

# Slowdown in Space Programs: Its Impact on the Southeast

Nearly a decade of intensive preparation for a manned lunar flight by the National Aeronautics and Space Administration (NASA) provided an almost magic formula for vitalizing the local economy of several communities in the Southeastern region of the country. Huntsville, Alabama; Cape Kennedy, Florida; and the Bay St. Louis-Pearlington-Picayune area (Hancock County, Mississippi) have all undergone fundamental changes in their economic structures and have experienced phenomenal growth in population, employment, and income from the advent of large-scale NASA operations. For instance, in the short period between 1960 and 1965, almost all key economic indicators doubled in Huntsville—once a declining textile town. Her population grew by as much as 90 percent, the employment level rose about 95 percent, and per capita income rose faster than Alabama's. Experiences of Cape Kennedy and Hancock County, Mississippi, during this period matched, if not surpassed, the Huntsville experience.

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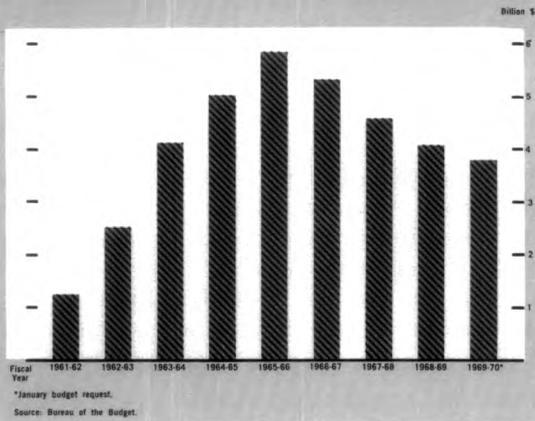
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Effects of the NASA operations in New Orleans were less dramatic; but the opening of the NASA Michoud Assembly Facility in 1962 provided enough expansionary stimulus in New Orleans to reverse the downward employment trend of the five preceding years. For the Southeastern region as a whole, the employment build-up by NASA during the 1962-64 period accounted for about one-third of the annual net increase in the region's total manufacturing employment.

Constraints on the nation's space spending began to take place in fiscal 1966-67 when NASA's space budget was reduced to \$5.3 billion from the previous year's record budget of \$5.9 billion (on an expenditure basis). Subsequently, the NASA budget was gradually cut back to \$3.8 billion for the 1969-70 fiscal year—about a 30 percent decline from the peak in 1965. A reduction of this magnitude is bound to affect the economy of the region in general and that of individual space communities in particular. This article traces the economic aspect of regional impacts that resulted from the nation's relaxed space exploration programs.

There is little doubt that funding priority for the Vietnam war has accentuated the magnitude of the reduction. But, even without the Vietnam

**The nation's NASA space budget expenditures have declined since 1965-66.**



military build-up, some contraction in overall space programs would have been almost inevitable. First, the initial spurt of space expenditures for construction of plants, buildings, test structures, and procurement of equipment had been felt by 1965, and the basic design and fabrication works needed for the Apollo program (manned lunar flight program) had been nearly completed by late 1966. Secondly, the budget cutbacks stem, in large measure, from the absence of positive long-run goals of the country for space exploration after the Apollo program. This was essentially a short-run crash program, and the country has not yet established the national priority for the post-Apollo programs over other national goals. Consequently, NASA recently has been concentrating on the Apollo Applications Program which is in essence a follow-up on a limited scale to the manned lunar flight program.

Nationally, the impact of the reduction in space spending is reflected in a drastic shrinkage in space employment; the present space industry employment is estimated to be about 200,000, about half of that reached during the 1965-66 peak period. On the whole, the Southeast's total space employment (i.e., civil service employees of NASA and private contractor employees) did not decline as much as that for the nation. The region's total space employment reached a peak of 55,600 in 1965 and was down to 49,700 at the end of 1968—a 12-percent decline. During the same period, the region lost only \$15 million in space payroll income. Considering the secondary ripple effects of income, the \$15-million decline in space income might have depressed the region's total personal income by about \$30 to \$45 million last year. However, it is significant to note that the share of space employment in the

region's total manufacturing employment decreased to 2.7 percent in 1968 from the peak of 3.1 percent in 1966-67.

