

**FAA TELECOMMUNICATIONS INFRASTRUCTURE
PROGRAM: FAA NEEDS TO TAKE STEPS TO
IMPROVE MANAGEMENT CONTROLS AND REDUCE
SCHEDULE RISKS**

Federal Aviation Administration

Report Number: AV-2006-047

Date Issued: April 27, 2006



Memorandum

U.S. Department of
Transportation

Office of the Secretary
of Transportation
Office of Inspector General

Subject: ACTION: Report on FAA Telecommunications
Infrastructure Program: FAA Needs To Take
Steps To Improve Management Controls and
Reduce Schedule Risks
Federal Aviation Administration
Report Number AV-2006-047

Date: April 27, 2006

From: Theodore Alves 
Principal Assistant Inspector General for
Auditing and Evaluation

Reply to
Attn. of: JA-10

To: Federal Aviation Administrator

This report presents the results of our audit of the Federal Aviation Administration's (FAA) Telecommunications Infrastructure (FTI) program. The purpose of the FTI program is to replace seven existing FAA-owned and -leased telecommunications networks with a single network that would cost less to operate. However, expected benefits from reducing operating costs are eroding because of schedule problems. FAA officials recognize these problems and told us that they are committed to taking steps to get FTI back on track.

The largest and costliest network to be replaced by FTI is the Leased Interfacility National Airspace System Communications System (LINCS),¹ operated formerly by MCI WorldCom but now by Verizon.² FTI is considered a mission-critical program because its network will carry the National Airspace System's (NAS) telecommunication services (e.g., voice and radar) for air traffic control operations. These services are currently carried on the LINCS network. When completed, FTI will consist of about 25,000 telecommunications services at over 4,400 FAA sites.

¹ In fiscal year 2005, FAA spent about \$123 million for LINCS and about \$217 million overall to operate and maintain existing telecommunications networks.

² In January 2006, MCI was acquired by Verizon Communications. When the FTI transition began, MCI managed and operated LINCS under a 5-year bridge contract with FAA. LINCS includes about 20,000 of the estimated 25,000 circuits planned to be replaced by FTI. For the purpose of this report, we will refer to MCI as Verizon.

FAA competitively selected the Harris Corporation in 2002 to be its FTI prime contractor. FAA's contract with Harris covers the cost of developing, procuring, and operating the FTI network and is essentially a 15-year lease agreement through 2017. The contract has a minimum base value of \$303 million and a maximum base value of \$1.3 billion, but FAA can accommodate increases in quantities of services ordered up to a contract ceiling of \$3.5 billion. There is no limit on quantities.

FAA's Joint Resources Council³ (JRC) approved a rebaselining of FTI's cost and schedule goals in December 2004. FAA's revised FTI lifecycle cost estimate is \$2.4 billion through 2017 (up from \$1.9 billion.) The lifecycle cost estimate includes all FAA and Harris contract costs. FAA officials cited several reasons for the rebaselining, including growing telecommunications requirements, providing better FTI system security, and adding 5 years to the expected life of the program. For example, since the program started, FAA has increased the number of required sites scheduled to receive FTI equipment from 1,374 to 4,463. FAA's revised schedule goal is to complete the transition to FTI by December 2007. In 2004, FAA estimated that FTI would save the Agency \$820 million cumulatively in reduced operations costs by 2017.

Our audit objectives were to (1) identify the key program risks that could affect program costs and schedule projections and (2) determine whether FAA can transition to FTI within revised estimated cost and schedule baselines. Exhibit A contains additional information on our audit scope and methodology.

RESULTS IN BRIEF

FTI is a high-risk and schedule-driven program that is unlikely to meet its December 2007 revised completion date. In fact, only months after being rebaselined in December 2004 by the JRC, the program began falling behind schedule again and has not recovered. Because the primary purpose of the FTI program is to lower operating costs, which is dependent on deploying the system on schedule, expected benefits are eroding.

FTI is not likely to be completed on time because the JRC did not direct the Program Office to develop a detailed realistic master schedule or an effective transition plan identifying when each site and service will be accepted, when services will be cut over to FTI, and when existing (legacy) services will be disconnected. Further, the Program Office needs to ensure better coordination

³ The JRC is FAA's senior decision-making body that approves funding for major acquisitions.

with its field offices and with Verizon in order to ensure that service disruptions are avoided when services are transitioned to FTI.

Until FAA develops a realistic schedule and effective transition plan, it will be difficult to hold the FTI contractor accountable or determine when the FTI transition will be completed. Moreover, FAA cannot accurately estimate how long Verizon's LINCS services will be needed until it has a realistic schedule. To account for the delays to date, FAA will have to exercise its 1-year option to extend Verizon's existing contract to support the LINCS services but may need to retain Verizon's services for a longer period.

As presented to the JRC, the FTI Program Office's plan only focused on completing "site acceptance," which is primarily the installation of FTI equipment. However, three other critical steps are required to transition FTI services into the NAS and begin achieving cost savings. The additional steps are service acceptance, service cutover, and legacy circuit disconnect. Until FAA disconnects its legacy circuits, projected cost savings from reduced operating costs will not be realized.

While focusing on site acceptance, FAA only disconnected about 3 percent of the legacy circuits by the end of fiscal year (FY) 2005 and accumulated a large backlog of uncompleted work. As a result, the benefits that FAA expected to achieve by reducing its operations costs are eroding while the risk of not being completed on time is increasing. For example, FAA did not realize \$32.6 million in reduced operating costs in FY 2005 that it expected due to the limited progress made disconnecting legacy circuits. Additionally, unless FTI service cutover and legacy circuit disconnect rates accelerate substantially, the estimated cost savings for FY 2006 of about \$102 million is also at risk of not being realized.

In September 2005, we briefed senior FAA officials about our concerns with the status of the FTI program. During the briefing, we discussed, among other issues, the need for the FTI Program Office to develop a realistic master schedule for the four steps required to complete FTI transition. Additionally, we discussed the need for the FTI Program Office to develop and implement a contractually binding transition plan. The Department of Transportation's Investment Review Board (IRB) also raised concerns about the status of the FTI transition and directed FAA to develop better metrics for measuring FTI progress than goals for site acceptance. FAA agreed to develop better cost and schedule metrics, including data based on Earned Value Management (EVM). EVM is a management tool that can be used to identify early warning indicators of potential cost overruns and schedule delays and to make critical decisions in managing contracts.

In December 2005, FTI program officials informed the IRB and the Office of Inspector General (OIG) that beginning in January 2006, additional performance and financial metrics regarding FTI transition schedule, costs, and benefits would be reported to senior FAA, IRB, and OIG officials. FAA has been providing OIG with monthly metrics regarding the status of the FTI program. This is a good first step, but it does not fully address the key risks to the program.

FAA officials agreed with our concerns regarding the FTI schedule and transition plan and told us that they are committed to taking steps to get FTI back on track. Getting the program on track is critical because according to FAA, FTI will establish the framework for migrating to a secure, all-digital network capable of supporting bandwidth to provide high-availability telecommunications services across the NAS.

To achieve the December 2007 completion date for the FTI transition, FAA must accelerate FTI service cutover and legacy circuit disconnect rates by almost 10-fold in FY 2006, as compared to actual disconnects through FY 2005. While pursuing this highly aggressive goal, FAA needs to improve management controls over the FTI program by:

- Developing a realistic master schedule and an effective FTI transition plan. FAA needs to prepare and approve a contractually binding master schedule through FTI completion for the four transition steps. The site acceptance and service acceptance elements of the master schedule should be incorporated into Harris' FTI contract to hold the contractor accountable.

FAA also needs to develop a transition plan with all affected parties to avoid further schedule delays and outages to air traffic operations. FAA needs to coordinate with FAA regional officials to ensure that FTI site-specific requirements are defined and verified before transitioning services to FTI. FAA also needs to ensure that Verizon is included in the transition planning to effectively manage and execute LINCS disconnects after FTI cutovers. In its LINCS Bridge Contract, FAA foresaw the need for Verizon to work with the Agency and Harris to ensure an orderly transition from LINCS to FTI. Therefore, FAA included a contractually deliverable item, called a "comprehensive transition plan," in the contract. However, FAA never ordered the comprehensive transition plan from Verizon.

