

HUMAN SPACE FLIGHT
FISCAL YEAR 2001 ESTIMATES
BUDGET SUMMARY

OFFICE OF SPACE FLIGHT

PAYLOAD AND ELV SUPPORT

SUMMARY OF RESOURCES REQUIREMENTS

	FY 1999 OPLAN <u>12/23/99</u>	FY 2000 OPLAN <u>REVISED</u>	FY 2001 PRES <u>BUDGET</u>	Page Number
	(Thousands of Dollars)			
Payload Carriers and Support.....	[39,200]	[49,300]	57,000	HSF 4-3
Expendable Launch Vehicle Mission Support	[31,500]	[30,600]	33,200	HSF 4-5
Total.....	<u>[70,700]</u>	<u>[79,900]</u>	<u>90,200</u>	
 <u>Distribution of Program Amount by Installation</u>				
Johnson Space Center	[1,400]	[1,300]	1,300	
Kennedy Space Center.....	[53,675]	[66,565]	77,600	
Marshall Space Flight Center	[525]	[3,100]	1,100	
Langley Research Center.....	[500]	[--]	--	
Goddard Space Flight Center.....	[14,600]	[8,900]	10,200	
Jet Propulsion Laboratory	[--]	[35]	--	
Total.....	<u>[70,700]</u>	<u>[79,900]</u>	<u>90,200</u>	

Note: Both of these projects were previously funded in the Payload Utilization and Operations budget line item in FY 1999 and FY 2000. Beginning in FY 2001, these projects will be funded from this new budget line item.

PROGRAM GOALS

The Payload and ELV Support comprises two projects: Payload Carriers and Support and Expendable Launch Vehicle (ELV) Mission Support. Payload Carriers and Support provides technical expertise, facilities, flight carrier hardware and capabilities necessary to perform payload buildup; test and checkout; integration and servicing of multiple payloads; transportation to the Space Shuttle; and integration and installation into the Space Shuttle.

Expendable Launch Vehicle (ELV) Mission Support has four goals. They are: (1) enhance probability of mission success and on-time cost effective launch services for NASA missions undertaken in support of NASA's strategic plan; (2) provide comprehensive advanced mission analysis and feasibility assessments for NASA payload customers; (3) increase efficiency in launch site operations and countdown management; and (4) provide low-cost secondary payload opportunities.

STRATEGY FOR ACHIEVING GOALS

The principal areas of activity in the Payload and ELV Support programs are: 1) provide safe and efficient payload preparations and launch and landing services while reducing costs of Space Shuttle-related services; and 2) provide mission planning, integration and processing for science application missions.

The Payload and ELV Support budget reflects a commitment to meet a wide array of programs ranging from science missions, flight hardware development and integration, and space flight safety projects. It also maintains an institutional base from which to perform NASA programs at reduced cost through re-engineering, consolidation and operational efficiency processes. Beginning in FY 1999, Expendable Launch Vehicle (ELV) mission support was consolidated and transferred from Earth Science and Space Science to provide more focused and efficient management of launch services to be located at the Kennedy Space Center and Cape Canaveral Air Force Base in Florida.

BASIS OF FY 2001 FUNDING REQUIREMENT

PAYLOAD CARRIERS AND SUPPORT

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
		(Thousands of Dollars)	
Payload Carriers and Support	[39,200]	[49,300]	57,000

PROGRAM GOALS

The primary goal for Payload Carriers and Support is to safely and efficiently assemble, test, checkout, service, and integrate a wide variety of Space Shuttle spacecraft and space experiments.

STRATEGY FOR ACHIEVING GOALS

The Payload Carriers and Support program provides the technical expertise, facilities and capabilities necessary to perform payload buildup; test and checkout; integration and servicing of multiple payloads; transportation to the launch vehicle; and integration and installation into the launch vehicle. This program also includes operational efficiencies gained to date, as well as additional anticipated efficiencies to reduce cost and improve customer satisfaction. Efficiencies already in place have reduced processing time and error rate.

