

outcomes depend on the environment, and on the budget process as well as individual strategies. Individual strategies have to be framed in a broader context than simply perceived self-interest.

Budgeting is not well described as an annual process with little change from year to year. Budgetary decision making changes over time: interest group power waxes and wanes, competition in the budget increases and decreases, and the budget process itself varies over time. Changes in process take place in response to individuals, committees, and branches of government jockeying for power; in response to changes in the environment from rich to lean, or vice versa; in response to changes in the power of interest groups; and in response to scandals or excesses of various kinds.

Notes

1. Patricia Ingraham and Charles Barilleaux, "Motivating Government Managers for Retrenchment: Some Possible Lessons from the Senior Executive Service," *Public Administration Review* 43, no. 3 (1983): 393-402. They cite the Office of Personnel Management Federal Employee Attitude Surveys of 1979 and 1980, extracting responses from those in the Senior Executive Service, the upper ranks of the civil service and appointed administrators. In 1979, 99 percent of the senior executives said that they considered accomplishing something worthwhile to be very important; 97 percent said the same in 1980. By contrast, in response to the question "How much would you be motivated by a cash award," only 45 percent said either to a great extent or a very great extent.
2. Twelve percent of LeLoup and Moreland's Department of Agriculture requests between 1946 and 1971 were for decreases. See Lance LeLoup, *Budgetary Politics*, 3rd ed. (Brunswick, Ohio: King's Court, 1986), 83. For a more recent case study of an agency requesting decreases, see the case study of the Office of Personnel Management, in Irene Rubin, *Shrinking the Federal Government* (White Plains: Longman, 1985). See Irene Rubin,

Running in the Red: The Political Dynamics of Urban Fiscal Stress (Albany: State University of New York Press, 1982) for an example of a department refusing additional employees.

3. For a good discussion of this phenomenon, see Frank Thompson, *The Politics of Personnel in the City* (Berkeley: University of California Press, 1975).
4. See Rubin, *Shrinking the Federal Government*, for examples during the Reagan administration.
5. U.S. Senate, Committee on Governmental Affairs, *Office of Management and Budget: Evolving Roles and Future Issues*, Committee Print 99-134, 99th Cong., 2nd sess., prepared by the Congressional Research Service of the Library of Congress, February 1986.
6. See, for example, Kenneth Shepsle and Barry Weingast, "Legislative Politics and Budget Outcomes," in *Federal Budget Policy in the 1980s*, Gregory Mills and John Palmer, eds. (Washington, D.C.: Urban Institute Press, 1984), 343-367.
7. Rubin, *Running in the Red*, 56.
8. For a vivid account of the relationship between pork-barrel spending and building political coalitions, see Martin Shefter, "New York City's Fiscal Crisis: The Politics of Inflation and Retrenchment," *Public Interest* 48 (Summer 1977): 99-127.
9. See John Ellwood, "Comments," in Mills and Palmer, *Federal Budget Policy in the 1980s*, 368-378.
10. Douglas Arnold, "The Local Roots of Domestic Policy," in *The New Congress*, Thomas Mann and Norman Ornstein, eds. (Washington, D.C.: American Enterprise Institute, 1981), 252, quoted by Ellwood, in Mills and Palmer.
11. Arnold, "Local Roots," 282.
12. Ellwood, in Mills and Palmer, 370.
13. Linda Harriman and Jeffrey Straussman, "Do Judges Determine Budget Decisions? Federal Court Decisions in Prison Reform and State Spending for Corrections," *Public Administration Review* 43, no. 4 (1983): 343-351.

CASE STUDY 12

Introduction

Perhaps nothing is more vital to our understanding of public administration than how monies are budgeted to achieve public purposes. This subject, many believe, directly and decisively influences what policies are pursued and how management of public programs is achieved. For some, budgets in reality are what public administration is all about, namely the translation of public purposes into practical actions through the raising and expenditures of government monies. Rubin's foregoing essay therefore offers several stimulating insights into this critical process. It especially shows why this subject should not be viewed as merely a dry, technical document but as something that affects the central fabric of modern democratic society and the choices it faces.

Let us next turn to an actual contemporary case related to Professor Rubin's conceptualization of public budgeting. Over the last four decades or more, all levels of U.S. government have relied increasingly upon contracts with private, nonprofit, even other public entities to deliver goods and services for citizens. The sheer numbers of contractors and subcontractors, the immense size of funding, as well as the growing complexity and length of time involved with completing such contracts impose enormous challenges for public budgeting, especially for ensuring effective programmatic oversight and efficient, timely implementation. A noteworthy current example of this difficult budgetary dilemma is found in the following case, "Death of a Spy Satellite Program," by *New York Times* investigative reporter Philip Taubman. The author recounts the lengthy development and recent demise of the Future Imagery Architecture project (FIA), the most advanced spy satellite project to date, yet resulting in the most expensive loss in the fifty-year history of America's spy satellite program. This fascinating story highlights the complicated problems that contracting-out creates at every stage of the five-part public budgeting process which Rubin's foregoing essay outlines, i.e., the revenue process (how much money will be available?); the budget process (who participates in budget choices?); the expenditure process (which budget choices will be made?); the balance cluster (how will balance revenues and expenditures?); and the implementation process (what ways will budget decisions be carried out?).

