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

<table>
<thead>
<tr>
<th>AERONAUTICS</th>
<th>SCIENCE</th>
<th>SPACE TECH</th>
<th>HUMAN EXPLORATION</th>
<th>EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>$189m</td>
<td>$235m</td>
<td>$32m</td>
<td>$41m</td>
<td>$1m</td>
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As of 2/1/16

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 **work space 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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<tbody>
<tr>
<td>2013</td>
<td>Facility Upgrade to B1247 Aerosciences Research Facility: 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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<tr>
<td>2014</td>
<td>Computational Research Facility: 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>B1230 East Wing Renovation for Safety-Critical Avionics Laboratories: 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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<tr>
<td>2016-18</td>
<td>Electrical Distribution System (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>
</tr>
<tr>
<td>2016</td>
<td>Lab: Measurement Systems Lab: 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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4/6/16 NASA LaRC
## New/Rehab Construction Projects

*In No Particular Order*

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<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>
</tr>
<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 Center, Maintenance, Operations, and Engineering 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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