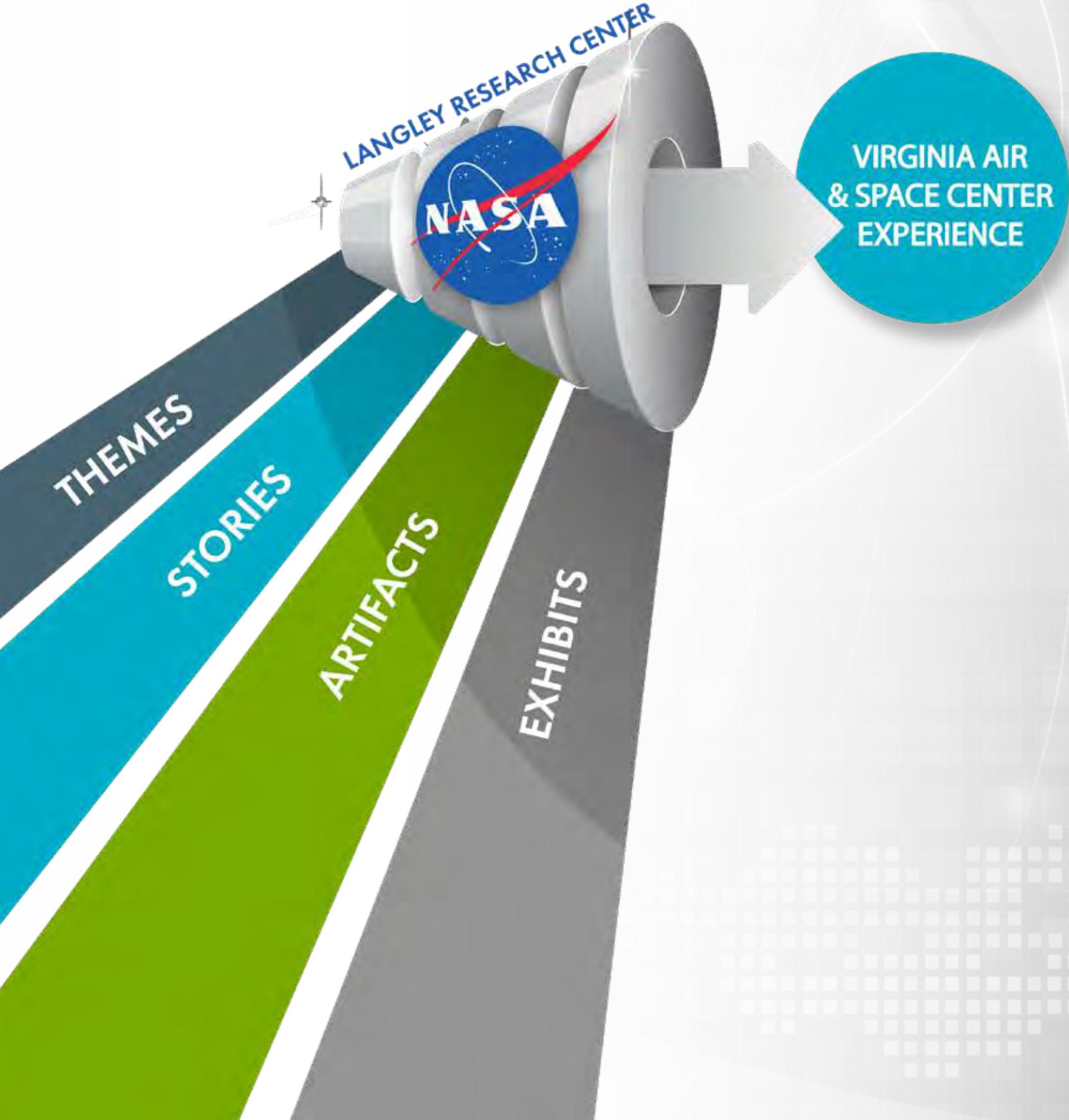
**VIRGINIA AIR & SPACE CENTER**

NASA LANGLEY VISITOR CENTER



# BRAND FILTER

**FILTER** everything through the lens of NASA Langley



# VISION: 21ST CENTURY LEADER OF INFORMAL STEM LEARNING

**Innovative. Adaptable. Passionate. Smart.**

**Responding to the challenges of the 21<sup>st</sup> Century.**

**The Future Vision of the Virginia Air & Space Center.**

To inspire the next generation of scientists, engineers, mathematicians, and tech-savvy, science-literate citizens. To tell a story no one else can tell—the work of NASA Langley Research Center.

The story will celebrate moments and people from Langley's history to reinforce a sense of community pride. But the emphasis will be on the future—empowering visitors by inviting them to solve the big problems through new interactive exhibits that don't just tell the story—they put visitors in the story.

The vision pulls back the curtain on the work of Langley engineers and researchers. Exhibits and learning labs will be arranged in experience zones that relate directly to the facilities and research conducted at NASA Langley—aerodynamics, autonomous vehicles, monitoring earth's atmosphere, new composite materials and methods, calculating trajectories for rockets, habitats for extreme environments.

The future includes exciting experiences, like a multimedia light and sound show that will transform the atrium multiple times each day with dramatic programming that breathes power, motion, and life into the airplanes and capsules on display. Interactive exhibits will go beyond telling visitors of all ages—7 to 87—about the work at NASA. It will create opportunities for them to discover it for themselves. A flexible, updatable infrastructure will keep the experiences fresh.

Just as NASA Langley has to be smart and strategic about how it guides its organization into the future by focusing on how, within its mission, it can best serve the country, VASC has developed a vision that is smart, strategic, and focused on its value to its partners and the community.

Innovative and compelling new experiences will drive new and repeat visitation, increasing earned revenue. The plan makes VASC better, but not bigger, controlling costs as part of the overall plan of financial sustainability.

**NASA Langley Research Center.**

**Virginia Air & Space Center.**

**New Discoveries every day.**

**VIRGINIA AIR & SPACE CENTER**  
NASA LANGLEY VISITOR CENTER 

**PCAV DESTINATIONS**



# LETTER FROM THE CEO

## **To our community:**

For 25 years, inspiration and dreams have been built at the Virginia Air & Space Center / the “official” NASA Langley Visitor Center. Through the visionary effort of our founders and the continued support of our community, the center has grown to educate, inform, and inspire millions of children and families. Central to the Center’s exciting exhibits and educational programs is the history and people in the surrounding community of Hampton Roads. We have a special calling to excite young minds and prepare them for new careers and workforce demands. We are capable of doing this in ways that are supplemental to formal education, especially at the elementary and middle school level. Our approach works by challenging young minds to formulate their own questions and seek out their own answers.

For all of us at the Virginia Air & Space Center, Science, Technology, Engineering and Math (STEM) related programming is not a new discovery or, for that matter, a trend. It has been the foundation of the programs we offer to school groups and families who wish to be prepared to become lifelong problem solvers in the 21st Century. We understand our educational community has limited resources both regionally and nationally. We are strengthening our partnerships to compliment the work of formal education programs to prepare the next generation of decision-makers, vital to a new and dynamic workforce.

Advancing with opportunities in the 21st century requires new investments and initiatives. We are addressing this growth by creating and making available new 21st Century experience zones, educational IMAX programming, and state-of-the-art learning laboratories dedicated to subject matter such as Robotics, Earth Sciences, and Aerospace that target Virginia Standards of Learning and Federal Common Core Guidelines. With our planned initiatives we will continue the mission of educating, entertaining, and inspiring explorers of all ages in new ways.

Helping to lead us on this adventure to greater opportunity is PGAV Destinations, a leading exhibit design and experience company. PGAV has led the design and development of science centers from Detroit to Dubai. It also understands the business needs of its clients, which is why it has been chosen by other nationally recognized companies such as Busch Gardens and Six Flags Adventures. Their work at Kennedy Space Center in creating the final home for our space shuttle Atlantis is an emotional experience which fills all those who experience it with pride and inspiration. For these, and many more reasons, we are proud to have Tom Owen and his team from PGAV Destinations as our selected Master Planning partner.