Payload Carriers and Support also funds smaller secondary payloads like the Get-Away Specials (GAS) and Hitchhiker payloads. The GAS payloads are research experiments that are flown in standard canisters, which can fit either on the sidewall of the cargo bay or across the bay on the GAS bridge. They are the simplest of the small payloads with limited electrical and mechanical interfaces. Approximately 155 GAS payloads have been flown. The Hitchhiker payloads are the more complex of the smaller payloads, and provide opportunities for larger, more sophisticated experiments. The Hitchhiker system employs two carrier configurations: (1) a configuration on the orbiter payload bay sidewall and (2) a configuration across the payload bay using a multi-purpose experiment support structure (MPESS). During the mission, the Hitchhiker payloads can be controlled and data can be received using the aft flight deck computer/standard switch panels or from the ground through the payload operations control center (POCC).

Payload analytical integration is the responsibility of the Payload Projects Office at the Marshall Space Flight Center (MSFC), and supported by a contract with Boeing. Physical payload integration and processing is the responsibility of the Payload Management and Operations Office at the KSC, and also supported by a contract with Boeing.

Another item funded in Payload Carriers and Support is the Flight Support System (FSS). The FSS consists of three standard cradles with berthing and pointing systems along with avionics. It is used for on-orbit maintenance, repair, and retrieval of spacecraft. The FSS is used on the Hubble Space Telescope (HST) repair/revisit missions.

MEASURES OF PERFORMANCE

	FY 1999		FY 2000		FY 2001
	<u>Plan</u>	<u>Actual</u>	<u>Plan</u>	<u>Revised</u>	<u>Plan</u>
<u>Missions Supported</u>					
Space Shuttle Missions	[6]	[4]	[8]	[6]	9
Hitchhiker Experiments, includes CAP/SEM/HH Jr.	[13]	[12]	[4-6]	[2]	7
Get-Away Special Payloads	[5]	[5]	[10-20]	[0]	2
Spacehab Missions	[2]	[2]	[--]	[1]	1
Other Major Payloads	[8]	[6]	[8]	[6]	13
Other Secondary Payloads	[34]	[26]	[--]	[7]	1
Multi-Purpose Experiment Support Structure (MPRESS)					--
Pallets	[2]	[0]	[8]	[3]	5
<u>Number of Payload Facilities Operating at KSC</u>	[6]	[6]	[6]	[5]	5
<u>KSC Payload Ground Operations (PGOC) Workforce</u>	[360]	[366]	[334]	[308]	334

ACCOMPLISHMENTS AND PLANS

In FY 2001, Payload Carriers and Support will provide pallets, integration and testing support activities for HST Servicing Mission 3B. Launch and landing payload support activities include 9 planned Space Shuttle Missions, encompassing payload processing support activities and facilities for 13 major payloads, including 6 ISS assembly and utilization flights. Funding also provides operations and maintenance of Payload Facilities at KSC. It is planned that reimbursable funds of \$1,155,000 will be received in FY 2001 to cover processing costs for GAS and Hitchhiker payloads.

BASIS OF FY 2001 FUNDING REQUIREMENT

EXPENDABLE LAUNCH VEHICLE SUPPORT

	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>
		(Thousands of Dollars)	
Expendable Launch Vehicle Support	[31,500]	[30,600]	33,200

PROGRAM GOALS

The goals of the Expendable Launch Vehicle (ELV) mission support program are to: (1) enhance probability of mission success and on-time cost effective launch services for NASA missions undertaken in support of NASA's strategic plan; (2) provide comprehensive advanced mission analysis and feasibility assessments for NASA payload customers; (3) increase efficiency in launch site operations and countdown management; and (4) provide low-cost secondary payload opportunities.

STRATEGY FOR ACHIEVING GOALS

NASA has consolidated ELV management and acquisition of launch services at Kennedy Space Center (KSC). Effective in FY 1999, all funding for mission support was transitioned from the Office of Space Science and the Office of Earth Science to the Office of Space Flight, consistent with assignment of responsibility for ELV management to OSF.

