



Where Ideas Take Flight

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Founded in 1917

1st civil aeronautical research lab

~\$796m PY2011 Budget

~\$765m NASA Langley budget

~\$ 31m External business

~3,600 Workforce

~1,900 Civil Servants

~1,700 Contractors (on/near-site)
(~250 students)

Langley's Economic Impact (2011)

National economic output of ~ \$2b and generates over 17,000 high-tech jobs

Virginia economic output of ~ \$1b and generates over 9,000 high-tech jobs

Infrastructure/Facilities

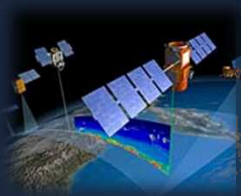
788 acres, 181 Buildings

~\$3.3b replacement value

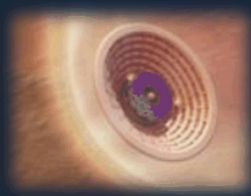
Aeronautics
46%



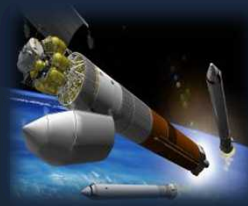
Science
30%



Space Tech
16%



Exploration
7%



Space Ops
\$.1%



Education
1%



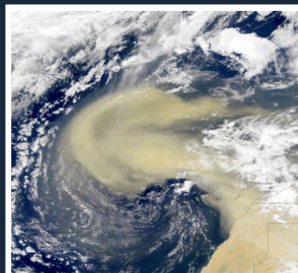
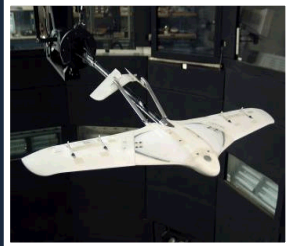
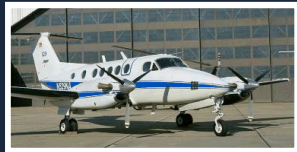
Cross-Agency Support Program & Construction/Environmental Compliance & Restoration

- Center Management & Operations

- Agency Management & Operations

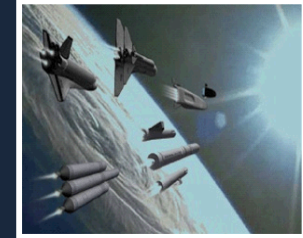
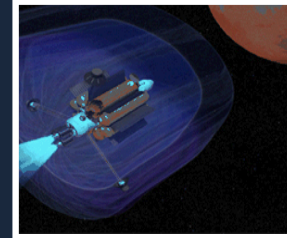
- Construction/Environmental Compliance & Restoration

Aerosciences Research for Flight in All Atmospheres



Characterization of all Atmospheres (Lasers & LIDAR)

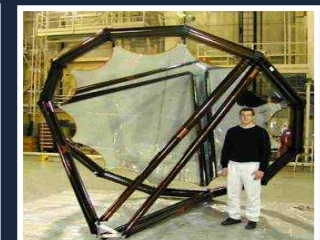
Aerospace Systems Analysis



Entry, Descent & Landing



Aerospace Structural & Material Concepts





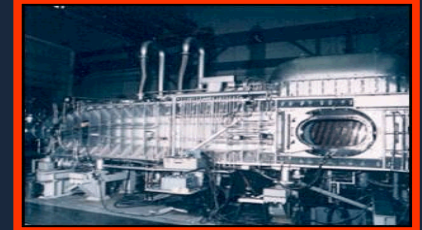
14 x 22 Foot Subsonic Tunnel
Subsonic, Alternate Uses



National Transonic Facility
High Reynolds Number Flow
Nationally Unique



**LaRC Unitary Plan
Wind Tunnel**
Supersonic Speed Range



**Aerothermodynamic
Complex**
Exploration Workhorse

Subsonic

Transonic

Supersonic

Hypersonic

***National Assets needed to meet the needs
of the Agency, DoD, and Industry***



**Flight Simulation
Facilities**



20-Foot Vertical Spin Tunnel
Spin Characteristics & Dynamic Stability
Nationally Unique



Transonic Dynamics Tunnel
Aeroelasticity & Flutter
World Unique



8-Ft High Temperature Tunnel
Large-scale Hypersonics &
Propulsion

Specialty Facilities



Fundamental Aeronautics Program

Conduct cutting-edge research that will produce innovative concepts, tools, and technologies to enable revolutionary changes for vehicles that fly in all speed regimes.

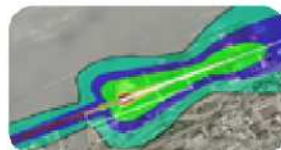
Integrated Systems Research Program

Conduct research at an integrated system-level on promising concepts and technologies and explore/assess/demonstrate the benefits in a relevant environment



Airspace Systems Program

Directly address the fundamental ATM research needs for NextGen by developing revolutionary concepts, capabilities, and technologies that will enable significant increases in the capacity, efficiency and flexibility of the NAS.