The overall economic impact of the reduced space program so far has been relatively moderate for the region as a whole. However, the impacts on the individual communities have been varied in timing and degree. This is because each space installation carries out a different function, and because the importance of NASA operations in each area is unequal.

### Direct Employment Effects

**Michoud Assembly Facility, New Orleans.** The Michoud Facility in New Orleans—manufacturing site of Saturn rockets—was the first space installation in the region to feel the pinch of the nation's relaxed space efforts. The number of NASA and private contractor employees was reduced to 6,200 by the end of 1968 from the peak of 12,000 in May 1965. While this nearly 50-percent decrease in the working force reflects a rapid contraction in Michoud activity, an even more dramatic turn of Michoud operations is reflected in the drastic reduction in space contracts awarded by the Michoud Facility between 1965 and 1966. In 1965, Michoud awarded a record \$352 million to private space contractors (including construction contractors). In the following year, the comparable figure shrank to \$173 million, nearly a 50-percent decline in a single year. This drastic contraction contrasts with a fractional reduction (about 1.4 percent) that occurred in the total NASA space budget during the same period. This suggests that the decline in the Michoud Facility's working force since 1965 reflects not so much a primary impact from the recent cut in the nation's space budget, but that the redirection of the nation's space efforts seems to focus upon research and development of post-Apollo programs rather than the manufacturing of Saturn rocket boosters.

In terms of the actual number of jobs that NASA provided in the total nonagricultural labor force of New Orleans, the Michoud employment—both civil service and private contractor employees combined—appears relatively insignificant. In May 1965, when peak employment was reached at Michoud, it accounted for only 3.7 percent of New Orleans' nonfarm jobs, and last year the share declined to a mere 1.7 percent. However, when the growth pattern of New Orleans' nonagricultural employment since 1950 is closely scrutinized, NASA activities at Michoud emerge as having exerted a rather substantial in-

fluence on the growth of the New Orleans economy.

Until NASA reactivated the Michoud Facility in late 1961, New Orleans' total nonfarm employment had been growing at a rather slow rate of 1.8 percent per year for the preceding decade. However, in 1963, about one year after the plants were reopened, the growth rate of New Orleans' nonfarm employment jumped from 1.2 to 3.7 percent. When the NASA build-up was at its peak in 1964, the city's nonfarm employment rose by the post-World War II record of 8.5 percent. Since then, as the peak of the Michoud operations has passed, New Orleans' nonfarm job increases have decelerated correspondingly. In 1967, the city registered only a nominal growth of 1.2 percent in her nonfarm jobs. Last year the increase shrank to a mere .9 percent. However, two years' experience is not long enough to conclude that the New Orleans economy has relapsed to the pre-NASA period of economic sluggishness.

There may be various factors other than the appreciable cut in the Michoud operations since 1965 that have contributed to the concurrent sluggishness in the New Orleans economy. But one thing seems to stand out clearly: Unlike many other communities that hosted the nation's major space installations (where private space contractors have chosen to expand and diversify locally or the local space activities have attracted so-called spin-off industries or nonspace industries), NASA operations at Michoud seem to have given only peripheral effects to the New Orleans economy.

**Cape Kennedy, Florida.** The situation at the Kennedy Space Center has been different from the Michoud experience. Between 1963 and 1967, the total number of NASA and private contractor

employees increased from 6,200 to 26,300—a whopping 330-percent increase. The share of NASA and space contractor employment to Brevard County's total nonfarm jobs increased from 12 percent in 1963 to 31 percent in 1967. The share declined to 30 percent last year. Between 1963 and 1967, payrolls rose from \$36.7 million to \$292.8 million. Even though space employment at Cape Kennedy declined slightly in 1968, payroll income disbursed by the Kennedy Center increased to \$324 million. However, this payroll increase is the smallest annual increase, in absolute and relative terms, that the Kennedy Center has registered since it began operations in 1962.