The transformational change at the Virginia Air & Space Center that began three years ago and will continue well beyond the next three years is important to this community for the following reasons:

1. Preparing the next generation of Life Long Learning in order that they are competitive in a global economy.
2. Educating students and families on the past, present, and futures missions of NASA Langley Research Center.
3. Strengthening and promoting tourism in the Hampton Roads community
4. Fostering economic development and improved quality of life for the region.

The Virginia Air & Space Center/NASA Langley Visitor Center is a wholly independent private 501(c)3 educational nonprofit organization. Our relationship with NASA has been the cornerstone of our relevancy to the community. We are honored to represent NASA Langley’s incredible missions and achievements. However, the majority of our funding comes from the community in the form of philanthropy and earned revenue from visits, outreaches, and other products and services. For this reason, we are making a call for support in order to achieve new heights of excellence and execute against our new evolving vision.

Specifically, we have worked strategically to strengthen our financial position to achieve stability and sustainability. Recent changes to our exhibits and future transformational change we desire to implement will ensure that the Virginia Air & Space Center is fundamental relevant to our community. These efforts will require an extra period of intense investment too fully support the vision and plan.

Our promise to the community is a center that provides new, inspiring, interactive, and unique learning experiences, built to educate and entertain, raising the level of student performance, increasing tourism, and elevating our pride in Hampton Roads.

We hope you may consider supporting us in this very important mission.

Very truly yours,

**Robert R. (Bob) Griesmer**  
**Executive Director and CEO**

Virginia Air & Space Center

January, 2018



# Potential for Growth

Virginia Air & Space Center is located in a resident and visitor market area, which suggests potential for significant growth, assuming the product is sufficiently compelling.

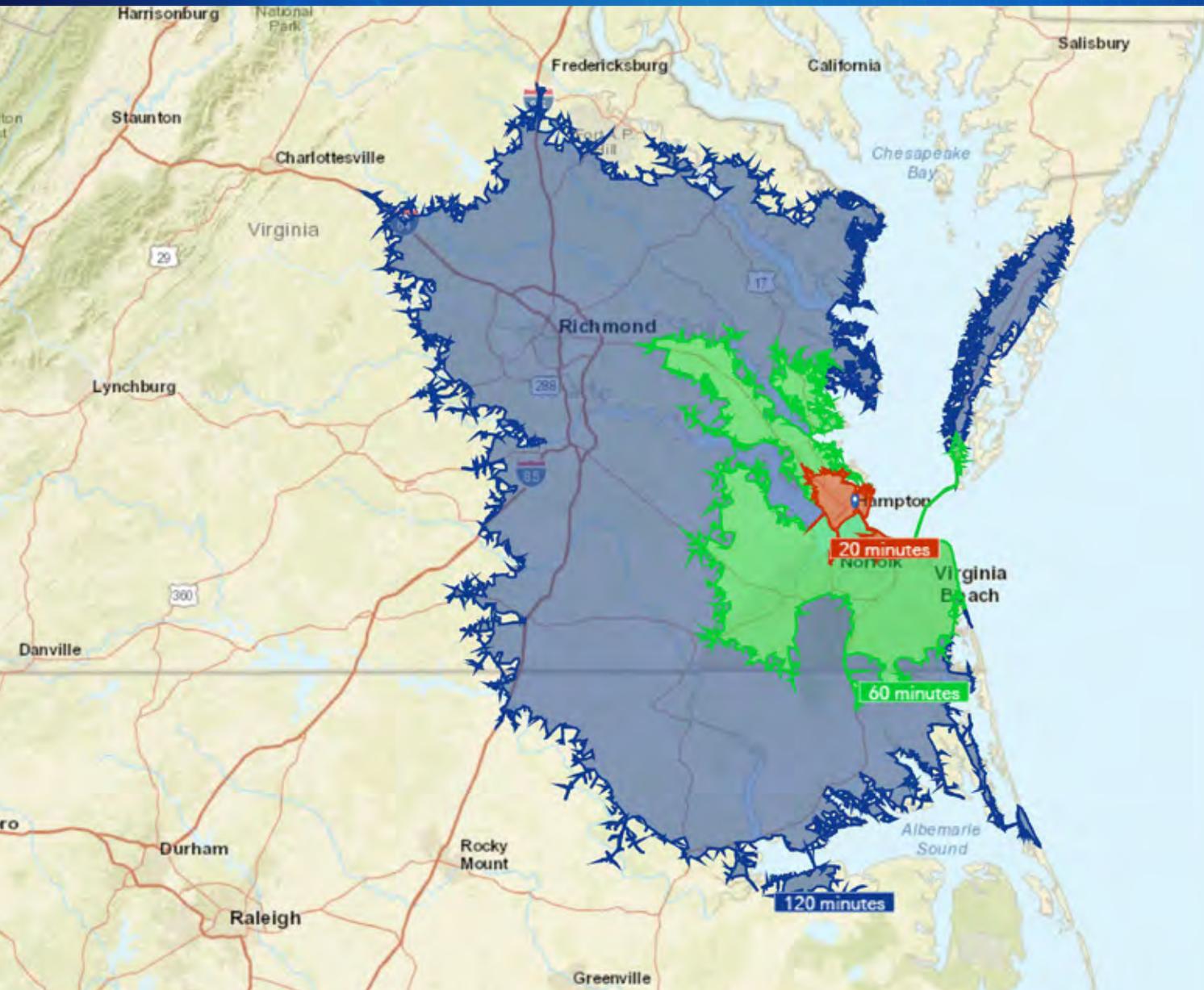
## RESIDENT MARKET

The resident market, an area defined as within a 60 minute drive time, totals over 1.6 million people. A subset of that total, 335,000, live within a 20 minute drive time. This market, especially the inner ring, has potential for repeat visitation. Repeat visitation would most likely come from families, so the experience needs to be repeatable and interactive.

Within a drive time of 120 minutes, the population tops 3.2 million. This market can be considered a close-in visitor market, with potential for repeat visitation.

