
Office of Inspector General

Audit Report

***Contract Towers: Observations on FAA's Study of
Expanding the Program***

Federal Aviation Administration

***Report No. AV-2000-079
Date Issued: April 12, 2000***





**U.S. Department of
Transportation**

Office of the Secretary
Of Transportation

Office of Inspector General

Memorandum

Subject: ACTION: Report on Contract Towers: Observations on FAA's Study of Expanding the Program, AV-2000-079 Date: April 12, 2000

From: Alexis M. Stefani Assistant Inspector General for Auditing Reply to Attn of: Dobbs:x60500

To: Federal Aviation Administrator

In response to the request in the Conference Report for the Department of Transportation and Related Agencies Appropriations Act for Fiscal Year 2000, the Office of Inspector General reviewed the Federal Aviation Administration's (FAA) Contract Tower Program (Program). This report provides the information presented to the Appropriations Committees for your information and use.

Our review answered two objectives. The first objective was to determine if previously identified concerns regarding staffing at contract towers have been corrected. The second objective was to evaluate the accuracy and completeness of FAA's study of expanding the Contract Tower Program to ensure all relevant costs and benefits were appropriately identified and considered.

We found that contract towers continue to provide services that are comparable to the quality and safety of FAA-operated towers. Users remain supportive of the Program and previously identified staffing issues have been addressed. We also found that FAA's study did not fully consider several key factors of expanding the Program that should be further analyzed and reported to Congress. We are recommending that FAA revise its draft study of expanding the Contract Tower Program to provide Congress a better perspective of the feasibility, costs and benefits of expanding the Program.

During our audit, we met with the Acting Deputy Administrator regarding our findings and recommendations and have taken his comments into consideration in preparing this report.

In accordance with Department of Transportation Order 8000.1C, we would appreciate receiving your written comments within 30 days. If you concur with our findings and recommendations, please indicate for each recommendation the specific action taken or planned and the target dates for completion. If you do not concur, please provide your rationale. Furthermore, you may provide alternative courses of action that you believe would resolve the issues presented in this report.

We appreciate the cooperation and assistance provided by you and your staff during the audit. If you have any questions or need further information, please contact me at x61992 or David Dobbs, Deputy Assistant Inspector General for Aviation, at x60500.

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Contract Towers: Observations on FAA's Study of Expanding the Program

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Background

The Federal Aviation Administration (FAA) began contracting out air traffic services at low activity (Level I) towers in 1982 as a result of the Professional Air Traffic Controllers Organization strike. In 1993, Vice President Gore's National Performance Review endorsed the Contract Tower Program (Program) as an effective means of reinventing government services. Currently, there are 187 towers in the Contract Tower Program operated by 3 contractors. In July 1999, FAA issued a new solicitation for the Contract Tower Program, but as of April 2000, had not awarded final contracts.

FAA's Contract Tower Program has been successful in providing air traffic control services at low activity airports at lower costs than the agency could otherwise provide. FAA's current Contract Tower Program saves the agency about \$250,000 per tower, annually. The Program also provides service at towers that FAA would otherwise not have staffed because they were too expensive to operate. In light of the Program's success, Congress last year directed FAA to conduct a study to determine if additional savings could be achieved by expanding the Contract Tower Program to other FAA-operated air traffic control towers "without radar capability." FAA currently operates 71 visual flight rules (VFR) air traffic control towers employing about 960 controllers. (Exhibit A provides a list of the 71 towers and certain statistical information about each facility.)

Prior Coverage

In 1998 we conducted a comprehensive review of the Contract Tower Program and found little difference in the quality or safety of services provided at Level I towers whether they were operated by FAA or by contractors. Specifically, we found that contract controllers met qualification requirements and received required training, users were satisfied with the services they received at contract locations, and the number and types of incidents at FAA and contract towers were comparable.

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We also found that contract towers reduced operating costs. However, we found that not all contract towers were staffed according to contract staffing plans. We recommended that FAA direct contractors to staff contract towers in accordance with contract requirements and establish procedures to periodically review staffing levels at contract towers. Those measures were necessary because contract towers were staffed with fewer controllers than FAA-operated towers and staffing levels were based on contractor-prepared staffing plans.

Objectives

This review was conducted at the request of Congress in the Department of Transportation and Related Agencies Fiscal Year (FY) 2000 Appropriations. The objectives of our review were to (1) determine if contract towers were being staffed in accordance with contract requirements and assess FAA's oversight of contractor compliance, and (2) evaluate the accuracy and completeness of FAA's study of expanding the Contract Tower Program to determine whether all relevant costs and benefits were appropriately identified and considered. (Exhibit B contains the scope of our review and the methodology used in conducting it.)