Reduction in space employment at Cape Kennedy has been very small, largely because of the unique roles and functions that the Center performs in the space program. The Cape is the site of the final assembly and launching of the rockets that were manufactured elsewhere. Thus, the Cape is at the end of the space program "pipeline," and is where the nation's space technology and efforts culminate. Consequently, the recent reduction in space spending has not yet affected the Cape as much as other centers where major design works are performed or space hardwares are fabricated, such as Michoud.

Another factor that so far has cushioned a decline in the work force at the Kennedy Space Center is rapid job increases in the launch operations. These have more than offset considerable declines in construction workers since 1965.

**Huntsville, Alabama.** The Marshall Space Flight Center, one of the nation's key space installations, performs, under the direction of Dr. Werner von Braun, basic design and develop-

Table I  
Region's<sup>1</sup> Space Employment

	1963	1964	1965	1966	1967	1968
Kennedy Space Center <sup>2</sup>	6,157	11,145	16,529	22,583	26,296	25,912
Marshall Space Flight Center <sup>3</sup>	12,500	15,500	16,900	17,900	18,500	14,900
Michoud Assembly Facility <sup>4</sup>	9,038	11,485	10,644	9,264	7,984	6,166
Mississippi Test Facility	n.a.	2,477	4,794	4,410	2,848	2,744
Space Total	27,695	40,607	48,867	54,157	55,628	49,722
Share of Total Space Employment in the Region's Manufacturing Employment (in percent)	1.9	2.7	3.0	3.1	3.1	2.7

n.a.—Not available.

<sup>1</sup>Sixth District States (Alabama, Florida, Georgia, Louisiana, Mississippi and Tennessee).

<sup>2</sup>Includes Federal employees, aerospace contractor employees, construction workers, and Air Force support.

<sup>3</sup>Includes Federal employees and contractors.

<sup>4</sup>Construction contractor personnel not included.

Sources: NASA, U. S. Department of Labor (BLS), and individual state department of labor offices.

Table II  
Share of Space Employment in Local Nonfarm Employment  
(in Percent)

Space Center	Area	1963	1964	1965	1966	1967	1968
Kennedy	Brevard County	12.0	17.6	23.7	28.6	31.2	30.1
Marshall	Huntsville	20.5	22.3	22.1	22.3	23.8	19.6
Michoud	New Orleans	3.0	3.6	3.1	2.6	2.2	1.7
MTF	Hancock County	n.a.	70.4	77.7	55.7	35.8	41.8

n.a.—Not available

Sources: NASA, U. S. Department of Labor (BLS), and individual state department of labor offices.

ment of the launch vehicles for the Apollo project—in addition to some fabrication of sophisticated space hardware. The important role that the Marshall Center plays in the nation's space program is amply attested to by the huge amount of contract awards administered by or through the Center. When the country's space spending reached the plateau in 1965 and 1966, the Center awarded about \$1.6 billion worth of space contracts annually (on an obligational authority basis), or about 30 percent of the total NASA budget during the corresponding period.

Space employment at the Marshall Center reached its peak in 1967 when combined NASA and private contractor employees totalled 18,500. Since December 1967, the Center has lost a total of approximately 3,600 space engineers, technicians, and other supporting workers.

With NASA and Army Missile Command operations in the area, the Huntsville economy is heavily dependent upon Federal spending. In 1967, NASA and its contractor employees constituted about one-fourth of Huntsville's non-agricultural employment. In 1968, the share shrank to one-fifth.

Last year's reduction in space employment had mildly depressing effects on the local employment and business situations. Total nonfarm employment declined, unemployment rose, and the real estate market was especially depressed by the exodus of space contractors and their employees. It was fortunate for Huntsville to have the nearby newly established Sentinel Anti-Ballistic Missile Agency and Army Missile Command, which absorbed a part of the workers released by NASA last year. However, the new jobs at these agencies in many cases were production-oriented so that Huntsville lost a high proportion of its top caliber space engineers.