## COASTAL VIRGINIA VISITOR MARKET

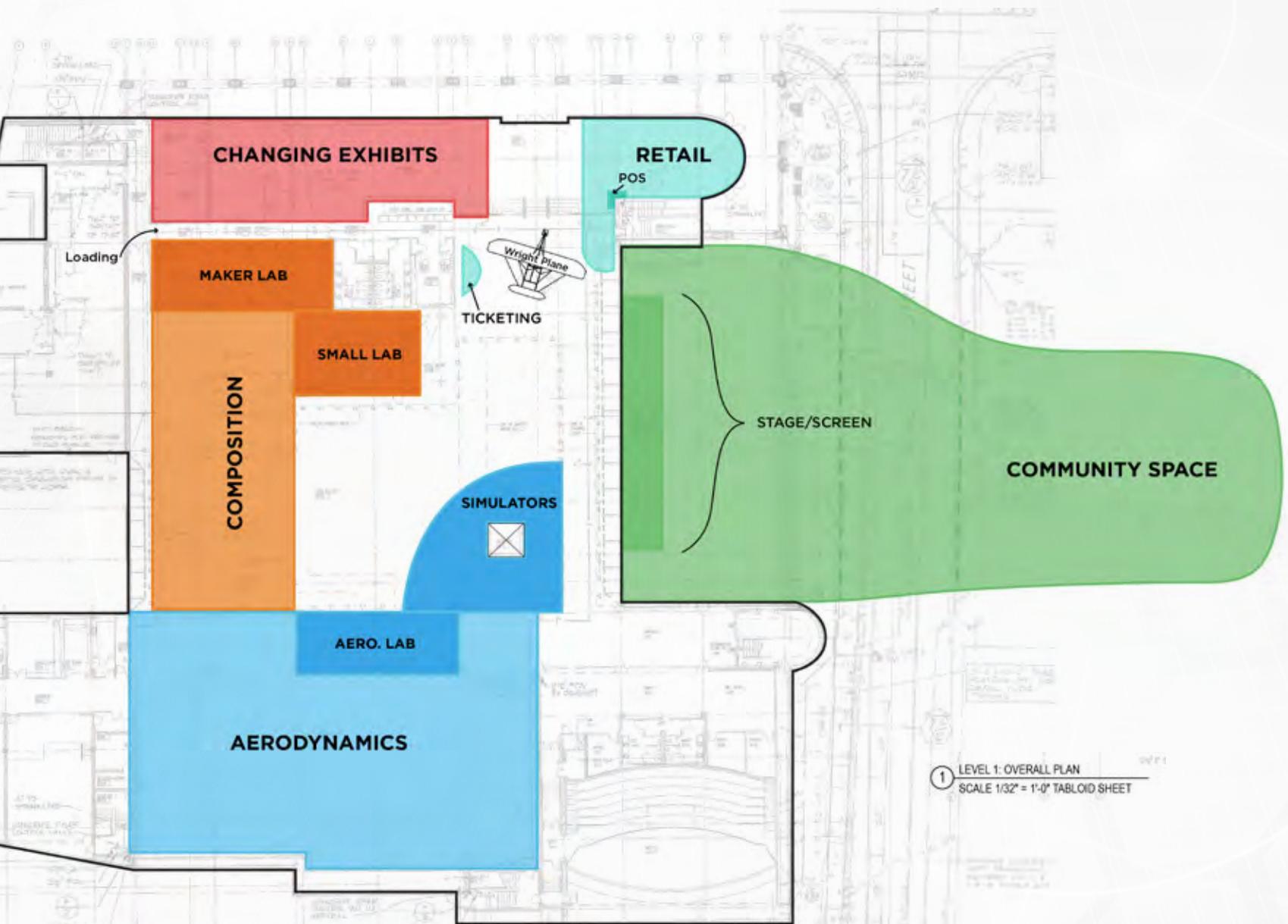
As a NASA Visitor Center and unique destination, VASC has the potential to attract visitor who have traveled to Coastal Virginia (Hampton, Newport News, Williamsburg, Suffolk, Portsmouth, Chesapeake, Smithfield/Isle of Wight, Virginia Beach and Norfolk). Over 50% of these visitors are in parties of two adults, so the experience needs to have sufficient depth and sophistication to appeal to adults.



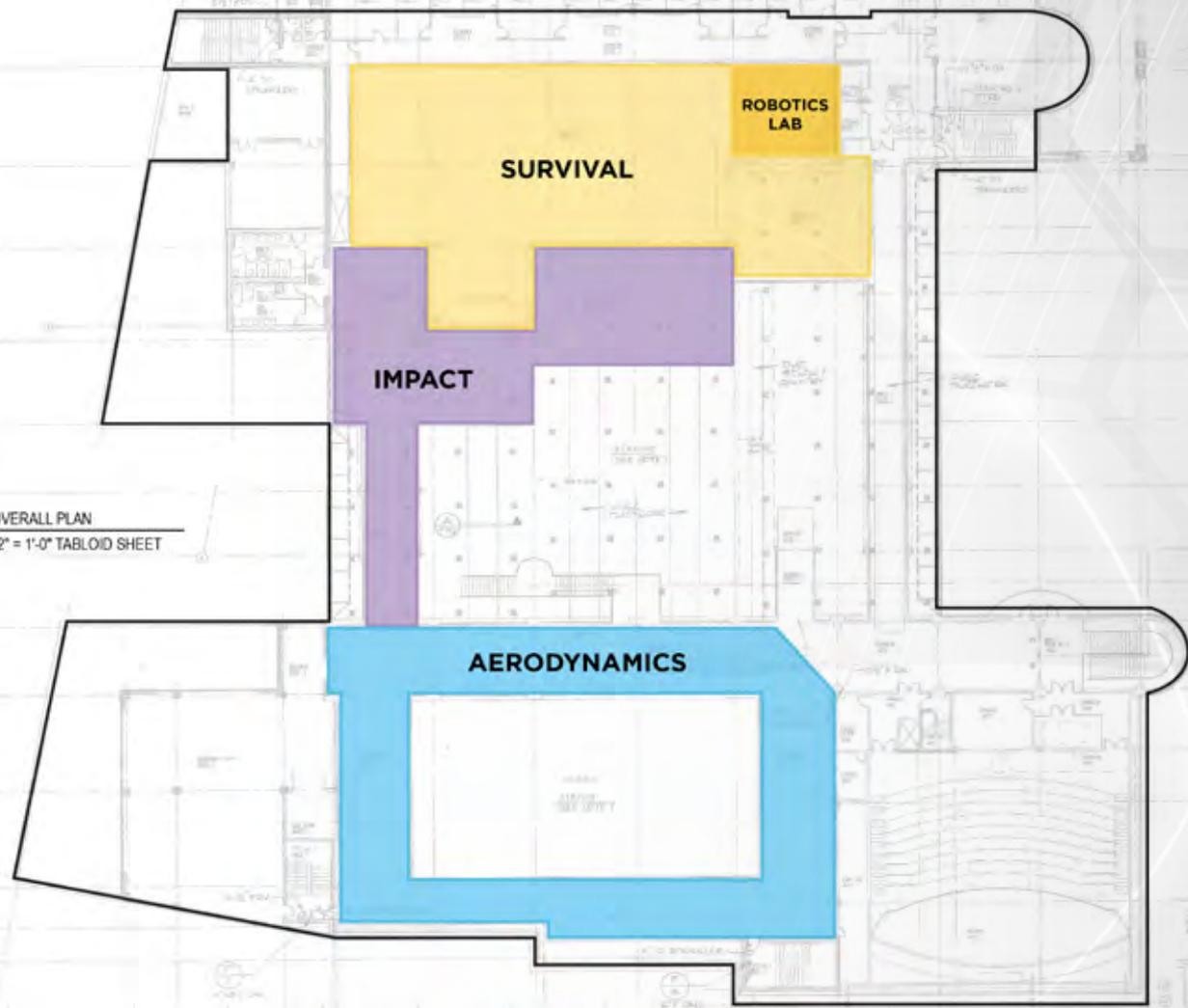
# Thematic Zones

The plan organizes the exhibits into thematic zones based on some of the types of work and facilities at NASA Langley Research Center. The thematic zones provide a way to connect key collections and interactive exhibits into cohesive story, and also help visitors understand how to maximize their experience. Transformation from the current museum organization into the thematic zones can occur in phases over time.