As you read this case, you might reflect upon the following points:

Why was it so urgent for the CIA to construct a new spy satellite?

How did Boeing win the contract to build FIA over its competitor, Lockheed Martin?

Were FIA's technical and budget problems apparent in advance? If so, can you describe what prevented the CIA from dealing with them before awarding the contract to Boeing?

As the costs escalated, why did the government take so long to terminate FIA?

Who were the key players in this case and how did their unique backgrounds influence the decisions involving FIA?

Based upon this case study, would you modify or amend Rubin's concept of public budgeting in order to take better account of the significant influence today of contracting in shaping government budgets?

Death of a Spy Satellite Program

PHILIP TAUBMAN

By May 2002, the government's effort to build a technologically audacious new generation of spy satellites was foundering.

The contractor building the satellites, Boeing, was still giving Washington reassuring progress reports. But the program was threatening to outstrip its \$5 billion budget, and pivotal parts of the design seemed increasingly unworkable. Peter B. Teets, the new head of the nation's spy satellite agency, appointed a panel of experts to examine the secret project, telling them, according to one member, "Find out what's going on, find the terrible truth I suspect is out there."

The panel reported that the project, called Future Imagery Architecture, was far behind schedule and would most likely cost \$2 billion to \$3 billion more than planned, according to records from the satellite agency, the National Reconnaissance Office.

Even so, the experts recommended pressing on. Just months after the September 11 terrorist attacks, and with the new satellites promising improved, more frequent images of foreign threats like terrorist training camps, nuclear weapons plants and enemy military maneuvers, they advised Mr. Teets to seek an infusion of \$700 million.

It took two more years, several more review panels and billions more dollars before the government finally killed the project—perhaps the most spectacular and expensive failure in the 50-year history of American spy satellite projects. The story behind that failure has remained largely hidden, like much of the workings of the nation's intelligence establishment.

But . . . the collapse of the project, at a loss of at least \$4 billion, was all but inevitable—the result of a troubled partnership between a government seeking to maintain the supremacy of its intelligence technology, but on a constrained budget, and a contractor all too willing to make promises it ultimately could not keep.

"The train wreck was predetermined on Day 1," said A. Thomas Young, a former aerospace executive who led a panel that examined the project.

The Future Imagery project is one of several satellite programs to break down in recent years, leaving the United States with outdated imaging technology. But perhaps more striking is that the multiple failures that led to the program's demise reveal weaknesses in the government's ability to manage complex contracts at a time when military and intelligence contracting is soaring.

. . . The satellite agency put the Future Imagery contract out for bid in 1998 despite an internal assessment that questioned whether its lofty technological goals were attainable given the tight budget and schedule.

Boeing had never built the kind of spy satellites the government was seeking. Yet when Boeing said it could live within the stringent spending caps imposed by Congress and the satellite agency, the government accepted the company's optimistic projections, a Panglossian compact that set the stage for many of the travails that followed. Despite its relative inexperience, Boeing was given responsibility for monitoring its own work, under a new government policy of shifting control of big military projects to contractors. At the same time, the satellite agency, hobbled by budget cuts and the loss of seasoned staff members, lacked the expertise to make sound engineering evaluations of its own.

The satellites were loaded with intelligence collection requirements, as numerous intelligence and military services competed to influence their design. Boeing's initial design for the optical system that was the heart of one of the two new satellite systems was so elaborate that optical engineers working on the project said it could not be built. Engineers constructing a radar-imaging unit at the core of the other satellite could not initially produce the unusually strong radar signal that was planned.

A torrent of defective parts, like gyroscopes and electric cables, repeatedly stalled work. Even an elementary rule of spacecraft construction—never use tin because it deforms in space and can short-circuit electronic components—was violated by parts suppliers.

By the time the project, known by its initials, F.I.A., was killed in September 2005—a year after the first satellite was originally to have been delivered—cost estimates ran as high as \$18 billion.

"The F.I.A. contract was technically flawed and unexecutable the day it was signed," said Robert J. Hermann, who ran the National Reconnaissance Office from 1979 to 1981 and in 1996 led the panel that first recommended creation of a new satellite system. "Some top official should have thrown his badge on the table and screamed, 'We can't do this system at this price.' No one did."

Boeing's point man on the job was Ed Nowinski, an engineer who had become a top government spy satellite expert during 28 years at the Central Intelligence Agency. "It was a perfect storm," Mr. Nowinski said ruefully. But he acknowledged that Boeing frequently provided the government with positive reports on the troubled project.

"Look, we did report problems," Mr. Nowinski said, "but it was certainly in my best interests to be very optimistic about what we could do."

Boeing, which fired Mr. Nowinski as the project fell apart, declined to comment. A spokeswoman, Diana Ball, said Boeing could not discuss classified programs. . . .

Asked about the recent problems with F.I.A. and other satellite programs, Senator Christopher S. Bond, Republican of Missouri and vice chairman of the Intelligence Committee, said, "It's fair to say we have lost double-digit billions on satellite programs that weren't effectively managed by the government."