- Modifying the FTI contract to require that the contractor send its monthly program management information reports to FAA for the fixed-price elements of the contract. The FTI contractor uses a particular management tool called EVM, which is used to identify early warning indicators of potential cost overruns and schedule delays and to make critical decisions

in managing the contract. However, the FTI contract does not require Harris to provide its EVM data for fixed-price elements of the contract, although these represent over 90 percent of the contract value. EVM data would have been useful to assist FAA management to monitor costs overruns for several fixed-price elements of the FTI contract. For example, a fixed-price element in the FTI contract called “network management and operations” increased during the second year of the contract by 32 percent (from \$2.1 million to \$2.8 million).

- Determining the number of circuits and funding requirements for extending the LINCIS bridge contract with Verizon through completion of the FTI transition. The LINCIS contract expires in March 2007, well before FAA’s estimated completion date. The contract includes an option for a 1-year extension through March 2008, but FAA has not executed the extension or determined whether the Agency will need to retain Verizon’s services for a longer period.
- Validating FTI cost, schedule, and benefit information to ensure that FAA’s FTI investment is still cost effective. Given that the FTI transition is experiencing schedule delays and the benefits are eroding, it is important for FAA to develop and validate FTI cost, schedule, and benefit information that reflects the current status of the program. Should FAA continue to experience delays transitioning to FTI, the Agency needs to develop a contingency plan that includes a determination of the cost of maintaining both legacy and FTI networks.

FAA Has Only Focused on Site Acceptances, not Service Cutovers and Legacy Disconnects Required To Complete FTI Transition

In December 2004, FAA’s JRC approved a schedule baseline only for achieving FTI “site acceptance,” which is primarily the installation of FTI equipment. However, following site acceptance, three other critical steps are required to transition FTI services into the NAS and begin achieving cost savings by disconnecting legacy circuits. The additional steps are *service acceptance*, *service cutover*, and *legacy circuit disconnects*. The JRC did not approve a schedule baseline for completing these steps (see Table 1).

Table 1. December 2004 JRC-Approved FTI Schedule Goals Focused Exclusively on FTI Site Acceptance

Transition Steps	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	Total Quantity ^a
FTI Site Acceptance JRC-Approved Plan 12/2004	26	1,064 Sites	1,795 Sites	1,515 Sites	63 Sites	4,463 Sites
FTI Service Acceptance						25,000 Services
FTI Service Cutover						25,000 Services
Legacy Service/Circuit Disconnects						25,000 Services

Source: FAA's December 2004 JRC Decision Brief for FTI

^a Total quantity of services is about 25,000 according to FAA

During FY 2005, the FTI program began experiencing significant schedule delays and did not meet the JRC-approved annual goal of 1,064 FTI site acceptances. For example, according to MITRE,⁴ FAA did not complete site acceptance work at its complex sites (e.g., Air Route Traffic Control Centers) until June 2005, 11 months after the planned completion date. In June 2005—6 months after the JRC approved the schedule—the FTI Program Office drafted a “recovery plan” and reduced its site acceptance goal to 565 sites, a 45 percent reduction from the JRC-approved plan (see Table 2).

Table 2. June 2005 FTI Program Office Recovery Plan Significantly Reduced FY 2005 Site Acceptance Goal

Transition Steps	Prior Years (actual)	FY 2005 (est.)	FY 2006 (est.)	FY 2007 (est.)	FY 2008 (est.)	Total Quantity Required
JRC-Approved FTI Site Acceptance Plan 12/2004	26 Sites	1,064 Sites	1,795 Sites	1,515 Sites	63 Sites	4,463 Sites
Program Office Site Acceptance Recovery Plan 6/2005	26 Sites	565 Sites	1,754 Sites	1,788 Sites	330 Sites	4,463 Sites

Source: FTI Program Office

⁴ MITRE is a Federally Funded Research and Development Center under contract to FAA. MITRE completed an independent technical assessment and evaluation of FTI in July 2005.

While FAA exceeded its revised site acceptance goals established in the recovery plan (about 700 sites through the end of FY 2005), FAA has made very little progress transitioning FTI services into the NAS. For example, by the end of FY 2005, only about 2.5 percent (610 of 24,266) of FTI services had been *cutover* to the NAS for operational use. Similarly, only about 3 percent (591 of 19,322) of the legacy circuits had been *disconnected* at the end of FY 2005. Due to the limited progress made transitioning to FTI in FY 2005, the program has developed a large backlog of uncompleted service acceptance, service cutovers, and legacy circuit disconnect work.

To address this FTI backlog, the Program Office is now planning to accelerate the FTI transition rate substantially in FY 2006, as reported in FAA's January 2006 Monthly Status Report on FTI Metrics. For instance, as Table 3 illustrates, the FTI Program Office plans to accelerate legacy circuit disconnect rates by almost 10-fold from 591 actual disconnects through FY 2005 to 5,046 planned disconnects in FY 2006. This is a high-risk assumption that is not realistic. FAA has already failed to achieve its service cutover and legacy disconnect goals for the first quarter of FY 2006.

Table 3. Numbers of Actual and Planned FTI Service Acceptances, Cutovers, and Legacy Circuit Disconnects, as of January 2006

Transition Steps	Actuals Reported Through FY05	FY 2005 Plan	FY 2006 Plan	FY 2007 Plan	FY 2008 Plan	Total Quantity Planned	Percent Complete Through FY 2005
Service Acceptance	1,520	1,396	7,400	13,190	2,288	24,274 Services	6.3%
Service Cutover	610	1,356	7,264	13,039	2,607	24,266 Services	2.5%
Legacy Service/Circuit Disconnect	591	2,177	5,046	9,325	2,774	19,322 Services	3.1%

Source: FTI Program Office

It is important for FAA to get FTI back on track and meet its goals for completing FTI transition, because delays translate directly into increases in operations costs due to the prolonged sustainment of legacy networks. For example, FAA planned to disconnect enough legacy services to save an estimated \$32.6 million in FY 2005. However, by the end of FY 2005 the Agency actually spent \$217 million for the existing legacy networks, far more than the \$181 million estimated at the beginning of the year. Additionally, unless FTI service cutover

and legacy disconnect rates accelerate substantially, the estimated savings for FY 2006 of about \$102 million is also at risk of not being realized. Furthermore, according to a MITRE analysis of the FTI program, if the program does not achieve its December 2007 completion date, each 1-year delay could translate into as much as a \$100 million increase in telecommunication costs to FAA.

FAA Needs To Develop a Realistic Master Schedule and an Effective Transition Plan Through FTI Completion

FAA needs to develop a contractually binding master schedule and an effective FTI transition plan to avoid further schedule delays and outages to air traffic control operations. FAA has no contractually binding master schedule with Harris through FTI completion. A contractually binding schedule with the contractor is a basic contract management tool for any acquisition program. Yet FAA's FTI contract with Harris does not include a master schedule. Without this tool, FAA cannot know whether its schedule projections (such as FTI completion by December 2007) are realistic, nor can it hold its contractor accountable for failing to meet those projections. Because FAA does not have a detailed master schedule, Harris learns of work FAA expects it to do from contract letters issued monthly by the FTI Program Office. The contract letters only project work required 4 months ahead and therefore do not provide Harris with a reasonable basis for making longer-range projections to plan transition work efficiently.

To better manage and execute FTI transition, FAA needs to develop and approve a master schedule for all four steps (i.e., site acceptance, service acceptance, service cutover, and legacy disconnect) through FTI completion. The master schedule should be incorporated into the Harris contract to ensure accountability.

FAA also needs an effective transition plan. FAA needs to ensure that Verizon is included in the transition planning to effectively manage and execute how LINCS circuits will be cutover to FTI and when the LINCS network will be disconnected.

The FTI Program Office also needs to include FAA regional officials as part of the transition planning to verify site-specific requirements before cutting over to FTI services. This is an important program management control, as was evident by an October 31, 2005, incident at an FAA facility supporting Chicago's O'Hare Airport. Because FTI program officials did not coordinate with FAA regional officials to determine the site-specific requirements, FAA specified the wrong number of FTI circuits for Harris to install before beginning FTI operations. Subsequently, when FAA transitioned the services to FTI, the services failed, causing a loss of critical radar data to O'Hare's air traffic controllers. The controllers had to significantly reduce the number of aircraft operations, and

numerous flight delays occurred until FAA was able to switch back to LINCS after more than a 7-hour delay.