Although the local job market situation has reportedly improved, the housing market is still recovering from last year's depressed level. However, in view of other evidence, such as an in-

crease in public school enrollment last year, the depressed real estate market seems to reflect not an excess of overall housing capacity but an excess of certain high-priced houses and apartments. These are no longer in great demand after the exodus of the relatively affluent space contractor employees.

**Mississippi Test Facility.** Because of the mission that Mississippi Test Facility (MTF) carries out—static test-firing of launch vehicles—the site of MTF was deliberately chosen in a sparsely populated area of Hancock County, Mississippi, where rockets can be shipped by waterways. NASA has spent an aggregate amount of \$340 million for acquisition of land, construction of buildings and testing structures, a water navigation system, and procurement of equipment. The construction of the site began in 1963 and was completed in 1966. When construction activities were at their peak, MTF provided about 4,800 workers, accounting for about 78 percent of nonagricultural jobs in Hancock County. The combined NASA and supporting private contractor employees at the end of 1968 was 2,700, and the share of the space employment to the county's total nonagricultural jobs declined to about 42 percent.

This decline in employment is undoubtedly quite dramatic. While it was accentuated by the recent reduction in space spending, it was largely attributable to the completion of initial construction works required for the testing facilities, rather than to the reduced space budget per se. Whatever the original sources for the slackened employment, this drastic change in MTF employment in such a short span of time was not without some adverse economic repercussions to the areas surrounding the MTF.

While MTF employment was rapidly climbing, housing and apartment construction mushroomed, and school facilities, water, and sewer systems needed to expand. For instance, the first com-

munity sewerage system ever installed in the county was installed in a large residential subdivision in Pearlinton which was developed during the period when MTF construction activities were at their peak. There now reportedly exists an excess supply of housing in the communities surrounding the MTF. The local governments in the area have reportedly incurred a substantial amount of debt in order to expand their schools and public utilities to meet the increased demand arising from the influx of space-related workers. On the basis of the known NASA program, there is little doubt that MTF has seen the peak of its employment.

### Secondary Effects

The reduction in space spending is bound to produce ripple effects that go beyond the initial cutback in space spending. That is, initial reduction in NASA procurement of goods and services will decrease overall regional income more than the original reduction in the expenditures by the individual NASA installations—unless it is offset by an increase in other autonomous government or private spending. The process of the ripple effects can be explained as follows: Initially, the reduced NASA expenditures are borne by NASA and its contractors who reduce their work forces. The individuals laid off from space works reduce their spending on a variety of goods and services produced locally, thus creating downward pressures on the local employment and income levels. In turn, the affected local workers spend less, and their reduced spending will further lower local employment and income. The results of this process are often called “negative multiplier effects.”

Empirically, it is difficult to measure the regional effects of this negative income multiplier for various reasons. First, the complexity of the nation's aerospace industry structure makes it difficult to measure the magnitude of NASA contract and subcontract work that shifts from state to state. NASA contracts awarded to firms in the Southeast may actually be produced by subcontractors in other regions. Conversely, NASA prime contracts given to firms in other regions may be done by subcontractors in the Southeast. In this respect, the best available statistics that can be used to estimate the effects of reduced space spending on the local economy seem to be the subsequent changes in NASA payroll data (civil service and contractor employee payrolls) at the individual space centers.

Secondly, even if we use the payroll data as reflecting the primary decline in space income, secondary effects of the reduced space income on total regional income are difficult to ascertain. Either the local trade figures or trade relationships between different regions are poor or non-existent. At any rate, with the exception of New Orleans, which has a broadly diversified economic base, there may be no significant ripple effects. The ripple income effects in Huntsville, Cape Kennedy, and Hancock County, if any, probably have been confined to minor declines in local trade and service employment, as these areas have very narrowly diversified economic bases.

What we do know is that the four space centers in the region have lost a substantial amount of payroll income. Huntsville experienced a net loss in space payrolls of about \$40 million in 1968. Michoud has lost a cumulative total of \$53 million in a four-year period since 1965, and Hancock County a total of \$18 million in the three-year period since 1966. As of the end of 1968, the Cape Kennedy payroll was still increasing on an annual basis. With the exception of 1968, net gains at the Cape during the last several years more than offset the net loss of space payrolls at Michoud and Hancock.