This year, a stealth satellite program was killed by Mike McConnell, the director of national intelligence. Also, a new generation of infrared satellites for detecting missile launches has barely survived cost overruns and technical setbacks.

Taken together, these episodes represent a stark reversal for a satellite program born in the most perilous years of the cold war, when American technology

Figure 12.2 An Ambitious Satellite Project

The Future Imagery Architecture project was going to replace older spy satellites, but both of the main pieces of the project ran into trouble.

Electro-Optical Satellite

Captures and transmits pictures

Instrument Unit

Gyroscopes that help adjust satellite orientation were flawed during manufacturing.

Optical System

The initial design called for both wide-angle and close-up capability as well as an image stabilization system. The system was so intricate that engineers said it could not be built, and the design was modified.

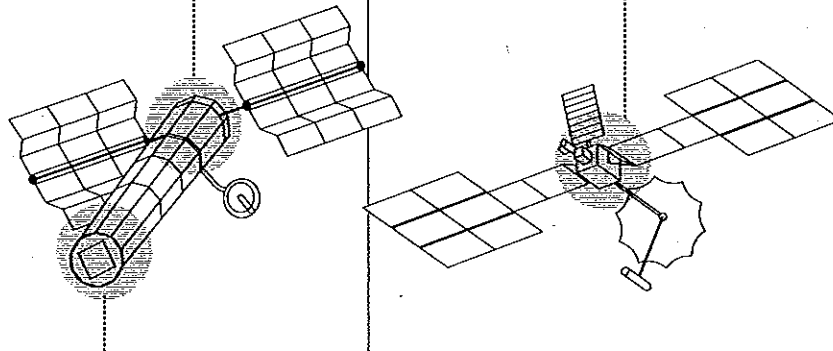
Radar-Imagine Satellite

Uses radar to produce images of the terrain and objects on the ground

Radar

Engineers struggled to generate the powerful radar signal called for in the design.

Since the project drawings are classified, the illustrations above are schematic, and based on older spy satellite systems.



answered the call of national defense by taking spying into space.

Today, space technology has lost its luster for young engineers, who are drawn increasingly to companies like Google and Apple. Defense experts say the entire acquisition system for space-based imagery technologies is in danger of breaking down. And the nation, at least for now, has been left without advanced new systems to replace a dwindling number of reconnaissance satellites first designed in the 1970s and updated in the 1990s.

Even though reconnaissance satellites are less useful in spying on terrorist groups than on more traditional threats like foreign military forces, they remain integral to intelligence and military operations, including monitoring nuclear and missile installations in Iran and North Korea. They are also critical to Pentagon mapmaking and the targeting of precision-guided weapons like cruise missiles.

"There is not a gap in the coverage we are providing, but our constellation is fragile," said Alden V. Munson Jr., deputy director of national intelligence for acquisition.

Since the F.I.A. debacle, the National Reconnaissance Office has banned Boeing from bidding on new spy satellite contracts. But all the news was not bad for Boeing. The company received a \$430 million kill fee for the optical satellite system. And, despite the ban, the radar-imaging satellite remained in Boeing's hands.

Response to Soviet Threat

The first generation of photo reconnaissance satellites was developed in the waning months of the Eisenhower administration, in a frantic effort to measure the Soviet threat.

The satellite system, code-named Corona, was the product of an inspired partnership of government, science and industry. The Central Intelligence Agency set broad goals and then let the Lockheed Corporation, with help from the Air Force, figure out how to build the satellites, get them into orbit and return the film canisters to earth without burning up as they plunged through the atmosphere.

In the mid-1970s, the same partnership developed systems that electronically captured and transmitted pictures moments after they were recorded. These electro-optical satellites were among the first devices to use the technology now common in digital cameras.

They were followed in the 1980s by radar-imaging satellites, which can see through clouds and operate in darkness, bouncing radar signals off the earth to plot terrain and paint images of objects on the ground.

By the 1990s, though, the threats to national security—and the world of satellite intelligence—were undergoing convulsive change.

Familiar targets like Soviet air bases and missile factories were being supplanted by the more varied and elusive threats of the post-cold-war world. At the same time, the armed services, eager for increased tactical intelligence after the 1991 Persian Gulf war, were demanding satellites that could stream battlefield data instantly to commanders around the globe.

In 1996, a commission created by the director of central intelligence recommended building a fleet of light, small, relatively inexpensive satellites that, according to a declassified version of the panel's report, could together be at least as effective as the Lockheed behemoths then in orbit. (They cost about \$1 billion apiece, weighed 30,000 pounds and were the size of a bus.)

Having more satellites in orbit, the theory went, would increase "revisit time," the number of times a day satellites pass above target sites. That would help combat increasing efforts to camouflage such sites.

Lighter satellites would require cheaper and less powerful rockets than the Titan IV's then in use, which could cost \$450 million per launching. The panel also envisioned saving money and time by taking advantage of technologies and parts developed by commercial satellite companies.

But as the concept took shape, several powerful forces were bearing down, turning the satellite procurement system to quicksand, military experts said.

