NASA Langley Research Center

Revitalization

We Deliver on Today's Commitments and Prepare for Tomorrow's Opportunities
Agenda

• NASA Langley Research Center (LaRC) at a Glance
• LaRC Revitalization/Master Plan
  – Framework
  – Outcomes
• LaRC’s 20-Year Project Plan
• LaRC Deconstruction Projects
• Near Term Projects
  – Horizontal Infrastructure
  – Measurement Systems Laboratory
  – B1230 East Wing Renovation
• How To Do Business with LaRC
NASA Langley at a Glance (2016)

Langley’s Economic Impact (2015)

• National economic output of ~$2.3b and generates over 17,400 high-tech jobs
• Virginia economic output of ~$1.1b and generates over 8,800 high-tech jobs
• Within Virginia, executed $155m or 49% of obligations to small businesses

PY2016 Budget Estimate ............ ~$914m
NASA Langley Budget...................... ~$891m
External Business........................~$23m
Workforce......................................~3,410
Civil Servants.............................~1,830
Contractors (on/near-site)...............~1,580

Infrastructure/Facilities
156 Buildings...............................764 acres
Replacement Value.......................~$3.6b

Aeronautics $189m
Science $235m
Space Tech $32m
Human Exploration $41m
Education $1m

Safety, Security & Mission Services & Construction/Environmental Compliance & Restoration

Center Management & Operations
(Facilities, IT, Engineering, Tech Authority, B&P, IRAD, Safety/Mission Assurance, Legal, Finance, Procurement, Human Resources)

Agency Management & Operations
(NASA Engineering & Safety Center, Office of Chief Engineer, Agency IT)

Construction Environmental Compliance & Restoration
(Revitalization Plan)
Aging Infrastructure Poses Risk to Mission

• **Agency-wide**, more than 80 percent of NASA’s infrastructure and facilities by value are beyond their design life – thus more likely to be unsuitable for current and future missions.
  – Aging, Apollo-era legacy infrastructure is inefficient and costly to maintain and operate.
  – Assets over 40 years old (typical design life is 30 years) pose a risk to NASA’s unique research and development mission.

• **Risk severity rises as assets age beyond 40.**
  – To control risk, control the share and average age of assets >40

• **Maintenance backlog continues to grow.**

Whitlow – “NASA Facility Strategy Presentation” at the 2011 Facilities Engineering Conference

LaRC’s oldest building is close to 80 years old and the Center average is 44 years old – We are proactively revitalizing the Center’s core infrastructure to meet future missions.
LaRC Revitalization Framework

• Langley will provide concept-to-flight solutions
  – Address increasingly complex research solutions
  – Leverage multi-disciplinary integrated systems capability
• Langley will remain a preeminent research facility
  – Sustain/enhance essential in-house experimental capability
  – Support Aeronautics, Science, Space Tech, Human Exploration
• Langley will embrace new technologies to meet the mission
  – Incorporate computational simulation as a cross-cutting capability in everything we do
  – Implement environmentally-friendly solutions
• Langley will be agile and adaptive
  – Continually assess the needs of NASA’s missions and divest of facilities (even large ones) when it no longer makes sense for the mission and the national good
LaRC Master Plan: Outcomes

Relevance to the NASA Mission

- Facilities exist to implement programs
- Infrastructure flexible to support a diversified portfolio
- Provides relevant capabilities for current and future missions

Utilization / Cost of Ownership

- Increases infrastructure reliability (reducing growth of deferred maintenance)
- Ensures appropriate workspace quality
- Fosters productivity and collaboration

Master Plan: Agency Metrics

- Follows Agency Similar-Smaller approach
- Ensures CRV reduction
- Reduces Energy / Water / GHG
- Meets Federal, State & Local regulations
- Considers Climate Change impacts
# New/Rehab Construction Projects