The Southeastern region as a whole experienced, for the first time, a net loss of \$25.3 million in space payrolls last year. Because of a broader economic base of the region, it may be reasonable to assume that this net loss might have depressed the overall personal income of the region by 2 to 3 times the original base, or about \$51-\$76 million last year. On the surface, this reduction in total personal income appears relatively insignificant. However, it should be pointed out that the region did benefit from the positive multiplier effects of the accelerated increase in space payrolls during the 1962-67 period. A rough estimate shows that during this same period the region probably added about \$290 million annually to its total income from the net increase in space payrolls and its income multiplier effect. Under these circumstances, the loss of the net space income and its secondary income last year was undoubtedly considerable.

### Prospects

On the basis of NASA's known post-Apollo manned flight program (called the Apollo Applications Program), further reduction in the Southeast's space employment seems almost unavoidable. The President's January budget request for fiscal 1969-70 shows another \$300-mil-

Table III  
Space Payrolls and Region's<sup>1</sup> Wages and Salaries  
(in Millions of Dollars)

	1963	1964	1965	1966	1967	1968
Kennedy Space Center <sup>2</sup>	36.7	62.2	109.2	207.3	292.8	323.9
Marshall Space Flight Center	134.0	187.0	214.0	232.0	248.0	209.0
Michoud Assembly Facility	56.9	87.3	96.4	85.5	76.8	68.0
Mississippi Test Facility	n.a.	19.4	53.3	55.5	42.3	33.7
Total Space Payrolls	227.6	355.9	472.9	580.3	659.9	634.6
Share of Total Space Payrolls in Region's Total Wages and Salaries (in percent)	.9	1.2	1.5	1.6	1.7	n.a.
Share of Total Space Payrolls in Region's Manufacturing Wages and Salaries (in percent)	3.4	4.9	5.7	6.2	6.6	n.a.
n.a.—Not available.						
<sup>1</sup> Sixth District States (Alabama, Florida, Georgia, Louisiana, Mississippi, and Tennessee).						
<sup>2</sup> Includes only Federal employees and aerospace contractor employees.						
Sources: NASA and Office of Business Economics, U. S. Department of Commerce.						

lion decrease in NASA's space budget from the previous appropriation of \$4.1 billion (on an expenditure basis). Largely because of this budgetary restriction, it appears that NASA will have to continue taking holding action that mainly concerns development of the so-called flexible "Core Program" which can be readily expanded as needed funds become available. At the current rate of reduction in the NASA space program, a rough estimate indicates that the Southeast's space employment may go down to a 40-42,000-level this year from 49,700 of last year, and to a 30-33,000-level by mid-1971. Beyond 1971, barring a drastic Congressional cut in space appropriation, it is likely that the region's space jobs will be stabilized at the level estimated for mid-1971.

**New Orleans.** At Michoud, some of the Saturn rockets manufactured there have already been put into mothballs for future use. Informed sources estimate that Michoud employment may go down to 3,700 by the end of this year and to 1,700 by mid-1971. It is projected by the same sources that some modification and refurbishing will probably be performed on the mothballed rockets in 1972-73, and employment may go up to about the 3,000-level during this period.

However, unless NASA decides to procure additional Saturn rockets or other basic launch boosters after fiscal 1970-71, NASA operations at Michoud may have to phase out.

**Cape Kennedy.** Because Cape Kennedy is the launching site of the nation's space program, activity at the Kennedy Space Center will be

affected primarily by the number of future space launchings. NASA officials visualize a gradual decrease in overall space employment at the Cape—a decrease due not so much to the reduction in space funding, but to the reduced needs for space contractor workers as a result of increases in their work efficiency. But if, as is being speculated, the number of launches is going to be stretched out to two or three a year as compared to an average of five a year in recent years, the Cape also will, in all probability, have to undergo appreciable reductions in its work force. Should this happen, the Cape Kennedy area will probably lose a substantial number of high-paying jobs that cannot be easily replaced. One factor that may mitigate the possible reduction of production workers at the Cape is the Air Force missile operations at nearby Patrick Air Force Base. In contrast to the downward trend of NASA budgets since 1965, aerospace expenditures by the Department of Defense have been gradually accelerating since 1965 (\$1.5 billion in 1965 to \$2.1 billion in fiscal 1968-69). While it is not certain whether the Patrick Base operation will be expanded, the present level of the Base operations may be sustained for the next several years.