To Improve FTI Contract Management, FAA Needs To Require the FTI Contractor To Provide Monthly Management Reports on the Fixed-Price Elements of the Contract

FAA requires the FTI contractor to provide EVM data on the cost-plus elements of the FTI contract. However, FAA does not require similar data for the fixed-price elements, although they total over 90 percent of the \$1.3 billion contract value. EVM is a management tool that can be used to identify early warning indicators of potential cost overruns and schedule delays and to make critical decisions in managing contracts.

EVM data would have been useful to assist FAA management in monitoring cost growth of several fixed-price elements of the FTI contract due to changes in work requirements. For example, a fixed-price element in FTI contract called “network management and operations” increased during the second year of the contract by 32 percent (from \$2.1 million to \$2.8 million). FAA should be receiving this important information for the fixed-price elements of FTI contract as well, so that the Agency’s executives can make informed decisions about the program’s cost and schedule.

FAA Needs To Determine the Number of LINCS Circuits and Funding Required To Extend the LINCS Bridge Contract

While transitioning to FTI, FAA has a 5-year bridge contract in place with Verizon for leasing telecommunications services over the Verizon LINCS network. The LINCS network contains 20,000 of FAA’s approximately 25,000 circuits, and FAA pays about \$120 million per year to operate and maintain the network. The LINCS contract expires in March 2007, before FAA’s December 2007 estimated completion date. The contract includes an option for a 1-year extension through March 2008, but FAA has not executed the extension.

FAA and Verizon officials need to determine the number of LINCS circuits that will be operating during the extension year and the funding requirements for that period. Since FAA already knows that LINCS will not be completely disconnected by March 2007, FAA needs to begin negotiations to resolve requirements issues and finalize LINCS contract terms and conditions as soon as possible to ensure that LINCS remains available during the extension year and longer if necessary.

To Ensure That FTI Is Still Cost Effective, FAA Needs To Validate FTI Cost, Schedule, and Benefits

Given that the FTI transition is experiencing schedule delays, the program's benefits are eroding, and the December 2004 rebaseline information could not be validated, it is important for FAA to develop and validate FTI cost, schedule, and benefit information that reflect the current status of the program. Until FAA independently validates FTI program information, the cost effectiveness of the investment in FTI will remain questionable. For example, in October 2005, we received an updated FTI status report from the Program Office showing a reduction in the benefit estimate from \$820 million to \$672 million—a drop of approximately \$150 million since the FTI rebaseline was approved. Should FAA continue to experience delays transitioning to FTI, the Agency should develop a strategy outlining its plans to pay for both the FTI network and the legacy networks.

SUMMARY OF RECOMMENDATIONS

To improve FAA program management controls over the FTI transition, we are recommending that FAA:

- Develop a realistic master schedule and an effective FTI transition plan that requires the FTI Program Office to coordinate with Harris, Verizon, and FAA regional offices to manage and execute the FTI transition. Specifically, it should:
 - o develop a master schedule with an approved schedule baseline through FTI completion for site acceptance, service acceptance, service cutover, and legacy circuit disconnects at each site. The schedule should be incorporated into the FTI contract to ensure accountability, and
 - o ensure that Verizon is included in the transition planning to effectively manage and execute LINCS circuit disconnects after cutover to FTI services. FAA also needs to ensure that FTI site-specific requirements are defined and validated with input from FAA regional officials before transitioning to FTI services.
- Modify the FTI contract to require that Harris provide its monthly EVM reports to FAA for the fixed-price elements of the FTI contract.
- Determine the number of LINCS circuits and funding requirements necessary to extend the Agency's LINCS bridge contract with Verizon for the 1-year extension or longer if necessary.

- Validate the FTI schedule, cost, and benefit information to determine if the program is still cost-beneficial or whether it should be modified or terminated.

A complete list of our recommendations can be found beginning on page 24.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

In response to our draft report, FAA indicated that it intends to take a number of actions to increase the effectiveness of project management controls over the FTI program transition. Overall, FAA concurred or partially concurred with all five of our recommendations. When successfully implemented, FAA's planned actions will meet the intent of our recommendations and contribute significantly in moving this highly complex program forward.

FAA stated that it will develop a master schedule and transition plan and will ensure the FTI Program Office coordinates these products with Harris, Verizon, and FAA regional offices. FAA further indicated that the work associated with the schedule and plan will be assigned to accountable field offices and tracked as part of its quarterly performance metrics. Moreover, the Agency stated that it will have the master schedule and transition plan validated by June 30, 2006.

FAA's response also indicated that it plans to take actions to address the other recommendations in this report. These include incorporating the master schedule into the FTI contract with Harris by September 29, 2006, to increase the contractor's accountability and more fully coordinating with Verizon on transition activities by sharing the validated master schedule to improve planning. Additionally, FAA stated that it will increase coordination with FAA regional personnel to ensure that FTI services are properly ordered and that workforce planning reflects regional input. Finally, the Agency stated that it intends to complete negotiations with Verizon before March 2007 for extending the LINCS bridge contract through March 2008, with options for periods beyond that date to ensure that LINCS remains available until the FTI transition is complete.

A complete discussion of Agency Comments and our response can be found starting on page 25.

BACKGROUND

FAA's mission for FTI is to achieve an integrated suite of products, services, and business practices to better meet the telecommunications needs of the NAS and of non-NAS infrastructures. With FTI, FAA will transition from traditional dedicated circuits to on-demand service where appropriate. According to FAA, these services will provide lower unit cost, more efficient bandwidth utilization, improved information security, and state-of-the-art business processes and technology.

FAA began FTI in 1999 after conducting an investment analysis that concluded a single new telecommunications network could cost significantly less than operating and maintaining the multiple networks owned or leased by the Agency. In July 1999, the Agency approved the FTI program cost baseline of \$1.9 billion, which included \$205 million in facilities and equipment (F&E) costs to transition old telecommunication networks to FTI and \$1.7 billion in operations and maintenance (O&M) costs to support the old and new networks over 10 years.

In August 2001, OIG reported⁵ that the initial cost estimate for FTI lacked credible support because there were no field studies or surveys to support the estimate. OIG identified that costs were materially underestimated, and FTI program officials confirmed those results.

In February 2002, the Agency's lease for its largest and costliest existing telecommunications network, LINCOS, was set to expire. LINCOS provides up to 20,000 primary and backup voice and data communication services between Government-selected sites. FAA awarded MCI WorldCom, which has been purchased by Verizon, a \$602 million, 5-year LINCOS bridge contract. Under this contract, Verizon provides hardware, software, and transmission media (e.g., cables) necessary to provide an equivalent level of service as was provided by LINCOS. Verizon also provides operation, monitoring, management, control, maintenance, and administration capabilities.

In July 2002, FAA awarded an Indefinite Deliver, Indefinite Quantity contract to Harris to begin transitioning FTI into the NAS and to provide management and support functions for the FTI networks. FAA's contract with Harris is essentially a 15-year lease that will expire in 2017 and covers the cost of acquiring, operating, and maintaining the FTI network. The contract has a current maximum value of \$1.4 billion and a ceiling amount of \$3.5 billion, with no limits on quantities,

⁵ OIG Report Number FI-2001-076, "Replacement of Telecommunications System, FAA," August 21, 2001. OIG reports are available on the website: www.oig.dot.gov.

meaning there is almost no limit on Harris' ability to sell additional services to FAA until the ceiling is reached.

In December 2004, FAA rebaselined the program, increasing both its F&E and O&M costs for completion of the FTI transition.

- The F&E cost went to \$310 million (up 51 percent from \$205 million). This cost baseline includes FAA's program management and other overhead costs, as well as Harris' start-up costs, engineering services to support network establishment, implementation, and cutover of services. The cost increase was due to, among other things, an increase in the number of sites (from 1,374 to 4,463) to receive FTI equipment.
- The O&M cost increased from \$1.7 billion to \$2.1 billion through 2017, adding 5 years to the expected life of the program.

As a result, projected FTI lifecycle costs (i.e., F&E plus O&M) increased from the original 1999 baseline of \$1.9 billion to the current \$2.4 billion—a \$500 million increase. The FTI Program Office currently estimates that 4,463 FAA facilities and remote sites and about 25,000 telecommunications circuits and service delivery points will be affected by FTI⁶ (see Exhibit B).