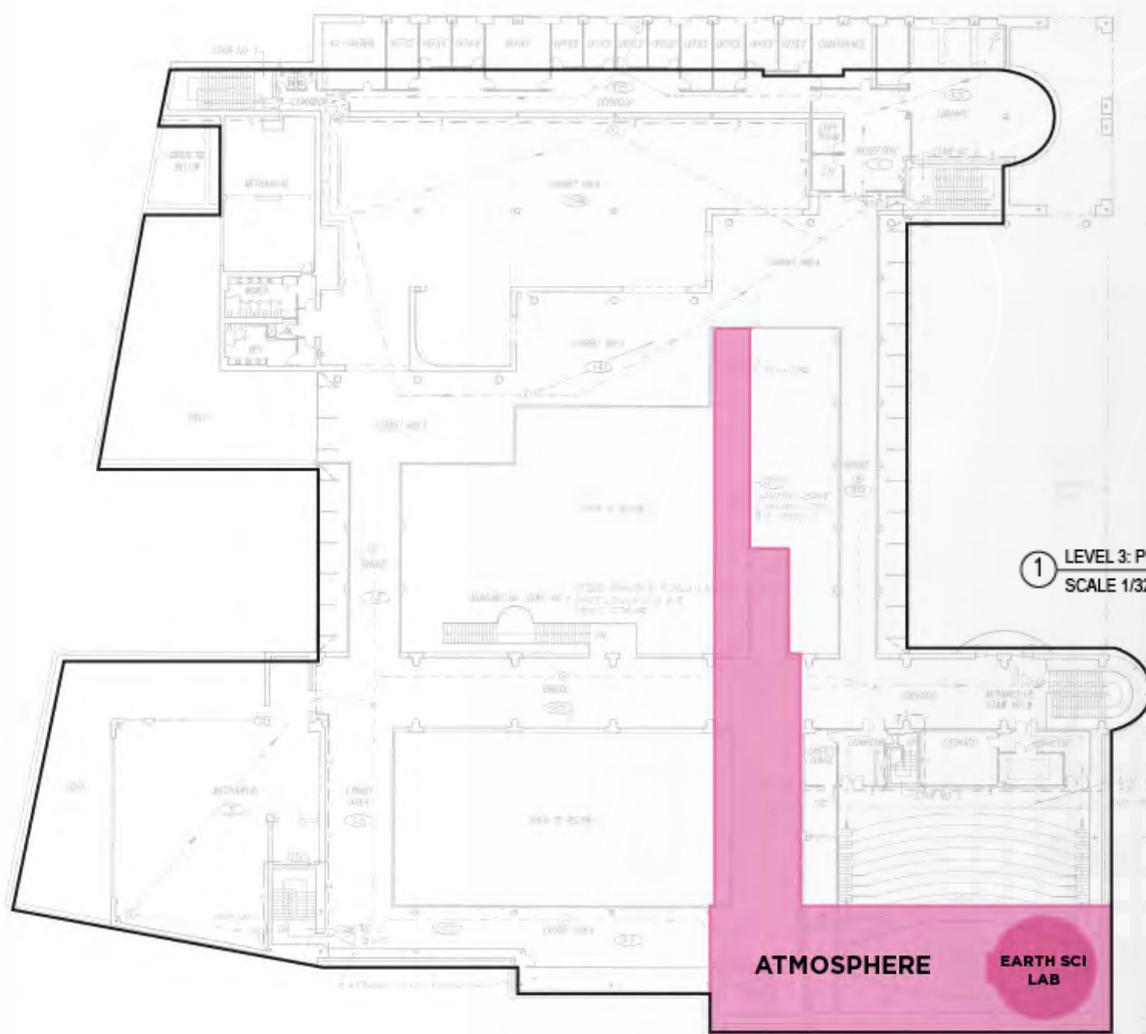
Some of the thematic zones include interactive labs that relate to the zone. The labs serve the dual purpose of engaging classroom for groups and hands-on programmatic experience for general visitors. School group visitation occurs during off-peak times for general visitors, avoiding conflicts in the dual-use spaces.



1 LEVEL 2: OVERALL PLAN  
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1 LEVEL 3: PLAN DIAGRAM  
SCALE 1/32" = 1'-0" TABLOID SHEET



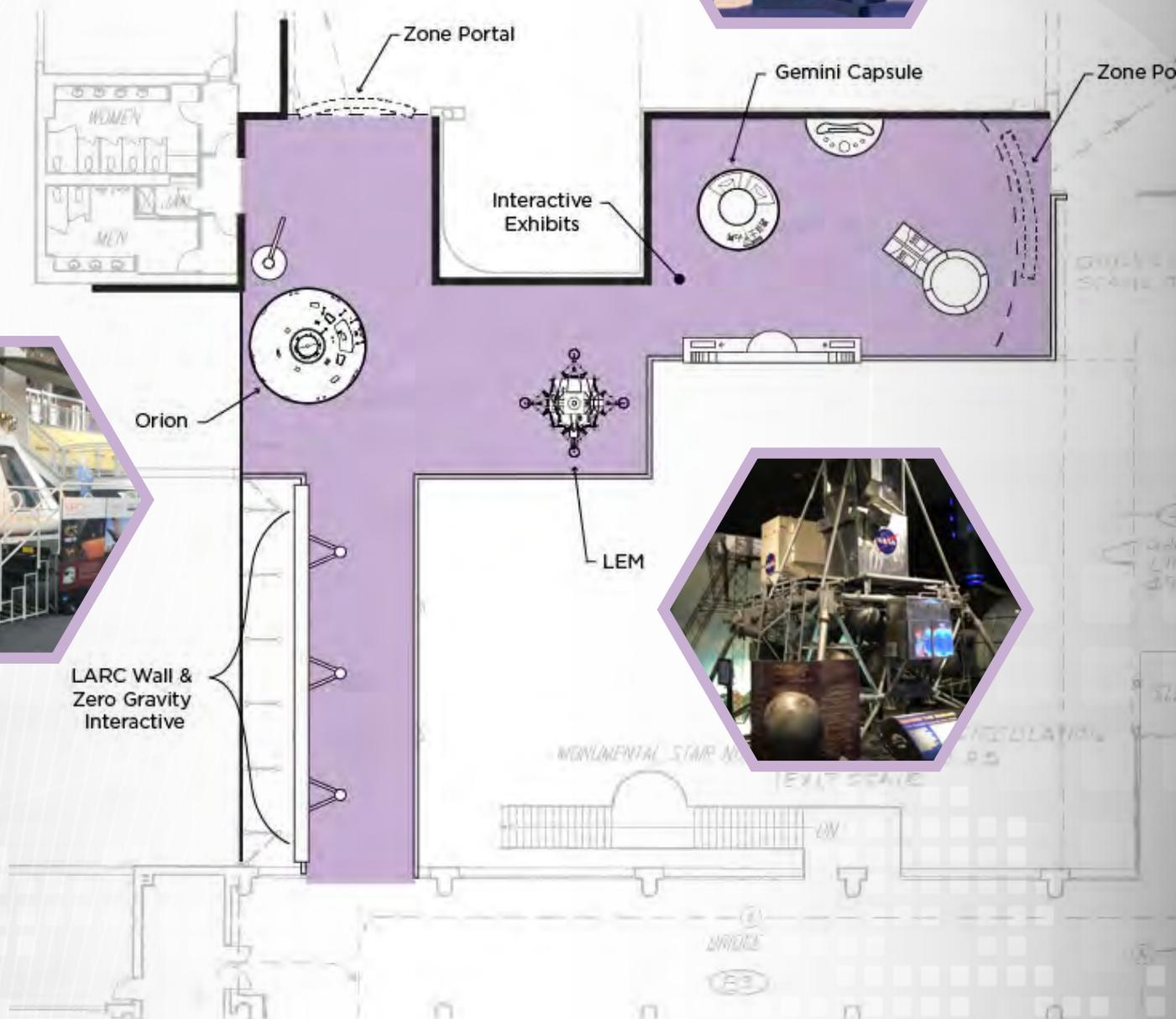


# IMPACT ZONE

# Impact Zone

This zone features the work from the Landing Impact Research Facility, including a large replica of the wall used as the background for high-speed video under the iconic gantry. Featured collections include the Orion VA-1 Test Vehicle, which demonstrates the ongoing impact testing at the facility. The Apollo Lunar Excursion Module Simulator provide a window into the rich history of the facility.

Interactive exhibits will challenge visitors to see themselves as researchers, scientists, and engineers as they conduct experiments and tests related to crash impacts, energy-absorbing materials, and human factors—similar to tests conducted at Langley. The interactive exhibits can scale up in difficulty, allowing visitors to dig deeper if they choose. Testing can include comparison and integration of computational testing with analog testing.





# SURVIVAL ZONE



# Survival Zone

Investigators at NASA Langley work on aspects of human space flight including the survivability of crews traveling to Mars. This work takes place in facilities like the Structures and Materials Lab, where teams test new types of habitats that provide protection to the crew while minimizing payload and cost.