Aviation Safety Program

Conduct cutting-edge research that will produce innovative concepts, tools, and technologies to improve the intrinsic safety attributes of current and future aircraft.



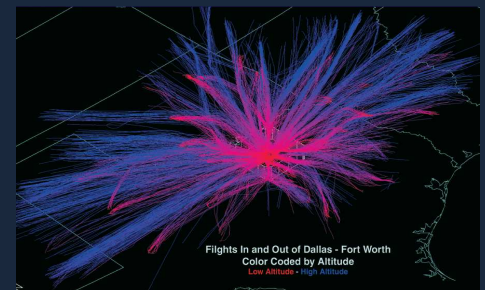
Aeronautics Test Program

Preserve and promote the testing capabilities of one of the United States' largest, most versatile and comprehensive set of flight and ground-based research facilities.

Enable NextGen from Gate-to-Gate and Reduce the Total Cost of air transportation operations

Increase Maturation and Implementation of ASP technologies to accelerate NextGen

- Concepts and Technology Development (CTD) Project:
Develop gate-to-gate concepts and technologies for NextGen to enable significant increases in capacity and efficiency
- Systems Analysis, Integration and Evaluation (SAIE) Project:
Facilitates R&D maturation of integrated concepts and technologies through evaluation in relevant environments, enabling transition to stakeholders



CTD and SAIE will deliver on collaborative work plans to accelerate products and impacts for NextGen

Overarching goal:

To conduct foundational research and develop new technologies to overcome the emerging challenges created by the nation's transition to the Next Generation Air Transportation System. The program investigates improvements to increase the inherent safety of aircraft systems and structures, ways to avoid atmospheric hazards, and develops next-generation concepts for on-board and onground safety systems.

System-Wide Safety and Assurance Technologies (SSAT) Project

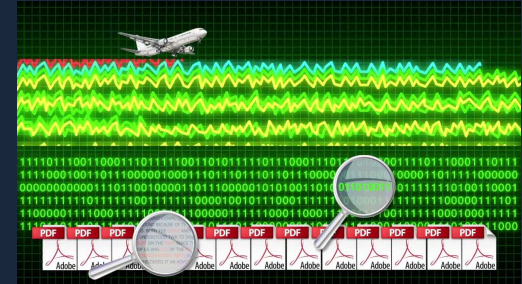
Provide knowledge, concepts, and methods to proactively manage increasing complexity in the design and operation of vehicles and the air transportation systems

Vehicle Systems Safety Technologies (VSST) Project

Identify risks and provide knowledge needed to avoid, detect, mitigate, and recover from hazardous flight conditions, and to maintain vehicle airworthiness and health

Atmospheric Environment Safety Technologies (AEST) Project

Investigate sources of risk and provide technology needed to help ensure safe flight in and around atmospheric hazards



Overarching goal:

To achieve technological capabilities necessary to overcome national challenges in air transportation including reduced noise, emissions, and fuel consumption, increased mobility through a faster means of transportation, and the ability to ascend/descend at very high speeds through atmospheres.

Subsonic Fixed Wing (SFW)

Explore and develop tools, technologies, concepts, and knowledge for improved energy efficiency and environmental compatibility for sustained growth of commercial aviation

Subsonic Rotary Wing (SRW)

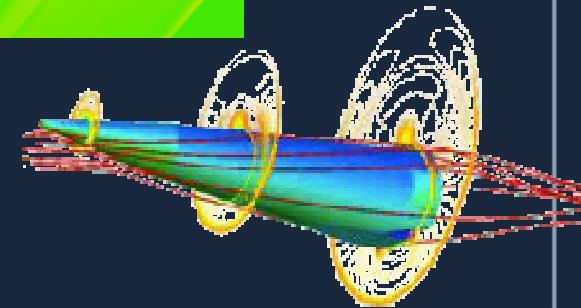
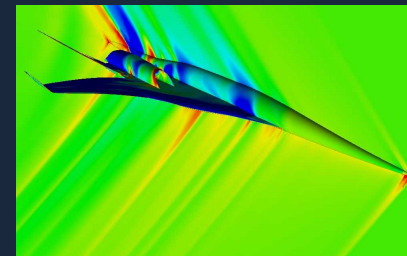
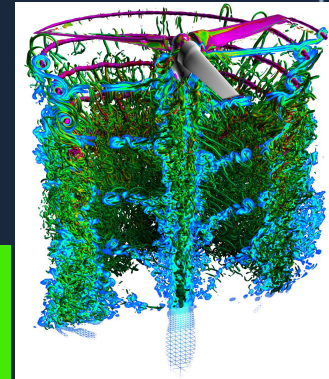
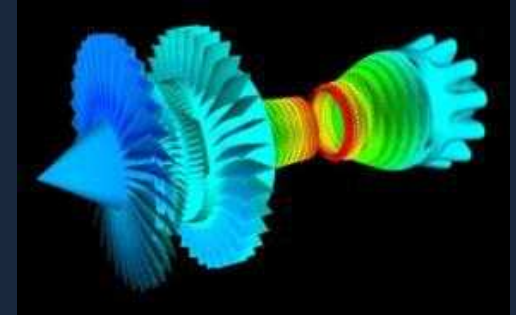
Develop tools, technologies and knowledge to enable radical changes in the transportation system through advanced rotary wing vehicle concepts and capabilities