FAA has justified the FTI program on the basis that it will cost less to operate than the seven existing networks. Before FAA can achieve any operational savings, however, FAA and Harris must complete a massive telecommunications transition effort. While waiting for FTI, FAA spends over \$200 million per year to fund the seven existing telecommunications networks.

FINDING AND RECOMMENDATIONS

FAA Needs To Take Steps To Improve Management Controls and Reduce Schedule Risks

FTI is a high-risk and schedule-driven program that is unlikely to meet its December 2007 revised completion date. In fact, only months after being rebaselined in December 2004 by the JRC, the program began falling behind schedule again and the program has not recovered. Because the primary purpose of the FTI program is to lower operating costs, which are dependent on deploying the system on schedule, expected benefits are eroding.

⁶ These quantities are current FTI Program Office estimates. Over the past several years, the estimates have fluctuated.

FTI is not likely to be completed on time because the JRC did not direct the program office to develop a detailed realistic master schedule or an effective transition plan identifying when each site and service will be accepted, when services will be cut over to FTI, and when legacy services will be disconnected. Further, the FTI Program Office needs to ensure better coordination with its field offices and with Verizon to ensure that service disruptions are avoided when services are transitioned to FTI.

Until FAA develops a realistic schedule and effective transition plan, it will be difficult to hold the FTI contractor accountable or determine when the FTI transition will be completed. Moreover, FAA cannot accurately estimate how long Verizon's LINCS services will be needed until it has a realistic schedule. To account for the delays to date, FAA will have to exercise its 1-year option to extend Verizon's existing contract to support the LINCS services but may need to retain Verizon's services for a longer period.

As presented to the JRC, FAA's plan focused only on completing "site acceptance," which is primarily installing FTI equipment. However, three other critical steps are required to transition FTI services into the NAS and begin achieving cost savings. The additional steps are service acceptance, service cutover, and legacy circuit disconnect. Until FAA disconnects its legacy circuits, projected cost savings from reduced operating costs will not be realized.

While focusing on site acceptance, FAA only disconnected about 3 percent of the legacy circuits by the end of FY 2005 and accumulated a large backlog of uncompleted work. As a result, the benefits that FAA expected to achieve by reducing its operations costs are eroding while the risk of not being completed on time is increasing. For example, FAA did not realize \$32.6 million in reduced operating cost in FY 2005 that it had expected due to the limited progress made disconnecting legacy circuits. Additionally, unless FTI service cutover and legacy circuit disconnect rates accelerate substantially, the estimated cost savings for FY 2006 of about \$102 million is also at risk of not being realized.

FAA Has Only Focused on Site Acceptances, not Service Cutovers and Legacy Disconnects Required To Complete FTI Transition

In December 2004, the JRC only approved a schedule baseline for achieving FTI site acceptance, which is primarily the installation of FTI equipment. However, following site acceptance, three other critical steps are required to transition FTI services into the NAS for operational use and begin achieving cost savings by disconnecting legacy circuits. The steps are:

- *site acceptance*, a contractual milestone in which Harris demonstrates that network equipment has been successfully installed and is connected to the FTI network operations and control center;
- *service acceptance*, a contractual milestone in which Harris demonstrates that FTI telecommunications services meet all contractual performance specifications and are ready for use by FAA;
- *service cutover*, which means the new FTI equipment and services are operational and satisfy FAA requirements; and
- *legacy disconnect*, which means that the old equipment is turned off and FAA is no longer paying for these services.

During FY 2005, the FTI program began experiencing significant schedule delays and did not meet the JRC-approved annual goal of 1,064 FTI site acceptances. For example, FAA did not complete site acceptance work at its complex sites (e.g., Air Route Traffic Control Centers) until June 2005, 11 months after the planned completion date. Therefore, in June 2005—6 months after the JRC approved the schedule—the FTI Program Office drafted a “recovery plan” and reduced its site acceptance goal to 565 sites, a 45 percent reduction from the JRC-approved plan.

At the end of FY 2005, the FTI Program Office reported that about 16 percent of FTI sites (or about 700 of 4,463) had FTI equipment installed. While FAA exceeded its revised site acceptance goals established in the recovery plan, FAA has made very little progress transitioning FTI services into the NAS or reducing its operating costs by disconnecting existing legacy circuits. For example, by the end of FY 2005, only about 2.5 percent (610 of 24,266) of FTI services had been *cutover* to the NAS for operational use. Similarly, only about 3 percent (591 of 19,322) of the legacy circuits had been *disconnected* at the end of FY 2005. Due to the limited progress made transitioning to FTI in FY 2005, the program has developed a large backlog of uncompleted service acceptance, service cutovers, and legacy circuit disconnect work.

To address the FTI backlog, the Program Office is now assuming that it can accelerate FTI’s transition rate substantially in FY 2006, as reported in FAA’s January 2006 Monthly Status Report on FTI Metrics. For instance, the FTI Program Office plans to accelerate legacy circuit disconnect rates by almost 10-fold from 591 actual disconnects through FY 2005 to 5,046 planned disconnects in FY 2006. This is a high-risk assumption that is not realistic. We note that FAA has already failed to achieve its service cutover and legacy service disconnect goals for the first quarter of FY 2006.

It is important for FAA to get FTI back on track and meet its goal for completing the FTI transition, because delays translate directly into increases in operations costs due to the prolonged sustainment of legacy networks. For example, while FAA expected to spend \$181 million overall for existing legacy networks in FY 2005, the Agency actually spent about \$217 million. Consequently, the FTI program did not realize \$32.6 million in FY 2005 cost savings, due to the limited progress made disconnecting legacy circuits. Additionally, unless FTI service cutover and legacy disconnect rates accelerate substantially, estimated savings for FY 2006 of about \$102 million are also at risk of not being realized. According to the 2005 MITRE analysis of the FTI program, if the program does not achieve its December 2007 completion date, each 1-year delay could translate into as much as a \$100 million increase in telecommunication costs to FAA.

According to MITRE, site acceptance alone is an insufficient metric to track progress toward FTI completion. MITRE added that the December 2004 FTI rebaseline request submitted to the JRC did not document the FTI transition process at a level detailed and sufficient enough to identify pertinent critical elements. For instance, MITRE observed that the revised FTI schedule baseline did not include a metric for service acceptance.

FAA Needs To Develop a Realistic Master Schedule and an Effective Transition Plan Through FTI Completion

FAA needs to develop a realistic master schedule and an effective FTI transition plan to ensure all affected parties (i.e., FTI Program Office, FAA regions, Harris, and Verizon) coordinate and manage the execution of the FTI transition to avoid further schedule delays and outages to air traffic control operations. Currently, FAA has no contractually binding master schedule with Harris. Instead, Harris learns of work FAA expects it to do from contract letters issued monthly by the FTI Program Office. However, the contract letters only project work required 4 months ahead and in our opinion do not provide Harris with a reasonable basis for making longer-range projections to plan work efficiently. The monthly contract letters to Harris are also limited in that they focus primarily on achieving site acceptance.

Having a contractually binding master schedule with its contractor is a basic contract management tool for any acquisition program. Yet FAA's FTI contract with Harris does not include a master schedule. Without this tool, FAA cannot know whether its schedule projections (such as FTI completion by December 2007) are realistic, nor can it hold its contractor accountable for failing to meet those projections. To better manage and execute the FTI transition, FAA needs to develop and approve a master schedule for all four steps through FTI completion. FAA also needs to baseline annual goals for each transition step and incorporate

them as key metrics into the master schedule with realistic dates for completing all steps. Senior FAA decision-makers should then measure FTI program performance against the schedule and hold FTI program and contracting officials accountable for meeting it. According to MITRE's assessment, failure to develop these metrics will result in increased schedule slippage in the overall program.

In addition, FAA needs to ensure that Verizon is included in the transition planning to effectively manage and execute how LINCS circuits will be cutover to FTI and when the LINCS network will be disconnected. In its LINCS Bridge Contract, FAA foresaw the need for its LINCS contractor to work with the Agency and Harris to ensure an orderly transition from LINCS to FTI. Therefore, FAA included a contractually deliverable item, called a "comprehensive transition plan," that the Agency could order when it was ready to do so. However, FAA has never ordered the comprehensive transition plan, thereby removing an incentive for Verizon to aid in the FTI transition.