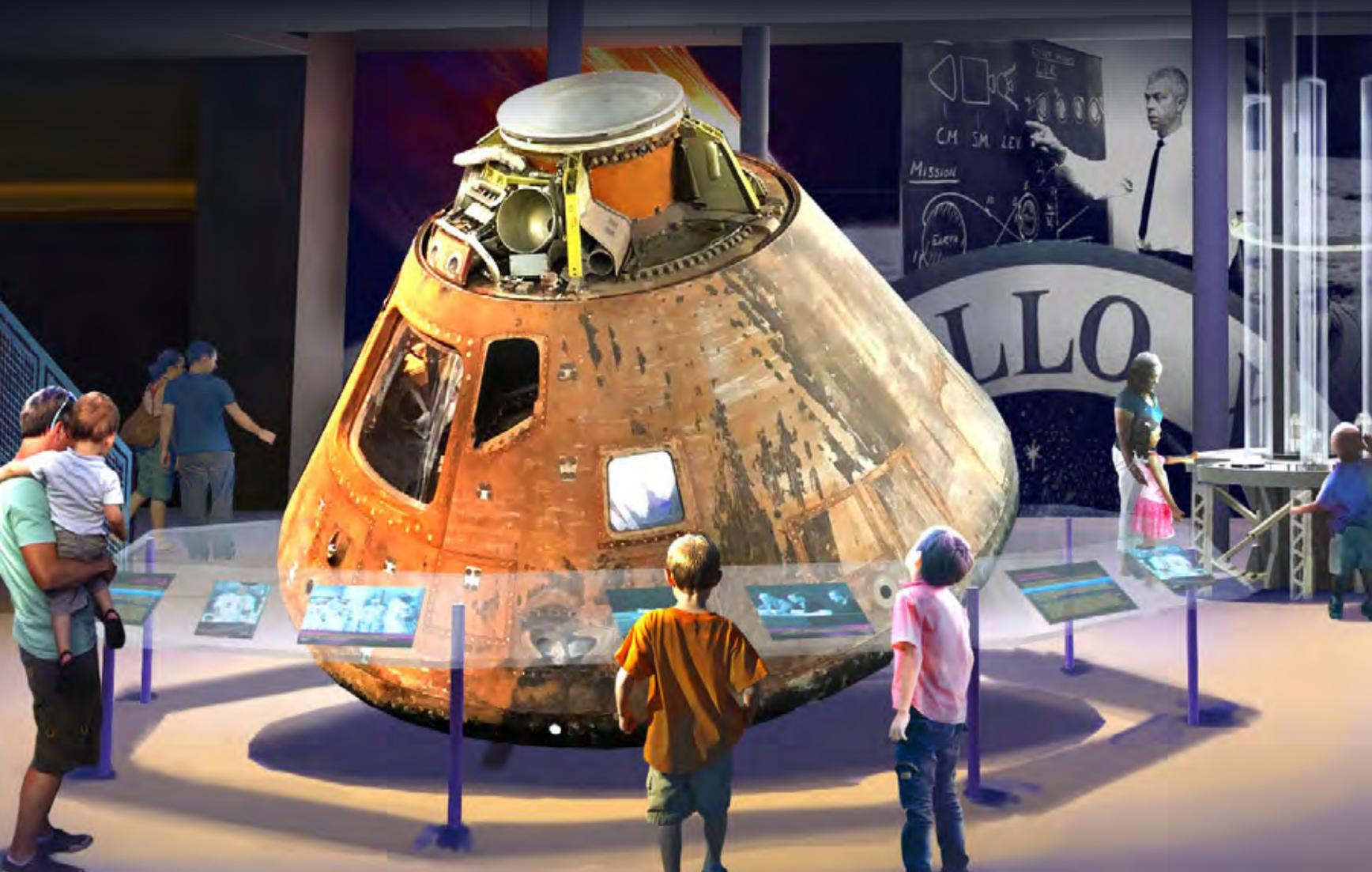
This zone will feature a prototype habitat structure representing Mars Mission work occurring now, and, along with a Viking Lander, Viking Spacecraft, and Mars Rock Sample to describe the decades-long pursuit of Mars. Interactive exhibits will provide scalable “survivability” challenges that relate to the work conducted at Langley. The Robotics Lab, set in a Mars habitat structure, doubles as classroom and interactive program area. The existing Solarium helps convey the challenge solar radiation presents to human space exploration.