One was the new policy, cousin to the Clinton administration's effort to downsize government, of transferring control of big military projects to contractors, on the theory that they could best manage engineering work and control costs.

Another factor was a decline of American expertise in systems engineering, the science and art of managing complex engineering projects to weigh risks, gauge feasibility, test components and ensure that the pieces come together smoothly.

Finally, troubled by the free-spending habits of the satellite agency, Congress demanded rigid spending guidelines for the satellite project.

The first concerns about the project's formula—high-concept technology on a fast schedule with a tightly managed budget—came from the satellite agency itself.

In early 1997, as the project began to move from conceptual thinking to concrete planning, the agency's acquisition board, which reviewed programs at an early stage, questioned the feasibility of the new approach, given the expected \$5 billion budget cap for its first five years. As Dennis D. Fitzgerald, the agency's principal deputy director from August 2001 until last April, recalled, the board's review "had the most reds and yellows"—agency parlance for cautionary notes—he had ever seen.

Even so, in January 1997, the agency invited military companies to a classified briefing about the project now called Future Imagery Architecture.

A Company Trying to Diversify

Albert D. Wheelon, who founded the Directorate of Science and Technology at the C.I.A. in 1963 and played a leading role in the early development of spy satellites, said in an interview, "Writing winning proposals is different from building winning hardware."

That could be an apt epitaph for Boeing's handling of F.I.A.

Boeing, famous for making airplanes, had never built an electro-optical or radar-imaging spy satellite. But with the European Airbus consortium threatening its commercial airliner business, the company was trying to diversify.

By contrast, the other invited bidder, Lockheed, saw the contract almost as an entitlement, military and government officials said.

Lockheed all but owned the imagery-satellite franchise. Over four decades, as the company built successive generations of satellites, the government had, in effect, invested more than \$30 billion in its operations. What is more, Lockheed had recently acquired the traditional builder of radar-imaging satellites, Martin Marietta (and with it a new name, Lockheed Martin).

"Lockheed believed it had this program in the bag," said Leslie Lewis, a military analyst who reviewed the project for a Rand Corporation study.

As Boeing mobilized, Ed Nowinski seemed the perfect man to pursue the prize.

Mr. Nowinski, 63, was familiar with the concept of smaller satellites from his years at the C.I.A. An electrical engineer, he had joined the agency in 1967 and worked on the first electro-optical systems. Eventually, he became head of the agency's satellite development programs and of imagery operations at the National

Reconnaissance Office and received several medals for distinguished service.

Former co-workers describe Mr. Nowinski as a fine engineer and an easy colleague, an unassuming man who took pride in working on secret projects that enhanced American security. They also said he could be insufficiently demanding, a potential weakness for someone running a multibillion-dollar project. Mr. Nowinski did not contest the description in an interview.

His government career had ended abruptly in October 1995, when the C.I.A. fired him for using a government car for personal travel. Mr. Nowinski said he was trying to make the most efficient use of his time when he was swamped with work and had to travel frequently between his home and several government offices in the Washington area.

In 1998, a former C.I.A. colleague, Robert J. Kohler, invited Mr. Nowinski to help Boeing put together its satellite proposal. He was soon living in a rented apartment near the Boeing defense systems offices in Seal Beach, on the outskirts of Los Angeles, working 12 hours a day, 7 days a week on Team 377, the company's secret planning group.

"I never imagined they would recompute the business," Mr. Nowinski said. "When Lockheed didn't call, Bob and I figured we'd go with the underdog."

Mr. Kohler recalled that Team 377 requested \$100 million just to draft the proposal; he said Harry Stonecipher, Boeing's president at the time, gave his approval the next day. Before long, more than 300 engineers and other specialists were at work in Seal Beach.

If they looked like underdogs, they had history on their side. Mr. Fitzgerald, the reconnaissance office's former deputy director, said the government had traditionally found it hard to resist new bidders on space programs, with their allure of new ideas and lower costs. Indeed, of 18 government space programs re-opened for competitive bidding between 1977 and 2002, all but two ended up changing hands, he said.

Mr. Fitzgerald explained the dynamic this way: "You as the incumbent are probably going to write a realistic proposal because you know what's involved and propose pretty much what you've been doing, since it has been successful. Your competitor, out of ignorance or guile, is going to write probably a more imaginative, creative proposal for which there is almost no backing."

He added, "It's a little like a divorce, and running off with another woman."

The leaders of Team 377 realized that the best hope of impressing the satellite agency was to design a system that was cheaper and better—more technologically

daring—than anything Lockheed might propose. Having worked closely with Lockheed while at the C.I.A., Mr. Kohler said: "I knew what Lockheed Martin was going to do. We would do things 180 degrees differently."

Multiple Design Challenges

Designing and building a precision-pointing, high-resolution electro-optical satellite—roughly the equivalent of the Hubble Space Telescope—requires melding many engineering disciplines.

The satellite must withstand the explosive force of being rocketed into orbit, then operate flawlessly for years in the unforgiving environment of space.

To position itself for picture taking, it requires delicately tuned attitude control and propulsion systems.

The electro-optical system presented an especially formidable challenge. The large, heavy satellites of the past had been effective at limiting the movement and vibrations that might mar picture taking, just as a tripod can eliminate blurred images with hand-held cameras.