Supersonics (SUP)

Develop tools, technologies and knowledge to overcome the environmental & performance barriers to practical civil supersonic airliners.

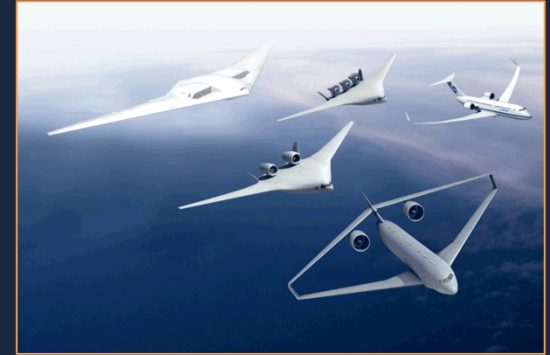
Hypersonics (HYP)

Develop tools, technologies and knowledge to enable hypersonic airbreathing vehicles and high-mass entry into planetary atmospheres.



Program Goal:

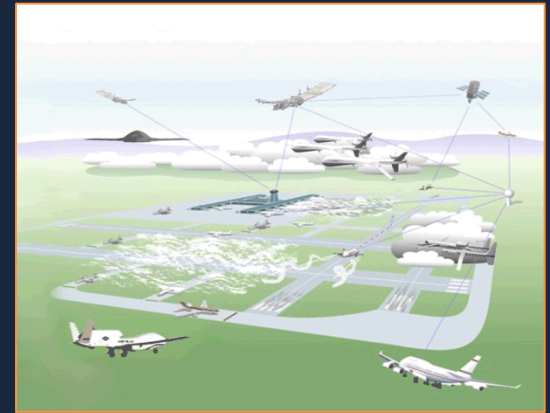
Pursue innovative solutions to high priority aeronautical needs and accelerate implementation by the aviation community through integrated system level research on promising concepts and technologies, demonstrated in a relevant environment.

***Environmentally Responsible Aviation (ERA) Project***

Mature technologies and study vehicle concepts that together can simultaneously meet the NASA Subsonic Transport System Level Metrics for noise, emissions and fuel burn in the N+2 timeframe.

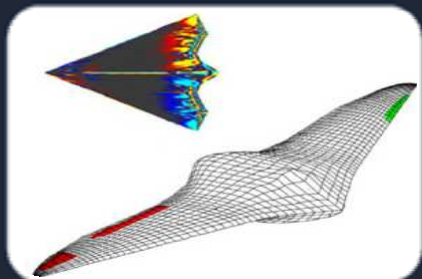
Unmanned Aircraft Systems (UAS) Integration in the National Airspace System (NAS) Project

Capitalizing on NASA's unique capabilities, the project will utilize integrated system level tests in a relevant environment to eliminate or reduce critical technical barriers of integrating Unmanned Aircraft Systems into the National Airspace System



By focusing on technologies that have already proven their merit at the fundamental research level, this program helps transition them more quickly to the aviation community, as well as inform future fundamental research needs

Aeronautical Sciences



UAS in the NAS

High-Speed



Vehicle Systems Safety
Technologies

Fixed-Wing



System-Wide Safety and
Assurance Technologies

Rotary-Wing



Atmospheric Environment
Safety Technologies



Environmentally
Responsible Aviation



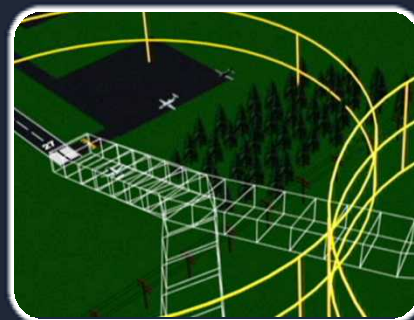
Systems Analysis,
Integration and Evaluation



Concepts and Technology
Development



Test Facilities



Goal

- Engage user and research communities to ensure progress towards the Technical Challenges and facilitate the transfer of technologies
- Leverage expertise through Interagency Agreements, Reimbursable and non-Reimbursable SAA, NASA Research Announcements

Other Government Agencies



Academia



U.S. Industry



International Organizations