Integrated Structure  
of Advanced C  
NASA Langley Research  
Hampton, Virginia

# COMPOSITION ZONE



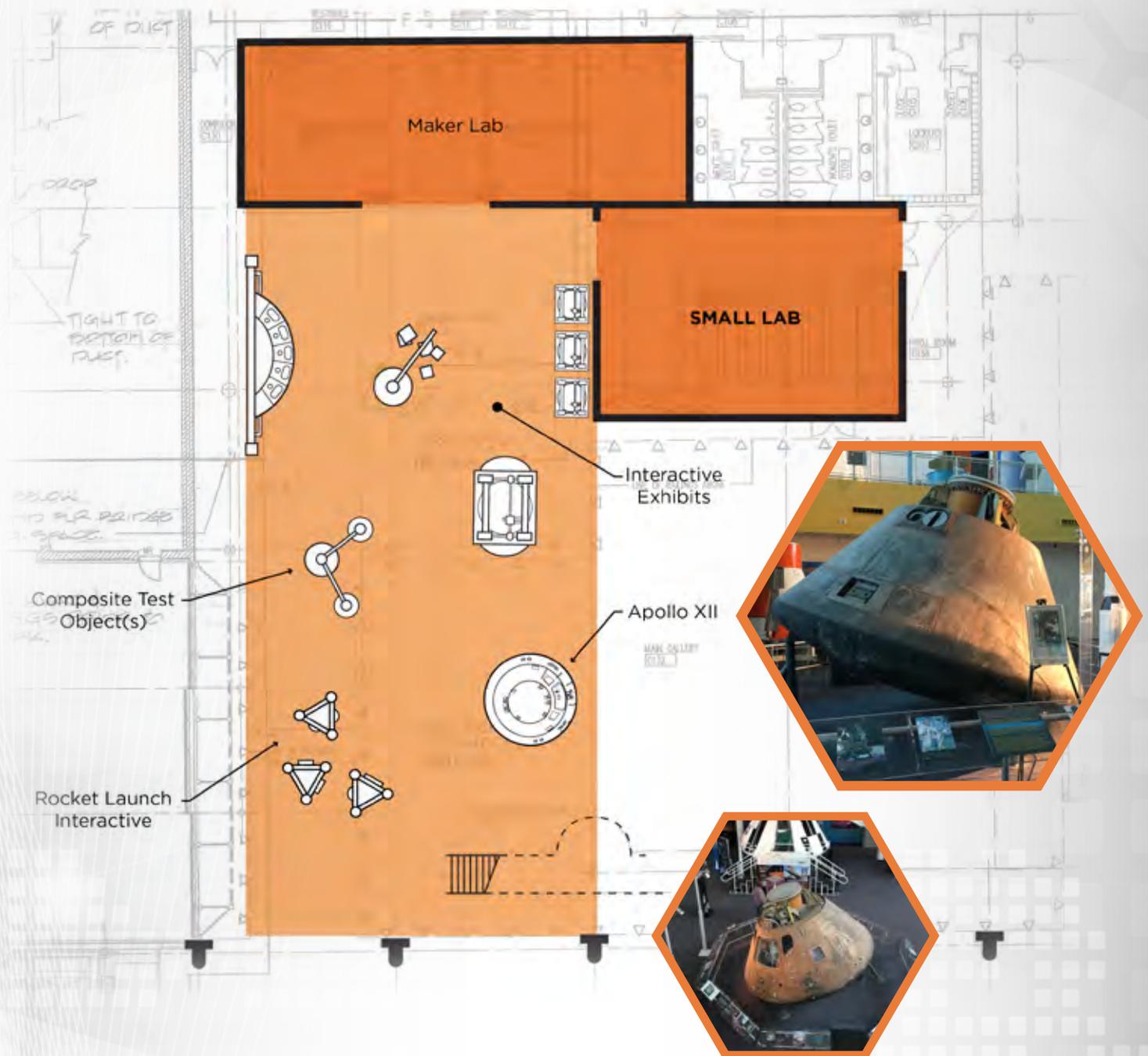
Earth  
MISSION  
CM SM LEM  
LLO

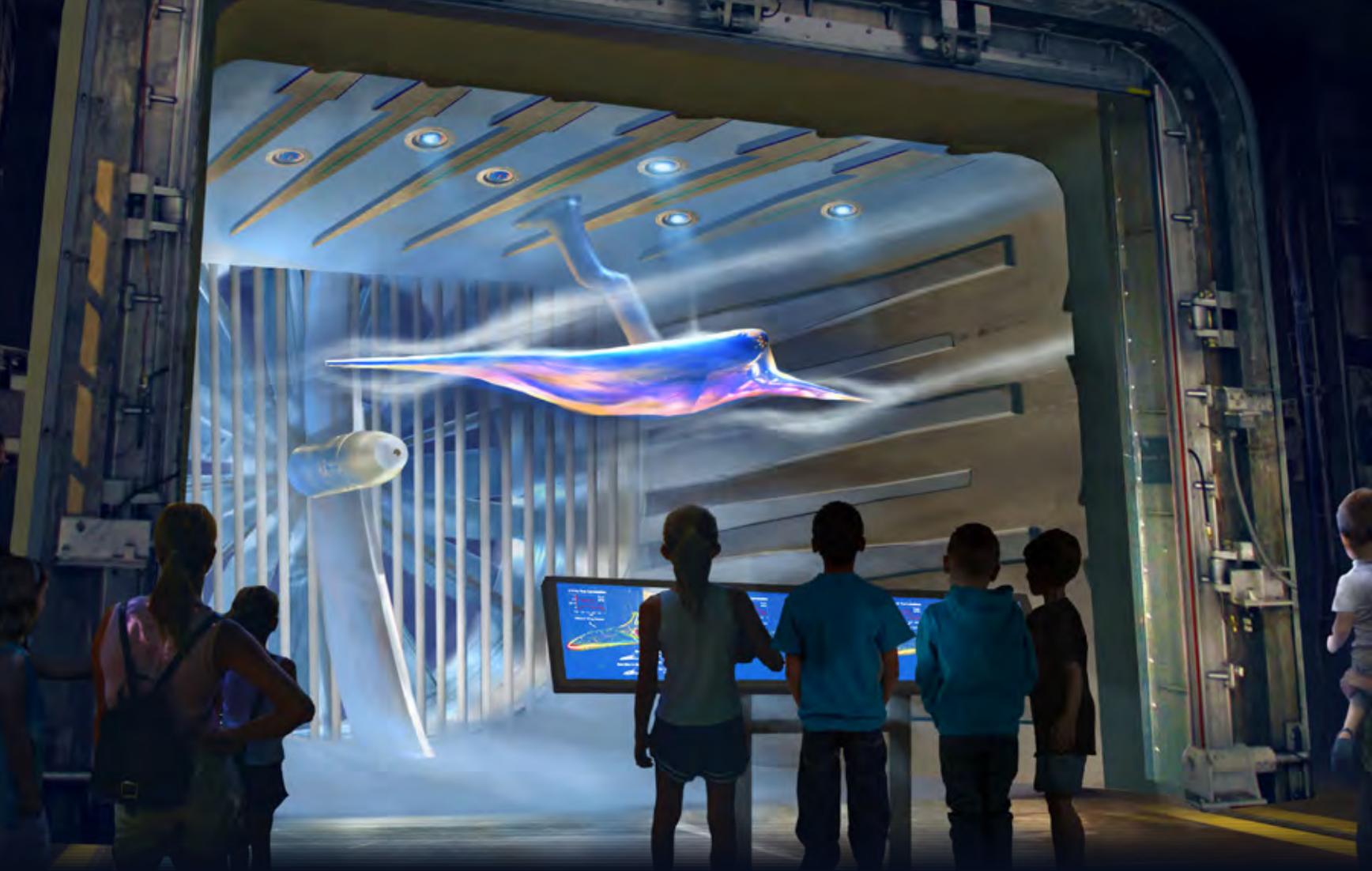
# Composition Zone

The Langley team explores new materials and fabrication methods for aircraft and spacecraft in the Fabrication Technology Development Lab. A large video screen puts visitors in the lab where the ISAAC robotic fabrication arm builds prototype composite components. As a way to illustrate the extreme forces requiring innovative solutions, this zone will feature the space-flown Apollo XII capsule with its scars of re-entry on the heat shield.

Interactive exhibits invite visitors to build computational models and conduct analog tests on new materials. The maker space lab provides a setting for general visitors and school groups to design and build prototype objects for testing. Real test articles from Langley will show the results of tests that determine structural failure.

1 COMPOSITION ZONE: PLAN DIAGRAM  
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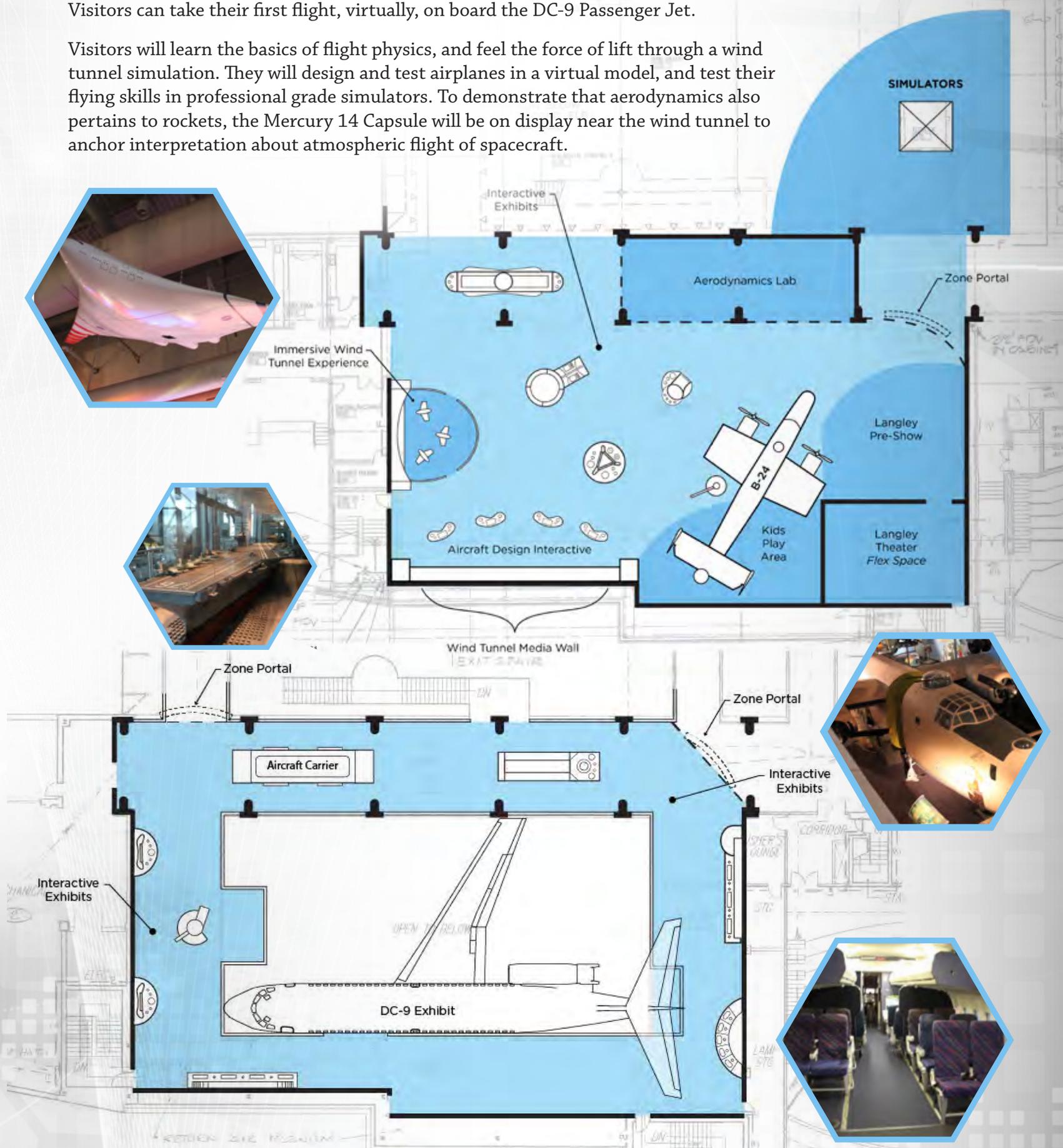
# AERODYNAMICS ZONE