"If you vibrate, you're looking at Jupiter," one satellite expert said.

Boeing, in effect, sought to replace the tripod with a system that would automatically adjust the image to compensate for any vibration, much as a camcorder does, but on a far grander, more exacting scale.

The team also wanted an optical system that could take wide-angle images, showing large areas on the ground, as well as tightly focused, detailed pictures of small objects. The goal, to use an oversimplified analogy, was a revolutionary zoom lens.

As for the radar-imaging satellite, Boeing designed a relatively simple system with one major exception: to improve image quality, it would produce a far stronger radar signal than any previous satellite had.

Pulling off such complex new technology typically requires extensive testing and work on multiple solutions to especially difficult problems. There is no margin for error—once in orbit, a broken satellite cannot be easily fixed.

Yet the budget for F.I.A. was limited and not very elastic, unlike those for many earlier projects.

"Some programs are slightly underfunded, some are significantly underfunded," said Mr. Young, chairman of one of the panels that examined the project and a former Martin Marietta executive. "F.I.A. was grossly underfunded."

Congress had set a cap of \$5 billion for the first five years, with spending limited to \$1 billion a year. (It also budgeted \$5 billion more for the life of the project, including multiple satellites.) While the prime contractor could seek additional financing for unanticipated costs, the contract would discourage overruns or delays with financial penalties.

Also, the satellite agency, under pressure from Congress to control costs, would no longer have a reserve fund. "From 1961 to 1995, the N.R.O. had never delivered a program that I'm aware of on cost or on schedule," Mr. Fitzgerald said, adding, "But we always had this margin that would allow us to buy our way out of problems."

To underscore the importance of the budget cap, the agency changed its system for scoring contract bids. Previously, price had rarely accounted for more than 25 percent of a company's score. Now it would account for 50 percent.

As Boeing was putting the finishing touches on its proposal, Mr. Kohler said he warned the company that a \$5 billion bid was unrealistic.

"I did a simple calculation," he recalled. "I took what it had cost to build a comparably complex system before, figured in inflation, and realized the project would cost \$4 billion more than the government had planned and Boeing was proposing."

"I said, 'We can't submit that bid.'"

Mr. Nowinski rejects the idea that the bid was off base. "We were very meticulous in putting together the proposal," he said. Still, he acknowledged, "It's true there was little if any margin to work with."

Mr. Fitzgerald compared the bidding to liar's poker, a game based on the serial numbers on dollar bills that relies heavily on bluffing and gamesmanship.

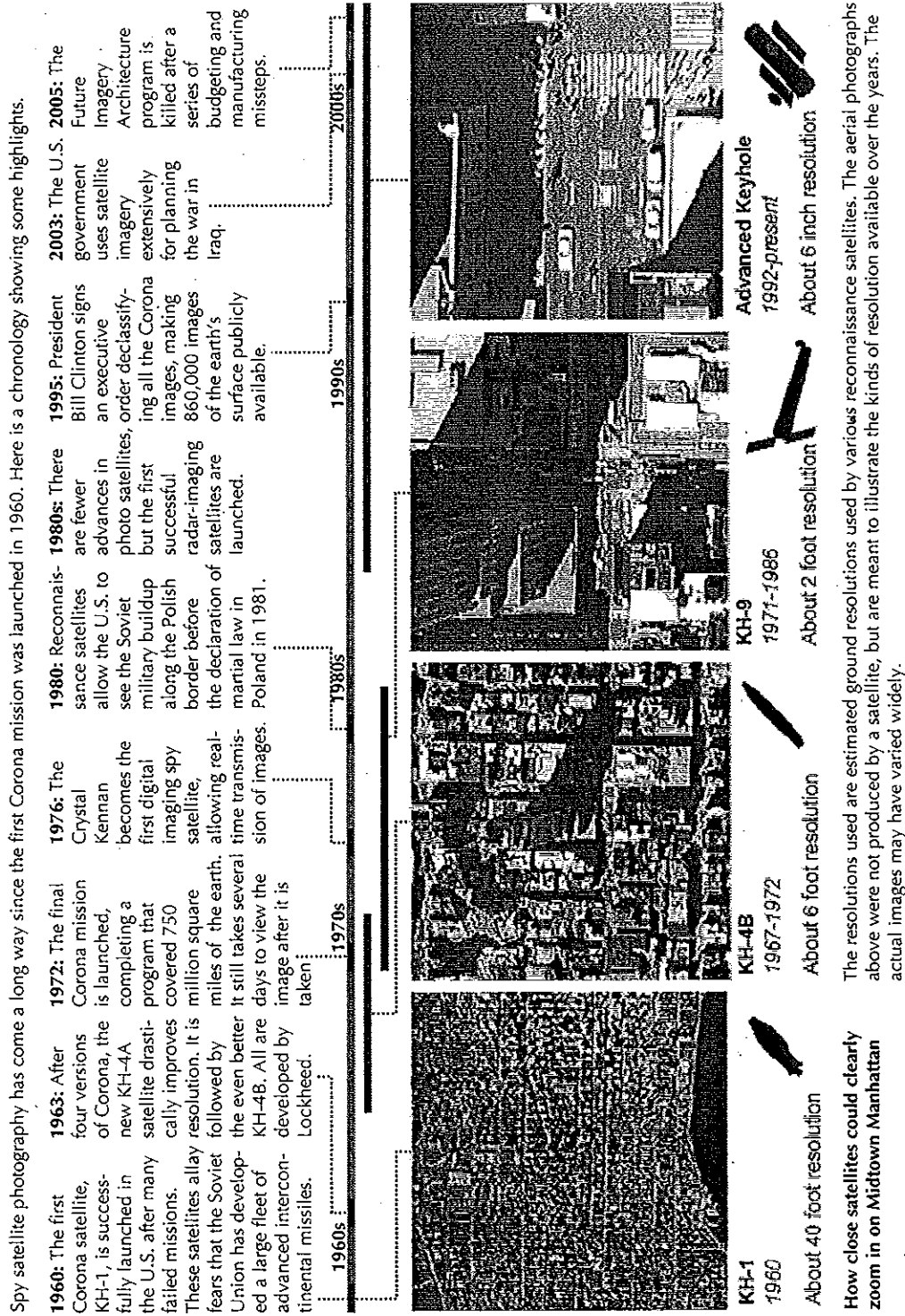
"There's a lot of money on the table, and no wants to say that they can't do it," he said. The ethic, he added, is "win the program at any cost and sort it out later. Correct the government's sins and my sins with overruns."