Furthermore, according to FAA's January 2006 status report on FTI metrics, FAA plans to disconnect over 16,000 legacy circuits by the end of 2007. However, Verizon is only contractually required to disconnect 500 circuits per month, which equates to just over 12,000 circuits by the end of 2007. This is about 4,000 circuits less than the 16,000 circuit goal. Until FAA includes Verizon in its transition plans and both parties agree to a realistic schedule for disconnecting LINCS, the transition will remain at risk of not being completed on time.

Define and Validate Site-Specific Requirements To Avoid Further Schedule Delays and Outages to Air Traffic Control Operations

From the start of the program in 1999, FAA officials underestimated the scope of FTI requirements. Instead of completing site surveys to determine FTI requirements, officials assumed that new FTI equipment would be required for just 1,374 sites and existing telecommunications equipment could be reused at more than 3,000 sites. Subsequently, FTI program officials concluded that new FTI equipment would be required at over 4,400 sites.

Because neither the FTI Program Office nor Harris fully understood site requirements, the scope and complexity of the FTI transition were underestimated. Procuring and installing equipment when requirements are not fully understood introduces high risk to a program. According to MITRE, the FTI Program Office grossly underestimated FTI requirements and compounded the problem by insisting that Harris first focus on FAA's most complex sites, the Air Route Traffic Control Centers (ARTCCs).

For example, in July 2004 when Harris completed installation of FTI equipment at the ARTCCs during the first phase of the FTI transition, Harris and FAA found

that the equipment was inadequate to support all the required FTI services because service requirements had been grossly underestimated. Harris had to upgrade FTI equipment at all the ARTCCs and did not complete the upgrade until June 2005, 11 months after initially claiming to have completed this activity. Even so, according to MITRE, additional FTI equipment will have to be added to each of the ARTCCs later to accommodate connections to FAA remote sites, such as radar facilities.

The FTI Program Office continues to experience problems with fully understanding site-specific requirements, as evidenced by an October 31, 2005 incident at FAA's Terminal Radar Approach Control facility supporting Chicago's O'Hare Airport. FTI equipment failed, causing a loss of critical radar data to O'Hare's air traffic controllers. As a result, the controllers had to significantly reduce the number of aircraft operations, and numerous flight delays occurred. FTI program officials had failed to coordinate with regional engineers to determine the site-specific requirements. The FTI equipment installed did not meet the site requirements because FAA failed to specify the correct number of FTI circuits. While troubleshooting and correcting the problem, FAA technicians had to switch back from FTI to the LINCS network.

During the outage, FAA attempted to switch to the FTI backup but found that no backup service was available because FAA failed to test and validate that a backup line existed. FAA is planning to implement a review process that includes validation of the facility and service requirements by appropriate facility personnel to ensure site-specific requirements are met. A number of other sites have experienced problems transitioning to FTI, including Orlando, Florida.

As FAA plans to accelerate FTI transition rates in FY 2006, it is important that FTI program officials coordinate with facility personnel to define and validate site-specific requirements. FTI requirements should be validated before transitioning FTI services into the NAS to prevent further operational performance risks to air traffic operations.

Based on the Current Rate of FTI Transition, the Program Will Not Be Completed on Time and the Lagging Transition Rate Could Result in a 2-Year Schedule Delay

The FTI Program estimate of completing the transition by December 2007 is unlikely to occur, based on our analysis and estimates included in the FTI Business Case Analysis Report (BCAR). This report was submitted to Office of Management and Budget in July 2005 as part of FAA's Exhibit 300⁷ support for

⁷ The Exhibit 300 is designed to ensure that the business case for investments is made, is tied to the program mission, and complies with Office of Management Budget acquisition management policy.

the FTI program baseline. According to the BCAR, based on the number of sites transitioned to FTI during FY 2005, FTI is more likely to be complete by November 2009—about a 2-year delay—rather than December 2007. This conclusion is supported by separate analyses of FTI transition conducted by FAA and MITRE.

For example, FAA’s BCAR includes schedule completion scenarios for completing FTI transition activities (including site prep and cutover). As illustrated in Table 4, the first schedule shows FAA’s “high-confidence” rates to achieve FTI completion by December 2007. This schedule projected 1,064 sites being completed in FY 2005, which did not occur. Instead, at the end of FY 2005, the FTI program transition rates (about 700 sites) align with FAA’s “worst-case scenario” schedule, which does not project completion until November 2009.

Table 4. FAA’s “High-Confidence” Schedule versus “Worst-Case Scenario” Schedule

	FY 2005 Sites	FY 2006 Sites	FY 2007 Sites	FY 2008 Sites	FY 2009 Sites	FY 2010 Sites
High-Confidence Schedule Completion (12/07)	1,064	1,795	1,515	63	0	0
Worst-Case Schedule Completion (11/09)	710	1,180	1,173	886	461	27

Source: Exhibit 300 Program Baseline; Business Case Analysis Report

Based on the status of the FTI transition through the first quarter of FY 2006, the FTI transition is more likely to be completed sometime in FY 2009. Other estimates, including MITRE’s, also project a later completion date than December 2007. According to the MITRE analysis, each 1-year delay could translate into as much as a \$100 million increase in telecommunication costs to FAA for continuing to maintain its legacy networks.

To Improve FTI Contract Management, FAA Needs To Require the FTI Contractor To Provide Monthly Management Reports on the Fixed-Price Elements of the Contract

According to an Office of Management and Budget guideline⁸ and FAA Acquisition Management System policy, major contracts that are considered high value, critical, or high risk to the Agency, such as FTI, should include full EVM data. EVM is an important oversight tool that can be used by management to identify early warning indicators of potential cost overruns and schedule delays and to make critical decisions in managing contracts. FAA's FTI contract requires Harris to provide EVM data on the cost-reimbursable development elements. This is a small proportion (roughly \$28 million at contract award) of the total contract value. However, FAA does not require Harris to provide EVM data for the fixed-price elements of the contract, which constitute over 90 percent of the \$1.3 billion contract value. EVM data would have been useful to FAA management to monitor cost growth for several fixed-price elements of the FTI contract (see Table 5).

Table 5. Growth in Costs of FTI "Fixed-Price" Contract Elements

Contract Line Item	Prior Fixed Price	Revised Fixed Price	Cost Growth	Percent Increase	Cumulative Billed As of 9/2005
2001BA: Perform Program Management	\$ 7,908,219	\$ 8,080,136	\$171,917	2%	\$ 8,080,136
2006BA: Establish Network Management and Operations	\$ 2,145,556	\$ 2,821,820	\$676,264	32%	\$ 2,821,820
2011BA: Establish Integrated Business Service	\$ 119,591	\$ 412,571	\$292,980	245%	\$ 412,571
3001BA: Perform Program Management	\$ 8,427,338	\$ 8,652,939	\$225,601	3%	\$ 8,652,939
3006CA: Maintain Network Management and Operations	\$15,298,783	\$15,688,783	\$390,000	3%	\$15,688,788

Source: OIG analysis of FAA FTI Contract

⁸ OMB Guideline M-05-23, "Memorandum for Chief Information Officers," August 4, 2005.

During our review, we noted several instances where the costs of fixed-price items were renegotiated at a higher price. For example, a fixed-price contract element called “network management and operations” was originally negotiated for a fixed price not to exceed \$2.14 million during the second year of the contract. The contract was modified at a later date, and this contract element increased to \$2.82 million, an increase of \$676,000, or 32 percent, for that year.

FAA should be collecting EVM data on the entire program to protect Government interests. During our review, we raised this issue with senior FAA executives responsible for the FTI program; they assured us that FAA is planning to expand the use of EVM to cover the complete scope of the FTI contract. FAA now needs to follow through by modifying the FTI contract to require that Harris provide monthly EVM data to FAA for all contract elements.

The FTI program officials’ willingness to renegotiate previously fixed prices upward needs to be monitored because FAA has sought to reduce cost risk by using fixed-price elements. However, if FAA subsequently renegotiates these elements at higher prices, the goal of using fixed-price elements is undermined. The use of EVM data would provide early identification of problems, such as cost growth in fixed-price contract elements due to changes in work requirements.