KSC is responsible for acquiring requisite launch services to meet all Enterprise requirements and for increasing the probability of mission success through focused technical oversight of commercially provided launch services. A core team of civil servants and contractors primarily located at KSC performs the technical management. KSC personnel are also resident at key launch sites, launch facilities and customer facilities. NASA personnel are resident at Vandenberg AFB in California where all launches into a polar orbit, such as those required by the Earth Science Enterprise, are conducted. Resident office personnel are located in launch service contractor plants, specifically, the Lockheed Martin Corporation Atlas Centaur plant in Denver and the Boeing Corporation Delta plant in Huntington Beach, California. KSC customer offices have been established at GSFC and JPL as the centers assigned program management responsibility for the majority of Space Science and Earth Science missions requiring access to space via NASA-provided launch services.

Advanced mission design/analysis and leading edge integration services are provided for the full range of NASA missions under consideration for launch on ELV's. Technical launch vehicle support is provided in the development and evaluation of spacecraft Announcement of Opportunities, to enable cost effective consideration of launch service options and technical compatibility. Early definition of vehicle requirements enables smooth transition to launch service and an excellent cost containment strategy.

Launch site operations and countdown management is being improved through the use of a consolidated launch team, efficient telemetry systems, and close partnership with Boeing and the USAF to assure lowest cost west coast Delta launch complex operations.

NASA's ELV secondary payload program enables efficient use of excess vehicle performance on selected NASA, USAF and commercial missions through funding integration of small secondary payloads. These payloads are sponsored by university research institutions and often international cooperatives which can take advantage of available limited excess space and performance on launch vehicles and accept the primary payload's launch schedule and orbit. NASA has developed a standard Delta secondary launch vehicle capability and has similar discussions under way with other US ELV providers.

MEASURES OF PERFORMANCE

<u>Missions Supported</u>	<u>FY 1999</u>		<u>FY 2000</u>		<u>FY 2001</u>
	<u>Plan</u>	<u>Actual</u>	<u>Plan</u>	<u>Revised</u>	<u>Plan</u>
ELV Missions	[13]	[10]	[8]	[9]	11
Secondary Payloads	[3]	[1]	[3]	[5]	1

ACCOMPLISHMENTS AND PLANS

Two launch services competitions are supported in this request. In FY 2000, the NASA Launch Services (NLS) procurement for purchasing launch services for future NASA missions – including potential Space Station re-supply missions– will be competed. This contract provides for awards to multiple contractors with vehicles with demonstrated flight history. Also, the Next Generation Launch Services (NGLS) contracts will be competed. NGLS will enable emerging launch services companies, with little or no flight history, to compete for offering launch services to NASA. The NLS NGLS procurements, in addition to the existing Small ELV (SELV) contracts will be used for the Alternative Access element of the Space Launch Initiative, for which funding begins in FY 2001 in the SAT account. Alternative Access funding is intended to enable NASA to establish and use alternative means of access to space – primarily to the International Space Station. These funds will be used to purchase services, however, in the near-term they may support technology development or operational technology demonstrations to help enable near term commercial launch systems that could service space station or launch NASA science payloads. Alternative access could provide important benefits, including contingency capability, operational flexibility, increased competition, near-term flight opportunities, and development of capabilities to meet station-unique needs. The OSF ELV Program will work closely with OAST on Alternative Access and NASA envisions that funding for Alternative Access may be transferred from the SAT account to the HSF account in the future.

In FY 2001, the ELV Sustaining effort will support launch site maintenance and sustaining operations at Vandenberg AFB and Cape Canaveral Air Station. It will also support technical insight across all launch vehicle classes (Small, Med-Lite, Medium, & Intermediate), and support for 11 missions (including GENESIS, Mars Orbiter, TIMED/JASON, ICESAT/CATSAT, NOAA-M, GALEX) and 1 secondary payload (IMEX) to be launched in FY 2001. This also supports the assessment of necessary modification and/or replacement of the NASA Operations Center at Vandenberg Air Force Base, CA.