This time around, that would prove impossible.

Winning Bid Is Announced

The National Reconnaissance Office announced its decision on September 3, 1999, after studying the bids for nearly a year. The top brass at Seal Beach gathered in shirt sleeves at 9 A.M. in the office of Roger Roberts, head of Boeing's satellite operations. Over the speakerphone,

Figure 12.3 A Clearer Picture of Satellite Images



Source: GlobalSecurity.org; Photographs by Sanborn, via Google Earth

an agency official read a brief statement awarding both satellites to Boeing.

"The room was momentarily silent," Mr. Nowinski recalled. "We hadn't really expected to win the whole project. We figured we'd be lucky to get the radar system. I was stunned."

They threw open the door and informed a crowd of colleagues waiting in the outer office. The room erupted in cheers.

The final decision had been made by Keith R. Hall, who became the satellite agency's director in 1997 after serving as a senior intelligence official and deputy staff director of the Senate Intelligence Committee.

Mr. Hall, now a vice president of the consulting firm Booz Allen Hamilton, recalled in an interview that, though both bids claimed to fall within the spending cap, an agency evaluation team had calculated that only Boeing's actually would. Its plan was also deemed the more technologically innovative.

Even a former Lockheed Martin executive vice president, Albert E. Smith, acknowledged that "Boeing wrote a better, cheaper proposal than we did."

The upshot, Mr. Hall said, was that there was really "no choice in the source selection." He added that he considered the Boeing proposal executable, if moderately risky.

The award announcement had barely been completed, though, when dissenting grenades started landing at the satellite agency.

Lockheed Martin, infuriated by the decision, filed a protest, which froze the project for several months as the agency reviewed its decision.

Eventually, Lockheed Martin withdrew its protest. Dennis R. Boxx, the company's senior vice president for corporate communications, said he could not comment on classified projects. But government and industry officials said the company stood down after the agency awarded it a consolation prize, a relatively small piece of the project.

Within a few months, two cost-estimating groups, one operated by the Pentagon, the other by the office that coordinates work among intelligence agencies, determined that the Boeing plan would bust the budget caps.

By then, Mr. Hall said, it was too late to reopen the bidding.

Nor did the cheering last long at Seal Beach. As Boeing moved from writing its proposal to building the hardware, assembling a work force of thousands, outside engineers questioned the photo satellite's intricate optical system.

"There were a lot of bright young people involved in developing the concept, but they hadn't been involved in manufacturing sophisticated optical systems," said one military industry executive familiar with the project. "It soon became clear the system could not be built."

The design was eventually supplanted by a more conventional approach, partly to accommodate added intelligence collection requirements from Washington, Mr. Nowinski said.

Expectations about relying on the commercial satellite industry for parts and know-how proved wrong, since those companies curtailed production and laid off experienced technicians after the dot-com collapse.

Soon, defective parts began showing up in critical components, forcing costly delays at Boeing and some subcontractors.

"The No. 1 problem that killed us on this project was substandard parts," Mr. Nowinski said.

One of the electro-optical satellite's most important components—a set of oversize gyroscopes that help adjust the spacecraft's attitude for precision picture-taking—was flawed, said engineers involved in the project. The problem was traced to a subcontractor that had changed its manufacturing process for a crucial part, inadvertently producing a subtle but disabling alteration in the metallic structure that went undetected until Boeing discovered it, three years into the project.

Several kinds of integrated circuits for the electro-optical satellite also proved defective. Even rudimentary parts like electric cabling were unfit for use, several engineers said. Customized wiring did not conform to the orders and in some cases was contaminated by dirt.

As for the sister satellite, Mr. Nowinski said, "We thought the radar system would be a piece of cake."