FAA Needs To Determine the Number of LINCS Circuits and Funding Required To Extend the LINCS Bridge Contract

While transitioning to FTI, FAA has a 5-year bridge contract in place with Verizon for leasing telecommunications services over its LINCS⁹ network. The LINCS network contains 20,000 of the approximately 25,000 circuits planned to be transitioned to FTI, and FAA pays about \$120 million per year to operate and maintain the network. The LINCS contract expires in March 2007, before FAA’s December 2007 estimated completion date for FTI transition. However, the contract includes an option for a 1-year extension through March 2008, but FAA has not executed the extension.

FAA and Verizon officials need to determine the number of LINCS circuits that will be operating during the extension year and the funding requirements for that period. Since FAA already knows that LINCS will not be completely disconnected by March 2007, FAA needs to begin negotiations to resolve requirements issues and finalize LINCS contract terms and conditions as soon as

⁹ LINCS is a mission-critical network because it carries FAA’s air traffic control voice, radar, and surveillance data. In FY 2005, FAA spent at least \$220 million to operate and maintain existing telecommunications networks and of that, about \$123 million was for LINCS.

possible to ensure that LINCS remains available during the extension year and beyond if necessary.

Before executing the extension, FAA's challenge will be to determine the number of circuits that will be operating on the LINCS network after March 2007 so that a reasonable price can be negotiated. However, without a contractually binding master schedule through the end of the FTI transition, it will be difficult for FAA to determine what the LINCS requirement will be by March 2007. Since FAA had disconnected less than four percent (659 of 18,216) of LINCS circuits through the end of November 2005, it is not likely that the transition will be complete without executing the option (see Exhibit C).

FAA Must Update FTI Business Rules To Properly Charge the F&E Account for FTI Transition Activities

FAA does not have adequate controls over how the FTI program is charging costs to its F&E or O&M accounts. The FTI program established business rules that require F&E funds to be used to pay for all FTI transition costs, including equipment, network establishment, and the initial transition of services to the network. After telecommunication services are operating on the FTI network, they should be paid for with O&M funds. However, we found about 20 percent (\$11 million of \$51.9 million) of the O&M funds spent on FTI in FY 2005 were used to pay for FTI transition activities. F&E funds should have been used instead of O&M funds for these activities. By allocating O&M funds to pay for F&E activities, the FTI program is underestimating the F&E cost to complete the FTI transition.

The FTI business rules have not been updated to reflect delays in the FTI transition or to ensure that O&M funds are not used for F&E activities. For example, the business rules state that for the first 2 years of the contract (FY 2003 and FY 2004), engineering services associated with network establishment and service improvements are to be funded from the F&E account. For FY 2005 and later, the business rules call for funding this effort out of the O&M account. However, because FTI is so far behind schedule, many of the engineering services supporting network establishment, implementation, and cutover of services were not completed within the first 2 years (and are still not complete). These continue to be F&E activities and should continue to be funded out of the F&E account.

FAA reports that it cumulatively spent \$283 million on the FTI program through the end of FY 2005. About \$171 million was spent for FTI transition efforts from the F&E account, and \$112 million was spent from the O&M account. These large O&M expenditures for FTI have occurred despite only about 3 percent of the FTI network being operational and far fewer FTI sites and services than planned being connected.

FAA needs to properly charge all transition-related costs to the F&E account in order to make FTI transition costs more transparent and determine where the program stands in relation to the \$310 million F&E cost goal. As long as FAA is using O&M funds to pay for the FTI transition, the \$310 million cost goal is an ineffective metric. When we brought this issue to the attention of program officials, they agreed to review the FTI business rules to address our concerns. Until FAA updates its business rules, this will remain an issue.

To Ensure That FTI Is Still Cost Effective, FAA Needs To Validate FTI Cost, Schedule, and Benefits

Given that the FTI transition is experiencing schedule delays, the benefits are eroding, and the December 2004 rebaseline information could not be validated, it is important for FAA to develop and validate FTI cost, schedule, and benefit information that reflect the current status of the program. Until FAA independently validates FTI program information, the cost-effectiveness of the investment in FTI will remain questionable. For example, in October 2005, we received an updated FTI status report from the Program Office showing a reduction in the benefit estimate from \$820 million to \$672 million—a drop of approximately \$150 million since the FTI rebaseline was approved.

Before the JRC meeting in December 2004 to consider the FTI Program Office's request for cost and schedule rebaselining, FAA's Capital Investment Team (CIT) began evaluating the FTI Program Office's business case data. The CIT reviews investment plans and assesses economic value to assure that proposed investments are justified before the estimates are presented to the JRC. After beginning its evaluation, the CIT recommended that the JRC decision to rebaseline the FTI program be deferred. The CIT reported that the Program Office's business case was questionable, the revised cost and schedule goals appeared to be underestimated, and benefits appeared to be overestimated. Despite the CIT's concerns, the JRC approved rebaselining FTI in December 2004.

FAA policy requires that FAA program officials submit independently validated cost and benefit estimates for planned capital investments, such as FTI, to the JRC before the JRC approves a rebaseline request. The validated cost and benefit estimates are required to ensure that the program is still cost-effective. Validating cost and benefits estimates is important because if the revised program costs are underestimated, cost growth will cause benefits to be reduced, possibly to the point of undermining the cost-effectiveness of the investment. According to FAA officials familiar with the JRC decision, FTI was approved without validated cost or benefits information because the Office of Management and Budget was delaying approval of the FY 2006 FTI budget request pending JRC approval.

In addition to not complying with Acquisition Management System policy, senior FAA officials did not adhere to direction included in the Information Technology Management Reform Act of 1996, known as the Clinger-Cohen Act. The Act is designed to improve the way the Federal Government acquires and manages information technology investments. For example, the Act requires that senior management personnel, such as the JRC, have a means of measuring progress on an independently verifiable basis for cost, capability of the system to meet specified requirements, timeliness, and quality to manage the program. However, senior FAA officials did not receive independently verified FTI program information in December 2004 but approved FTI rebaselining anyway.

It is important for FAA to validate the FTI cost, schedule, and benefit information to ensure the program is still cost effective or determine whether it should be modified or terminated. In addition, in our view, the Agency should begin developing a strategy for how it will pay for both the FTI network and legacy networks beyond the estimated December 2007 timeline.

RECOMMENDATIONS

To increase FAA program management controls over the FTI transition, we are recommending that FAA:

1. Develop a realistic master schedule and an effective FTI transition plan that requires the FTI Program Office to coordinate with Harris, Verizon, and FAA regional offices to manage and execute the FTI transition. Specifically,
 - a) develop a master schedule with an approved schedule baseline through FTI completion for site acceptance, service acceptance, service cutover, and legacy circuit disconnects at each site. The schedule should be incorporated into the FTI contract to ensure accountability, and
 - b) ensure that Verizon is included in the transition planning to effectively manage and execute how LINCS circuits will be cutover to FTI services and when the LINCS network will be disconnected. FAA also needs to ensure that FTI site-specific requirements are defined and validated with input from FAA regional officials before transitioning to FTI services.
2. Modify the FTI contract to require that Harris provides its monthly EVM reports to FAA for the fixed-price elements of the FTI contract.

3. Determine the number of LINCS circuits and funding requirements to extend the Agency's LINCS bridge contract with Verizon for the 1-year extension or longer if necessary.
4. Update FTI Business Rules so that the F&E account is properly charged for FTI transition activities.
5. Validate the FTI schedule, cost, and benefit information to determine if the program is still cost-beneficial or determine whether it should be modified or terminated.

AGENCY COMMENTS AND OFFICE OF INSPECTOR GENERAL RESPONSE

On April 26, 2006, FAA provided comments (see Appendix) to our March 15, 2006 draft report. FAA concurred with four recommendations and partially concurred with a fifth recommendation.

In response to our first recommendation, FAA concurred and stated that it will develop a master schedule and transition plan reflecting all necessary transition work and will ensure the FTI Program Office coordinates these products with Harris, Verizon, and FAA regional offices. The Agency added that it will have the master schedule and transition plan completed and validated by June 30, 2006. FAA also said that it will adjust the schedule based on the validation outcome and incorporate the revalidated schedule into the FTI contract with Harris by September 29, 2006.

Also in response to our first recommendation, FAA concurred with the need to ensure that Verizon is included in FTI transition planning. FAA sent a formal request to Verizon on April 7, 2006, requesting a working meeting to discuss transition planning. Additionally, FAA will take the following steps to continue to include Verizon in transition planning by providing Verizon (1) the validated master schedule and (2) monthly updates to the schedule based upon actual execution.