**In Chronological Order**

<table>
<thead>
<tr>
<th>FY Start</th>
<th>Description</th>
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<tr>
<td>2011</td>
<td><strong>Integrated Engineering Services Building (IESB):</strong> R&amp;D Engineering Design Studio, Flight Mission Support Center, conference center, collaboration space, training class rooms and cafeteria.</td>
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<td>2013</td>
<td><strong>Facility Upgrade to B1247 Aerosciences Research Facility:</strong> Consolidate and repurpose three research wind tunnels to compliment/ enhance Supersonic and Hypersonic research capability; 20” SWT, SLDT, SAJF, Arc Heated Scramjet, M8 VDT &amp; M6 NTC</td>
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<td>2014</td>
<td><strong>Computational Research Facility:</strong> a state-of-the-art consolidated data center that allows for advanced computational research and development in a new energy efficient and sustainable facility</td>
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<td>2016</td>
<td><strong>B1230 East Wing Renovation for Safety-Critical Avionics Laboratories:</strong> Conducts cutting-edge research that will produce innovative concepts, tools, and technologies to improve the safety of current and future aircraft</td>
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<td>2016-18</td>
<td><strong>Electrical Distribution System</strong> (5 phases): modernize LaRC’s aging electrical infrastructure by transitioning to a 22-kilovolt (kV) primary loop configuration that provides a more efficient and reliable system with reduced maintenance costs.</td>
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<td>2016</td>
<td><strong>Lab: Measurement Systems Lab:</strong> State-of-the-art Laser/Lidar and Electromagnetics lab; integrates similar groups and functions from across the Center allowing for system engineering solutions that span concept-to-flight instrumentation research and development</td>
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<td>Description</td>
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<tr>
<td><strong>Research Air Compressor Replacement</strong> (4 phases): Replaces all 6 compressors and associated ancillary systems with four 8 lb/sec @ 6,000 psi compressor system that provides a more efficient and reliable system with reduced maintenance costs.</td>
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<td><strong>Materials Research Laboratory</strong>: Provides state-of-the-art, flexible, adaptable laboratories for development of new multi-functional materials including polymers, metal alloys, and nano-materials for future applications for aerospace vehicles.</td>
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<tr>
<td><strong>Flight Dynamics Research Facility</strong>: A unique experimental capability for a comprehensive suite of flight dynamics and controls research capabilities in a single highly automated facility with low operational and maintenance costs</td>
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<tr>
<td><strong>Integrated Systems Development Laboratory</strong>: Includes fabrication, environmental test and Science labs: provides an end-to-end fabrication, development and system qualification capability for Science Missions</td>
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<tr>
<td><strong>Intelligent Flight Systems: Autonomy</strong></td>
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<tr>
<td><strong>Lab: Structures; Acoustics; Flight Simulators; Crew Systems; etc.</strong></td>
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Deconstruction Projects

• LaRC will divest of infrastructure as we renew and modernize the Center
  – Office buildings
  – Warehouses
  – Research structures
  – Equipment

• LaRC plans to have 1-2 deconstruction projects each year over the next five years
Horizontal Infrastructure Projects

• **Potable Water and Metering**
  - Replaces existing sections of deteriorated underground cast iron water piping with new PVC piping from the water distribution system piping to various buildings; repair the water tower; and install new advanced water meters strategically located to monitor consumption and provide early detection and location of underground water leaks.

• **Electrical Distribution System Upgrades**
  - Transitions infrastructure to a new 22 KV redundant loop distribution system; establishes infrastructure for new construction projects; initiates gradual elimination of the 2.4kV and 6.9kV distribution systems.
  - Replaces aging unit substations and associated equipment

• **Compressor Station Replacement**
  - Replaces existing six compressors (and associated foundations and ancillary systems) with new 8 lb/sec (minimum) @ 6,000 psi compressors (and associated foundation and ancillary systems); replaces the oil-water separator system and condensate floor drains.
Measurement Systems Lab

• State-of-the-art Laser/Lidar and Electromagnetics lab
• New Laboratory will integrate similar groups and functions from across the Center allowing for system engineering solutions that span concept-to-flight instrumentation research and development
• FY16 Discrete project to design and construct a ~175,000 square foot multi-story Measurements Systems Lab
• Working with GSA on design
• Funding Source: Recapitalization
B1230 East Wing Renovation

- **Project Requirement:** Provide 24,000 sq. ft of laboratory space in B1230 for the Safety Critical Avionics Labs and personnel located in B1220.

- **Description:** Total renovation of east wing of B1230 to include HVAC, electrical, interior finishes (walls, ceilings, and floors) and restrooms.

- **Driving Requirement:** Provide laboratory/office space for the habitants of B1220 so that building can be demolished.
How to do business with LaRC

• **NASA Direct**: LaRC Office of Procurement

• **CMOE**: LaRC’s **C**enter, **M**aintenance, **O**perations, and **E**ngineering Contractor.
  – Jacobs Technology (Prime)
  – Analytical Services & Materials
  – Sierra Lobo
  – Newport News Shipbuilding
  – Genex Systems.

• **USACE/Norfolk District**: Design/Construction

• **GSA/Mid-Atlantic Region**: Design/Construction
Contact Information

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