But the plans were impeded by unexpected difficulties in increasing the strength of the radar signals that would be bounced off the earth. The problem, among other things, involved a vacuum-tube device called a traveling wave tube assembly. Perhaps most surprising was the appearance of parts containing tin, forbidden because it tends to sprout tiny irregularities, known as "tin whiskers," in space. One military industry executive said he was astounded when, several years into the project, he got a form letter from Boeing telling suppliers not to use tin.

"That told me there had been a total breakdown in discipline and systems engineering on the project," he said, "and that the company was operating on cruise control."

Signs of a Project in Trouble

The tight schedule called for the radar-imaging satellite to be delivered in 2004 and its sister spacecraft the next year. Three years before that first deadline, government and industry officials say, it was becoming clear that the project was in trouble.

As costs escalated, Boeing cut back on testing and efforts to work several potential solutions to difficult technical problems. If a component failed, Boeing, lacking a backup approach, had to return to square one, forcing new delays.

Yet the company hesitated to report setbacks and ask for additional financing.

"When you've got a flawed program, or a flawed contract, you really have an obligation to go to the customer and tell them," Mr. Young said. "Boeing wasn't doing that."

The reason, according to an internal reconnaissance office post-mortem, was the budget cap, and the steep financial penalties for exceeding it. "The cost of an overrun was so ruinous that the strongest incentive it provided to the contractor was to prove they were on cost," the post-mortem found.

It did not help that the government ordered two major and several minor design changes that added \$1 billion to cost projections. The changes, government and industry officials said, were intended to give the electro-optical satellite the flexibility to perform additional functions.

It was against this backdrop that Mr. Teets, the satellite agency's new director, formed the review group in May 2002 that recommended pressing on and seeking new financing.

The next year the government ordered up another look at the project, as part of a broader examination of failing military space programs. The study, led by Mr. Young, reported that F.I.A. was "significantly underfunded and technically flawed" and "was not executable."

By this time, the government had approved an additional \$3.6 billion. Still, rather than recommending cancellation, the Young panel said the program could be salvaged with even more financing and changes in the program and schedule.

In an interview, Mr. Young said the panel genuinely thought the project could be saved. Several members, though, said the group should have called for ending the program but stopped short because of its powerful supporters in Congress and the Bush administration.

Among the most influential was Representative Jane Harman, the ranking Democrat on the House Intelligence Committee, whose Southern California district includes the Boeing complex where the satellites were being assembled.

The death sentence for F.I.A. was finally written in 2005. Another review board pronounced the program deeply flawed and said propping it up would require another \$5 billion—raising the ante to \$18 billion—and five more years. And even with that life support, Mr. Fitzgerald recalled, the panel was not confident that Boeing could come through.

That September, the director of national intelligence, John D. Negroponte, killed the electro-optical program on the recommendation of the reconnaissance office's new director, Donald M. Kerr. Lockheed was engaged to reopen its production line and build an updated model of its old photo satellite.

Government officials say the delivery date for that model has slipped to 2009. Late last year, a Lockheed satellite carrying experimental imagery equipment failed to communicate with ground controllers after reaching orbit, rendering it useless.

Boeing calculated that its revenue losses from the cancellation would total about \$1.7 billion for 2005 and 2006, less than 2 percent of forecast revenues. Having kept the radar-satellite contract, the company is expected to deliver the first one in 2008 or early 2009, at least four years behind the original schedule.

The Search for Lessons

The satellite agency and military experts are still sifting through the wreckage, looking for lessons—beyond the budget issues—that would prevent a similar meltdown in the future.

In . . . September, Mr. Kerr, who last month became principal deputy director of national intelligence, said a pivotal factor was selecting a company with no experience building imagery spy satellites, especially when contractors were being given greater responsibility for monitoring their own work. Boeing, he said, was "in a way exquisitely unprepared to exercise judgment in certain areas because it wasn't within their own experience."

The satellite office's oversight is faulted, too. Jimmie D. Hill, a former deputy director, said transferring management authority to military contractors was a morale killer for officers who worked on Air Force satellite

projects, many of whom had been recruited to be midlevel managers at the National Reconnaissance Office.

"Most of the best and the brightest young captains and majors said, 'To hell with it, there's nothing for me to do here, I'm going to go do something that's interesting,'" Mr. Hill said. "And so you have a void in capability right now."

There is wide agreement among military experts that F.I.A. sunk under a surfeit of data demands and technological risks.

"There's a good rule on projects like this," said Representative Heather A. Wilson, a New Mexico Republican on the Intelligence Committee. "Aim for only one miracle per program."

The government has taken remedial steps. While still at the satellite agency, Mr. Kerr said he was working to attract and keep experienced engineers and to improve cost-estimating and systems-engineering expertise. At his invitation, Virginia Tech University is offering a master's program in engineering management at agency headquarters outside Washington.

Mr. Munson, the deputy national intelligence director for acquisition, said competitive bidding for space programs would be initiated only among companies deemed qualified. And the intelligence office has formed an independent cost-estimating group to review

project proposals and set budgets. "We are not going to start programs we can't afford," he said.