FAA further indicated that it will include regional personnel in the validation of service requirements and obtain their input before transitioning to FTI services. Moreover, FAA stated that it will ensure services are properly ordered with diversity/redundancy when required based on operational criticality. Regional work will be assigned to an accountable FAA field office and tracked as part of its quarterly performance metrics. FAA expects to initiate these steps by April 28, 2006, and perform them on a recurring basis for the remainder of the FTI transition.

With respect to our second recommendation, FAA partially concurred and stated that it already obtains EVM reports from Harris for the cost-reimbursable work under the contract and uses data from Harris' monthly financial reports and FAA site and service acceptance tracking data to develop its own EVM data for fixed-price contract elements. These data are reported to the FAA leadership. According to FAA's response, it plans to update EVM data as necessary based on the validation of the master schedule by June 30, 2006. While our recommendation called for FAA to acquire Harris' fixed-price EVM data directly, the Agency's planned action to use data from Harris' monthly financial reports to develop its own EVM reports will satisfy the intent of our recommendation.

In response to our third recommendation, FAA concurred and stated that it sent a formal request to Verizon on April 7, 2006, to begin exploratory discussions to negotiate terms and conditions of a LINCOS contract extension for services through March 2008, with options for periods beyond that date. According to FAA, a key input to the discussions will be the master schedule. Based on the schedule, FAA and Verizon will develop a projection of (1) the number of LINCOS circuits expected to remain in operation after March 2008, (2) the phase-out schedule for those circuits, and (3) the funding required until all circuits are disconnected. FAA expects to complete this contract action by March 2007.

Regarding our fourth recommendation, FAA concurred and indicated that it will evaluate the FTI business rules and update business rules so that the F&E account is properly charged for FTI transition activities. FAA expects to have this change in place by May 30, 2006.

In response to our fifth recommendation, FAA concurred and stated that it will validate the master schedule as described in recommendation number one. A key component of the schedule validation activity is an assessment of the program's actual performance to date and the trends in acceptance and cutover rates. Using the outcome of the assessment activity, FAA will complete a cost and benefits reassessment based upon actual and projected legacy and FTI network costs. FAA also stated that the reassessed cost projections will then be compared to those in the December 2004 baseline to determine the benefits variance. FAA expects the validation activities to be completed by September 29, 2006.

When successfully implemented, FAA's planned actions will meet the intent of our recommendations and contribute significantly to improving program management effectiveness. The key to successful implementation will be the Agency's follow through on its planned action to develop a realistic master schedule for the FTI transition. Once this master schedule is developed, we believe that FAA will be in a better position to implement its other planned actions.

ACTION REQUIRED

We consider FAA's actions taken or planned to be taken responsive and meet the intent of our recommendations. In accordance with Department of Transportation Order 8000.1C, the recommendations will remain open until FAA completes all planned actions.

We appreciate the cooperation and assistance of your staff during our audit. If you have any questions regarding this report, please contact me at (202) 366-1992 or David A. Dobbs, Assistant Inspector General for Aviation and Special Program Audits, at (202) 366-0500.

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EXHIBIT A. SCOPE AND METHODOLOGY

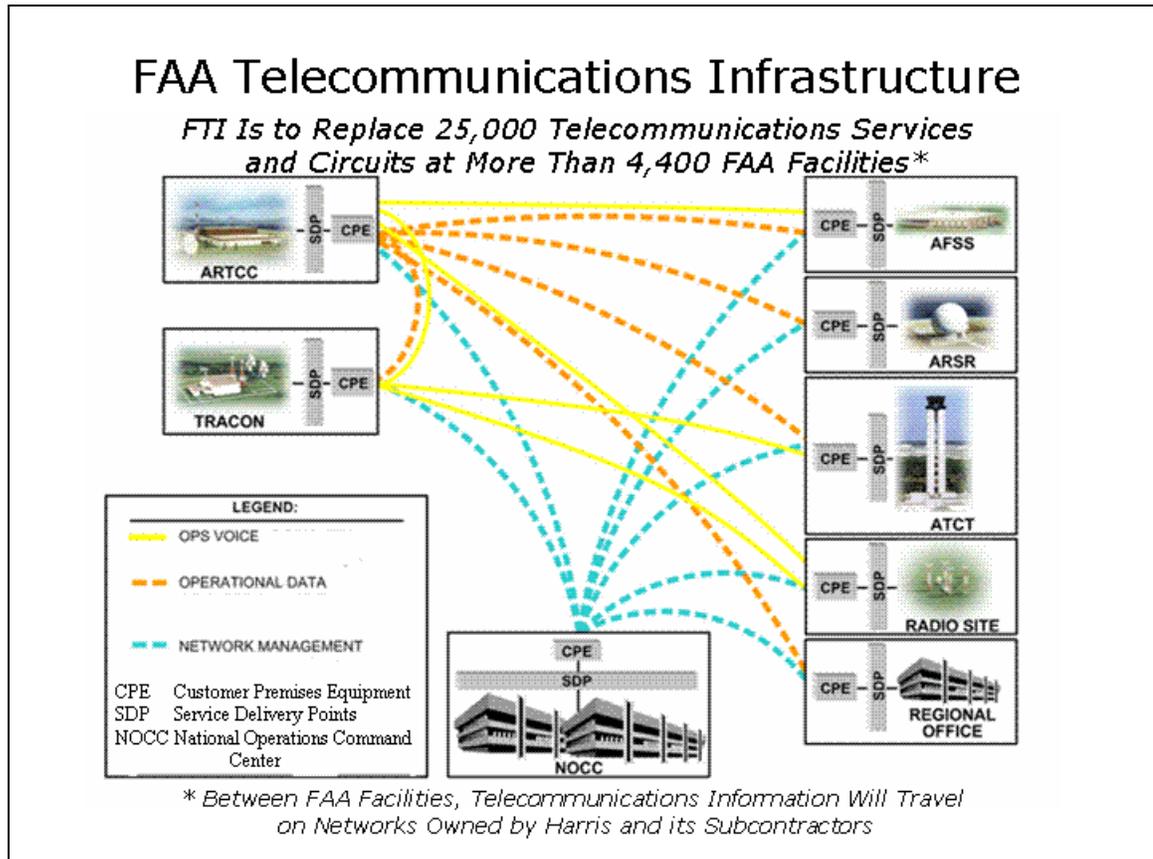
Our objectives for this performance audit were to (1) determine whether FAA could transition to FTI within revised estimated cost and schedule baselines and (2) identify key program risks that could affect program cost and schedule projections. To achieve our objectives, we obtained billed contract cost data, budget data, acquisition plans, cost and schedule projections, contractor financial and performance reports, and other supporting documentation from FAA. We also acquired relevant information from Harris, MCI/Verizon, and MITRE. We analyzed FAA's FTI budget and cost estimates and reviewed FAA's FTI transition strategy documents for reasonableness and cost-effectiveness. We examined FAA's expenditures data for FTI and for FAA's legacy telecommunications networks, including the Verizon LINCS system.

While conducting this review, we interviewed key FAA and FTI program officials at the Agency's Headquarters in Washington, DC, including senior FAA executives responsible for Telecommunications, Acquisition, and Finance, as well as FAA staff members in organizational units reporting to these executives. We interviewed FTI prime contractor officials at Harris' primary FTI location in Melbourne, Florida, as well as at its Washington, DC, office. We also met with officials of MITRE. Additionally, we visited the FAA's Western Pacific and Midwestern Regional Offices and the Air Route Traffic Control Centers for the Western Pacific Region in Palmdale, California, and the Midwest Region in Olathe, Kansas.

We performed our survey and verification work from April 2005 through February 2006. We performed our work in accordance with Generally Accepted Government Auditing Standards as prescribed by the Comptroller General of the United States.

EXHIBIT B. FAA FACILITIES LINKED BY FTI

All of FAA’s facilities (en route, terminal, and tower controls; flight service stations; and radar and radio sites) will be linked by FTI.