# Aerodynamics Zone

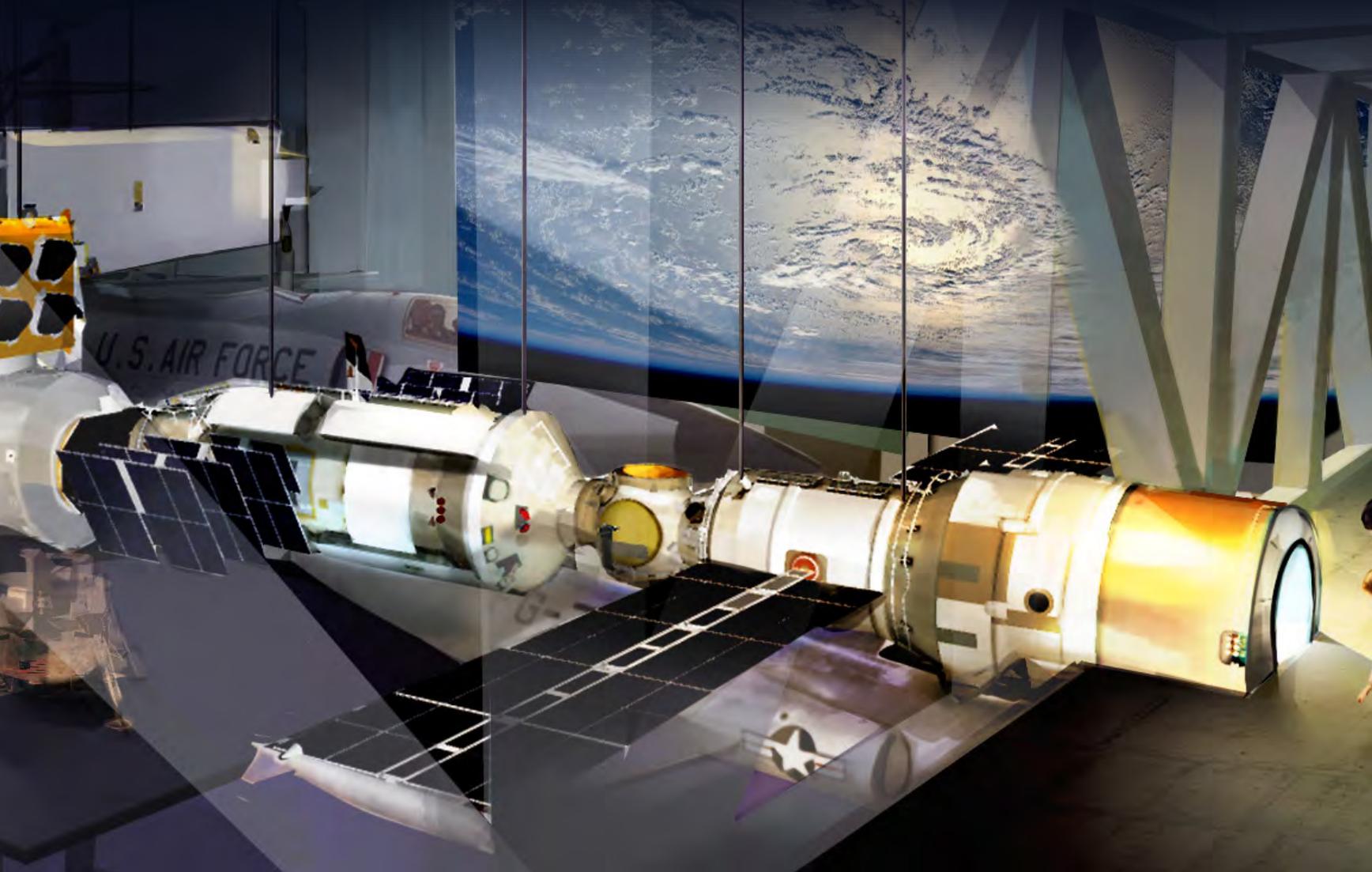
The Aerodynamics Zone features the wind tunnel testing that is a hallmark of NASA Langley Research Center. A large scale video-based wind tunnel creates an immersion experience that tell the past and present stories of analog testing, and how it fits into computational modeling today. Many of the airplanes in the collection will be incorporated into the story of aerodynamics and the progression of aviation design. Visitors can take their first flight, virtually, on board the DC-9 Passenger Jet.

Visitors will learn the basics of flight physics, and feel the force of lift through a wind tunnel simulation. They will design and test airplanes in a virtual model, and test their flying skills in professional grade simulators. To demonstrate that aerodynamics also pertains to rockets, the Mercury 14 Capsule will be on display near the wind tunnel to anchor interpretation about atmospheric flight of spacecraft.





# ATMOSPHERE ZONE

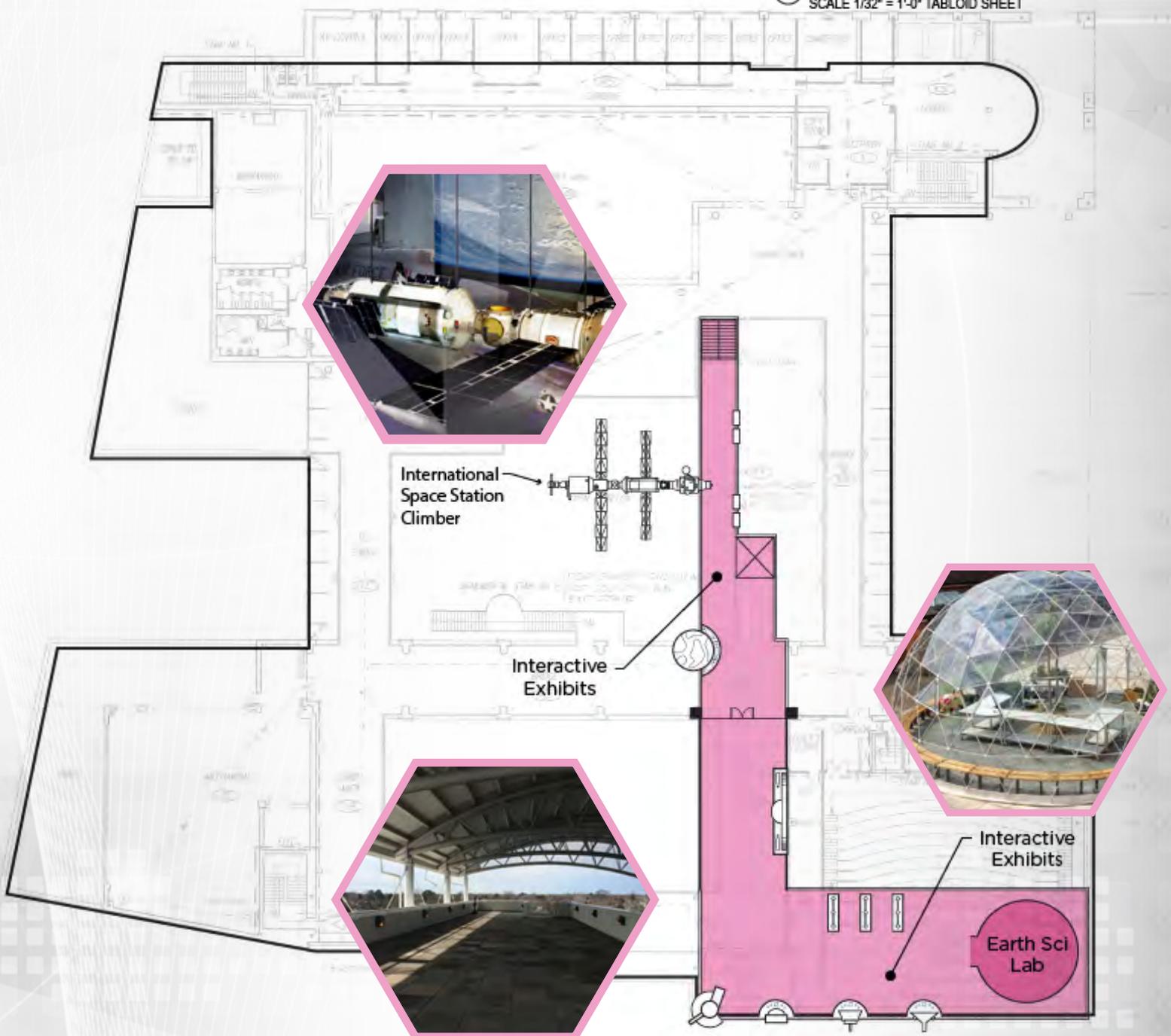


# Atmosphere Zone

This zone interprets work done at NASA Langley related to Earth Science. Located high above the atrium floor, the zone features the earth monitoring perspective of the International Space Station, which has provided a totally new perspective of our planet from its vantage point 200 miles overhead and 18 years of habitation and observation. A 1/6 scale model of ISS can hang overhead and serve as a physical exploration and imagination experience.