Keith Hall, the man who chose Boeing to build F.I.A., said the cost caps distorted the entire enterprise.

"If I had to do it over again, I should have decided at the time the cost cap was levied that we would just keep building what we had been building," he said, referring to the Lockheed satellites. "I shouldn't have allowed it to go forward."

In the dying days of F.I.A., Boeing fired Ed Nowinski. He returned to his retirement home in Florida, where he keeps a hand in the space business as a consultant.

He blames himself for some of the tribulations.

"You know, I might have been exactly the wrong guy for this project," he said. "After 25 to 30 years in the government, I think too much like a government guy. I was too sympathetic to the government, tried too hard to make their jobs easier."

He also faults himself for failing to assemble a stronger team at Boeing. "I should have been more brutal with the government and with my people," he said.

Mr. Nowinski remains convinced that with adequate time and money, Boeing could have built the electro-optical satellite. "We had solved most of the problems," he said.

But, he added, "When they say, 'We're turning the lights out, the game is over,' you might as well go home."

Chapter 12 Review Questions

1. Why does Irene Rubin at the outset argue that "public budgets are not merely technical managerial documents; they are also intrinsically and irreducibly political"? Do you agree or disagree based on your reading of the case "Death of a Spy Satellite Program"?
2. In two or three sentences, summarize how Rubin defines "a public budget." How does it differ from the budget of a private firm?
3. Why does Rubin stress that the chief tension in public budgeting is between public accountability and public acceptability? What does she mean by those terms? Was that tension illustrated in the case study, "Death of a Spy Satellite Program"?
4. Who are the major participants that Rubin believes are most involved in the public budgetary processes? What are they trying to achieve? Who was involved in the "Spy Satellite" case and what were the positions they took as well as the strategies they used to achieve their goals?
5. List the five basic "budgetary decision-making clusters" that Rubin's essay outlines. Who are the key actors involved in each cluster? The special pattern of politics in each cluster? Can you describe how each cluster is represented in the spy satellite case? Did the decision-making processes in the case confirm to the patterns described by Rubin? If so, how? If not, where and why?

6. What are the essential differences between microbudgeting and macrobudgeting according to Rubin? Why is it important to distinguish between the two? Did the spy satellite case represent either or both?

Key Terms

bureau chiefs	balance cluster
chief executive officers	budget implementation
power differentials	microbudgeting
separation of payer and decider	macrobudgeting
open environment	legal environment
budget constraints	intergovernmental grant structure
reform orientation	individual strategies
incrementalist view	budget outcomes
revenue cluster	fiscal year
expenditure cluster	policy choices

Suggestions for Further Reading

An excellent way to increase your understanding of budgets is to obtain a current city, county, state, or federal budget (usually the summary document provides all the important information) and read it carefully. Most summaries are written so that the layperson can understand their major contents and proposals. Also, now that public budgets are frequently the subjects of front-page headlines, read the major news coverage devoted to them, particularly in leading newspapers like the *New York Times*, *Washington Post*, *Los Angeles Times*, *St. Louis Post Dispatch*, and *Wall Street Journal* as well as in news magazines like *Time*, *The Economist*, and *Newsweek*. The best up-to-date, scholarly survey of budgetary subjects is found in a thoughtfully edited journal, *Public Budgeting and Finance*. Each issue contains insightful articles by some of the leading experts in the field. Also do not neglect studying current issues of the *Public Administration Review*, *The National Journal*, *Governing*, as well as the annual volumes of *Setting National Priorities* published by the Brookings Institution in Washington, D.C.

Although they become dated quickly, introductory texts also offer a useful overview. For the best recent ones, see Robert D. Lee, Jr., and Ronald W. Johnson, *Public Budgeting Systems*, 7th ed. (Gaithersburg, Md.: Aspen Publishing, 2004); David Nice,

Public Budgeting (Belmont, Calif.: Wadsworth, 2001); Irene S. Rubin, *The Politics of Public Budgeting*, 4th ed. (New York: Seven Bridges, 2000); John L. Mikeskill, *Fiscal Administration*, 6th ed. (Belmont, Calif.: Wadsworth, 2002); and James J. Gosling, *Budgetary Politics in American Government*, 4th ed. (New York: Garland, 2005). For an outstanding historic collection of several of the best essays written on public budgeting, see Allen Schick, *Perspectives on Budgeting*, rev. ed. (Washington, D.C.: American Society for Public Administration, 1987). A handy, free guidebook that explains the difficult and arcane jargon of budgeting is *A Glossary of Terms Used in the Federal Budget Process* (Washington, D.C.: General Accounting Office, 1977). For a useful handbook synthesizing our knowledge on various aspects of budgeting, see Allen Schick, *The Capacity to Budget* (Washington, D.C.: Urban Institute, 1990). Current cases can be found in Aman Khan and W. Bartley Hildreth, *Case Studies in Public Budgeting and Financial Management*, 2nd ed. (Dubuque, Iowa: Kendall/Hunt, 1996).

Undoubtedly, a profound impact on federal budgetary practices was made by the enactment of the 1974 Congressional Budget Reform Act, which is examined in several scholarly books, including Allen Schick, *Congress and Money* (Washington, D.C.: The