Source: Harris Corporation and FAA
 TRACON: Terminal Radar Approach Control

**EXHIBIT C. PERCENTAGE OF IDENTIFIED LINCS CIRCUITS
REPLACED BY FTI SERVICES BY FACILITY AIRSPACE
THROUGH NOVEMBER 2005**

Facility Airspace	Total Number Services and Circuits	Actual Cutovers*	Percent Complete
Washington, DC	1,251	54	4.3%
Los Angeles	1,232	7	0.6%
Boston	1,189	44	3.7%
Atlanta	1,132	30	2.7%
Houston	1,066	8	0.8%
Oakland	1,022	2	0.2%
Fort Worth	999	21	2.1%
Kansas City	946	49	5.2%
Cleveland	933	39	4.2%
Minneapolis	927	27	2.9%
Chicago	905	99	10.9%
Jacksonville	895	20	2.2%
New York	861	16	1.9%
Seattle	817	34	4.2%
Memphis	746	50	6.7%
Albuquerque	719	15	2.1%
Indianapolis	685	65	9.5%
Denver	604	22	3.6%
Miami	594	34	5.7%
Salt Lake City	543	16	2.9%
Honolulu	137	1	0.7%
Anchorage**	13	6	46.0%
Total	18,216	659	3.6%

* Cutover refers to the physical act of transferring telecommunications service from the existing legacy networks to the FTI network.

** FAA's November 2005 update did not include revised figures for Anchorage. Anchorage figures shown are as of July 2005.

APPENDIX. MANAGEMENT COMMENTS



Federal Aviation Administration

Memorandum

Date:

APR 26 2006

To: Assistant Inspector General for Aviation and Special Program Audits

From: Ramesh K. Punwani, Assistant Administrator for Financial Services/CFO

A handwritten signature in black ink, appearing to be "R. Punwani".

Prepared by: Anthony Williams, x79000

Subject: OIG Draft Report: FAA Telecommunications Infrastructure Program:
FAA Needs to Take Steps to Improve Management Controls and Reduce
Schedule Risks

In the subject draft report dated March 15, the Federal Aviation Administration (FAA) was requested to provide specific action taken or planned for each of the five recommendations. The FAA concurs with the OIG recommendation to increase FAA program management controls over the FTI transition. Specifically, we concur with recommendations 1, 3, 4, 5, and partially concur with recommendation 2. The planned actions and target completion dates are described below.

OIG Recommendation 1: Develop a realistic master schedule and an effective FTI transition plan that requires the FTI Program Office to coordinate with Harris, Verizon, and FAA regional offices to manage and execute the FTI transition.

FAA Response: Concur. The FAA made a commitment to the Department of Transportation (DOT) Investment Review Board (IRB) on March 16 to develop a master schedule and transition plan. This activity will be coordinated with Harris, Verizon, and FAA regional offices. The schedule will reflect all work associated with each A-node decommissioning, including site acceptance, service acceptance, service cutover, and legacy service disconnect at each site. The work associated with the schedule will be assigned and tracked to an accountable FAA field office as part of its quarterly performance metrics.

The FAA will perform a validation of the master schedule product by June 30 and adjust as necessary any decommissioning activities. Monthly performance tracking against all planned activities will continue. The DOT IRB plans to meet in June to assess program progress against this action.

OIG Recommendation 1a, Part 1: Develop a master schedule with an approved schedule baseline through FAA Telecommunications Infrastructure (FTI) completion for site acceptance, service acceptance, service cutover, and legacy circuits disconnects at each site.

FAA Response: Concur. The FAA will take the following actions to improve management controls over the FTI program:

- a. prepare a detailed master schedule to include completion for site acceptance, service acceptance, service cutover and legacy circuits disconnects;
- b. validate the FTI master schedule; and
- c. adjust the master schedule based upon the validation outcome.

The target completion date for these activities is June 30.

OIG Recommendation 1a, Part 2: The schedule should be incorporated into the FTI contract to ensure accountability.

FAA Response: Concur. The FAA will incorporate major milestones related to the A-node work packages from the master schedule into the FTI contract once the activities in response 1a, part 1, are completed. The target completion date for this activity is September 29.

OIG Recommendation 1b, Part 1: Ensure that Verizon is included in transition planning to effectively manage and execute how Leased Interfacility National Airspace System Communications System (LINCS) circuits will be cutover to FTI services and when LINCS network will be disconnected.

FAA Response: Concur. On July 29, 2005 the FAA provided Verizon with a comprehensive transition plan for their review and comment. The FAA also sent a formal request to Verizon on April 7, requesting a working meeting to begin exploratory discussions to negotiate terms and conditions on a contract extension for services through March 2008, with options for periods beyond that date. The FAA will take the following additional steps to continue to include Verizon in transition planning by providing Verizon with:

- a. the validated master schedule described in response 1a, part 1; and
- b. monthly updates to the schedule based upon actual execution.

The FAA will be requesting Verizon's review and feedback on the schedule. The FAA expects to complete this action by April 28.

OIG Recommendation 1b, Part 2: FAA also needs to ensure that FTI site specific requirements are defined and validated with input from FAA regional officials before transitioning to FTI services.

FAA Response: Concur. The FAA will include regional personnel in the validation of service requirements and obtain their input before transitioning to FTI services. The FAA will ensure that services are properly ordered with diversity/redundancy when required based on operational criticality. In addition, the FTI Program Office will include Systems Maintenance Office personnel in transition schedule planning to ensure that the transition workload is addressed in workforce planning for field resources. The FAA will initiate these steps by April 28. These steps will be performed on a recurring basis for the remainder of the FTI transition.

OIG Recommendation 2: Modify the FTI contract to require that Harris provide its monthly Earned Value Management (EVM) reports to FAA for the fixed-price elements of the FTI contract.

FAA Response: Partial-concur. The FAA obtains EVM reports from Harris for the cost reimbursable work under the contract. With respect to fixed price elements of the contract, the FAA uses data from Harris monthly financial reports and from FAA tracking of actual site and service acceptance dates to generate the program level EVM data for this work. The EVM information on the firm fixed price work is reported to the FAA leadership as part of the total program EVM reporting, but is generated at the program level by the FAA, not by Harris. This is the same approach that is being used by other FAA programs that have firm fixed-price (FFP) contracts and through this means; the FAA currently has all the information it requires to perform EVM on the full scope of the capital investment for FTI. Additionally, the FAA believes that Recommendation 1a, Part 2, and our response and action effectively yields the desired outcome for ensuring the program schedule performance is being tracked rather than getting into the cost and price issue that is inherent with FFP contract full EVM reporting, at minimal cost to the Government. The FAA will update the EVM data, as necessary, based upon the validation of the master schedule by June 30.

OIG Recommendation 3: Determine the number of LINCS circuits and funding requirements necessary to extend the Agency's LINCS bridge contract with Verizon for the 1-year extension or longer if necessary.

FAA Response: Concur. The FAA sent a formal request to Verizon on April 7, requesting a working meeting to begin exploratory discussions to negotiate terms and conditions on a contract extension for services through March 2008, with options for periods beyond that date. This activity is undertaken as a contingency to ensure extended service is available, where needed, based on execution of the schedule. A key input to the discussions will be the master schedule described in the response 1a, Part 1. In the course of these discussions and based upon actual FTI transition execution relative to the master schedule, the FAA and Verizon will develop a projection of: (1) the number of LINCS circuits expected to remain in operation after March 2008; (2) the phase-out schedule for those

circuits; and (3) the funding required until all circuits are disconnected. The FAA projects completion of the contract action by March 2007.

OIG Recommendation 4: Update FTI Business Rules so that the F&E account is properly charged for FTI transition activities.

FAA Response: Concur. The FAA will evaluate the program business rules and make the changes recommended by the OIG so that the F&E account is properly charged for FTI transition activities. The FAA expects to have the changes in place by May 30.

OIG Recommendation 5: Validate the FTI schedule, cost, and benefit information to determine if the program is still cost-beneficial, or whether it should be modified or terminated.

FAA Response: Concur. The FAA will validate the master schedule as described in response 1a, Part 1. A key component of the schedule validation activity is an assessment of the program's actual performance to date and the trends in acceptance and cutover rates. Using the outcome of this assessment activity, FAA will complete a cost and benefits reassessment based upon actual and projected legacy and FTI network costs. The reassessed cost projections will then be compared to those in the December 2004 baseline to determine the benefits variance. It is important to note that the FTI program has a number of benefits in addition to cost including – enterprise-wide security, multiservice offerings to meet customer demand, management of the inventory, and price management capability - FAA will not pay more than market prices. The recent Mitre study on FTI, used in your analysis of the program, supports these benefits. The FAA expects the validation activities to be completed by September 29.