Interactive exhibits will feature computer models of earth science topics like ocean temperatures and atmospheric composition. Outdoor exhibits, located on the roof-top open-air terrace of VASC, will invite visitors to take real-time data of the atmosphere locally.

1 ATMOSPHERE ZONE: PLAN DIAGRAM  
SCALE 1/32" = 1'-0" TABLOID SHEET



# LIGHT AND SOUND SHOW



# Light and Sound Show

The Light and Sound Show will occur in the main atrium of the Virginia Air & Space Center. From time to time, perhaps every 30 minutes, the entire atrium space will transform from exhibit mode into show mode via changes in lighting, sound, and video will surround guests and put them in the story and experience. Lighting and video, directed onto screens, walls, and objects, will create movement and tell visual stories. Audio, in the form of voice, music, live sound, and special effects, will set the emotional tone and direct attention to different parts of the space. Because guests will be scattered throughout the center when the show begins, the show should be viewable and enjoyable from multiple locations. This can also make it repeatable because each point of view can offer content not seen in other locations.

A single show could be developed for Phase 1A, but others could be added over time to refresh the experience. When the system is not being used for the big show, lighting, sound, and video can be used as part of the non-show exhibit experience.

## ● SHOW OPTION 1: EXPLORATION

Dramatic overview story of NASA Langley as a story of the human spirit. Base it on the NASA's poetic phrases:

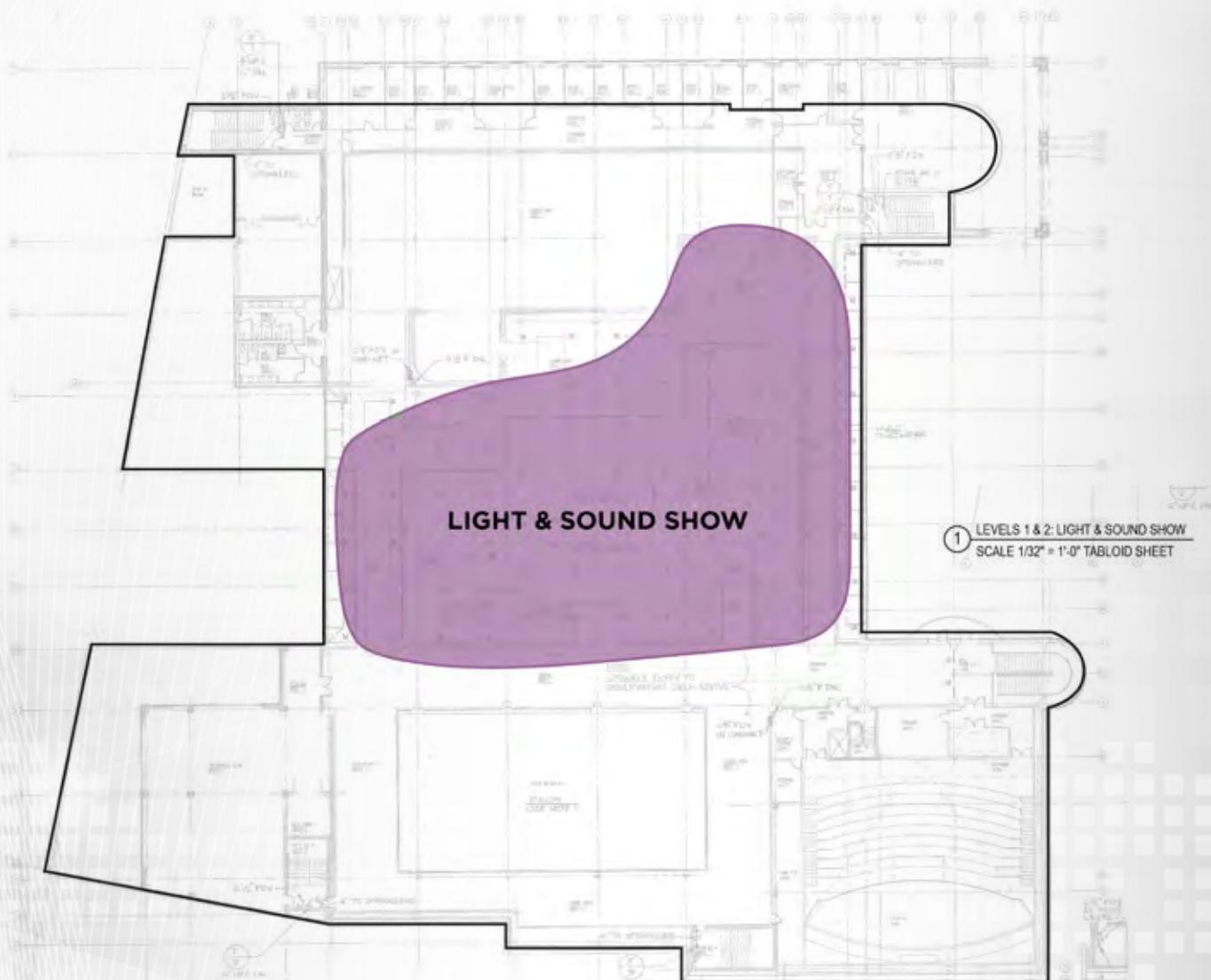
- Reach New Heights
- Reveal the Unknown
- Benefit All Humankind

## ● SHOW OPTION 2: INSPIRATION

Connect with the passion of the People of NASA Langley—why the piece of the overall project/story they are working on matters so much to the success of the whole.

## ● SHOW OPTION 3: ATMOSPHERE

Motion, speed, beautiful sunsets, dramatic storms, rising higher and higher—these images, sounds, and epic score capture the essence of flight within and beyond Earth's atmosphere. Produced with minimal narrative, the emotionally powerful atmospheric experience connects guests to magic and mystery of flight.



# MAKER SPACE

Integrated Structural Assembly  
of Advanced Composites  
NASA Langley Research Center  
Hampton, Virginia



## IN ADDITION

In addition to the thematic zones, several reimagined experiences will play a key role in the future of VASC.



### LANGLEY THEATER

The Langley Theater transforms the current Jenny Theater into a multiple program media immersion experience. A new signature film would tell the century-story of NASA Langley Research Center, and how its spirit of innovation is paving the way for future advancements in aviation and space exploration. The film will celebrate the people behind the scenes and reflect their passion that drives new discoveries.

The Langley Theater can also function as a digital classroom, using the media technology as a communication platform for school groups, corporate groups, and general visitors to experience facilitated programs on the Solar System or other topics via a large format, high-resolution flexible system.



### TRAVELING EXHIBIT/MULTIUSE GALLERY

This space can be programmed with special exhibits, events, meetings, or other programs as opportunities arise. The new location allows it to be hidden from view from general visitors when not in use, or in use for a private event.

### COMMUNITY GATHERING

The Virginia Air & Space Center building will serve as a backdrop for community events staged in Carousel Park. The east façade and elevated platform can become a stage and backdrop for live programs and large scale video projection.



**PGAV** **DESTINATIONS**  
Global Leaders in Planning and Design

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