There is a possibility that a rapid increase in private employment in the future may absorb some of the workers who might be laid off by space contractors (if further reduction in space contract works occurs). In recent years, there has been a rather impressive growth in manufacturing employment in the Cape area. Most of the growth is attributable to increases in space-related or "spin-off" industries such as nonspace precision industries. Major space contractors like Chrysler,

General Electric, and McDonnell-Douglas have established service and manufacturing facilities in the area either to support the space effort or as an outgrowth of their active operations in the Kennedy Space Center. In addition, a number of nonspace industries also have recently established production facilities in the area.

**Huntsville.** The Marshall Space Flight Center is also slated to experience further slackening in its work force in the near future. However, future cutback in space employment and its overall impact on space-related employment in the Huntsville area, in all probability, will be gradual and moderate. The Center is currently deeply involved in the development and fabrication of highly sophisticated space hardwares such as the Orbital Workshop mission and the Apollo Telescope Mount mission, which form the nucleus of NASA's Apollo Applications Program.

Furthermore, expected increases in the Department of Defense expenditures on the missile system, which may increase employment at the nearby Army Missile Agencies, may give some cushion against the adverse impacts of the reduced NASA activities in Huntsville's area. In addition, concerted efforts of the local community have been quite successful in inducing nonspace-related private industries into the area. Within the past few years, five large national firms announced their plans of plant locations in Huntsville. The five firms, which will eventually create about 4,200 new jobs, are Automatic Electric Company, Barber Coleman, PPG Industries, Dunlop Tire and Rubber, and U. S. Corrugated-Fiber Box Company.

**Hancock County.** Operations at Mississippi Test Facility will probably undergo a sizable reduction in the near future as the number of test-firings needed declines. At present, NASA officials project a further employment decline to a 2,100-level by the end of this year. Citizens of Hancock County, in cooperation with regional planning bodies, are working hard to create sustained economic growth of the area by opening up new industrial port and harbor facilities. When highway I-10, now near completion, connects the surrounding communities, the area will likely get some expansionary impacts if new plants and industries locate in the area. Should that happen, the presently underutilized housing, school, and public utilities will be ready to support future growth of the local economy.

**The Region.** At the regional level, the cutback in space jobs, if it materializes, will be less painful than at the individual community level. The severity of the future adjustment process that the affected individual communities may experience is difficult to predict; many diverse factors are involved in determining a local economy's adaptability to change.

### Conclusion

Recent contractions in the nation's space program have already imposed varying degrees of adverse economic impact on the local economies of the region's space centers. Such impacts are likely to be accentuated in the near future unless the space program gets reinvigorated soon. Understandably, the local communities where the space centers are located would welcome a step-up in NASA spending because the vitality of the space programs affect the economic life of their communities.

A crucial issue is whether this country should relax its space exploration at this stage. There are some who appear to believe that space exploration is a frill when there are pressing needs for funds to combat the nation's social and urban problems. Others, though conscious of the latter needs, believe that space exploration must continue because preservation of the national security—and possibly western civilization as well—is at stake.

Despite its spectacular achievement in space, the United States has barely begun to tackle the hostile environment of space and of harnessing space knowledge for the betterment of mankind. Whether we should or should not relax our future space endeavors hinges on the determination of the national priority of space exploration over various competing national goals, and this involves more than narrow economic considerations.

C. S. PYUN

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## Bank Announcements

On April 1, two nonmember banks—**Ashburn Bank**, Ashburn, Georgia, and **Merchants & Citizens Bank**, McRae, Georgia—began to remit at par.

Another nonmember bank, **The Citizens Bank of Ashburn**, Ashburn, Georgia, also began to remit at par on April 7.

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