Results in Brief

Contract towers continue to provide cost-effective services that are comparable to the quality and safety of FAA-operated towers. For example, the level of operational errors in FY 1999 at contract towers was comparable to the level of operational errors at FAA VFR towers. The Contract Tower Program also provides services at towers that FAA would otherwise not have staffed because they were too expensive to operate. Users remain very supportive of the Program and believe that the services they receive at contract towers are comparable to FAA-operated towers.

We also found that previously reported staffing issues have been addressed. We tested payroll records for a 2-month period at 37 contract towers and found that contractors (in total) provided the required number of employees and hours within 2 percent of the contractual requirements. In addition, FAA's new contract solicitation contains specific provisions requiring contractors to report and certify monthly the number of controllers at each location and the hours they worked.

FAA completed a draft study of expanding the Contract Tower Program in September 1999, but as of April 2000, had not issued a final report to Congress. In the draft study, FAA concluded that no net savings would be realized from

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further expanding the Program because of an agreement with the National Air Traffic Controllers Association (NATCA) that establishes a baseline staffing level of 15,000 FAA controllers through 2001. FAA agreed to increase that level by an additional 2 percent each year for the remaining 2 years of the agreement.

While the decision to expand the Contract Tower Program is ultimately a policy determination that Congress will have to weigh, FAA's study did not adequately consider several key factors of the feasibility, costs, and benefits of expanding the Program that should be further analyzed and reported to Congress.

First. FAA's methodology for determining which towers to consider did not accurately reflect the feasibility of expanding the Program. For purposes of its study, FAA narrowly defined the congressional request to evaluate FAA towers "without radar capability" and concluded that only 41 of its 71 VFR towers met the definition of Congress. FAA excluded the remaining 30 towers from consideration because those facilities are equipped with a monitoring device known as DBRITE (Digital Bright Radar Indicator Tower Equipment) and provide limited instrument flight rule services (IFR) through a letter of agreement (LOA) with a larger radar-equipped facility. DBRITE is a display monitor used by controllers at towers to identify and monitor aircraft – it is not a radar system and is not used in the radar control of air traffic.

We do not agree that those factors are reasonable causes for including or excluding towers from consideration. For example, there are currently as many as 40 towers in the existing Contract Tower Program that also are equipped with DBRITE displays and provide similar IFR services through LOAs with larger FAA facilities.

In addition, FAA's methodology went too far in considering some busier towers and not far enough in considering other towers with substantially lower levels of air traffic activity. For example, FAA included Pontiac/Oakland International Airport for consideration (even though this airport is among FAA's 50 busiest towers) because the facility is not equipped with a DBRITE and does not have an LOA to provide IFR operations. In contrast, FAA excluded Allegheny County Airport from consideration because the facility is equipped with a DBRITE and has an LOA for IFR operations even though this airport has an average air traffic count that is substantially less than many towers in the existing Program. FAA's experience in contract towers has primarily been with towers that have lower levels of air traffic activity.

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FAA needs a more comprehensive means for determining the extent that the Program could be expanded by taking into account factors such as volume of air traffic, types of users, and complexity of operations at each location. As part of its collective bargaining agreement with NATCA in 1998, FAA developed a new pay system for controllers based on reclassifying all its air traffic control (ATC) facilities. The new system establishes ATC Grades 3 through 12 based on the complexity of operations, the types of users, and the volume of air traffic at each location. FAA's 71 VFR towers were reclassified into ATC Grades 5 through 9.

In our opinion, the ATC Grades of the 71 towers could provide FAA a more comprehensive means for evaluating which facilities to consider. Additionally, should Congress choose to expand the Contract Tower Program, FAA will need to develop specific metrics for analyzing and reporting actual results of the Program's expansion (on a facility-by-facility basis) to ensure that system safety and efficiency are not impacted and that projected benefits are being fully realized.

Second. FAA's estimated cost savings were understated because the agency used FY 1998 cost figures. In FY 1999, costs to operate FAA towers increased as a result of the new pay system for FAA controllers. We estimate that annual average savings would be approximately \$881,000 per tower. However, these savings would be subject to several offsetting expenses. For example, FAA would incur a one-time expense to relocate FAA controllers who elect to move from contracted facilities to other FAA facilities. According to FAA's FY 2001 budget submission to Congress, this cost was approximately \$49,000 per move in FY 1999 for the Air Traffic Control division.

Third. FAA's conclusion did not consider important long-term benefits that could accrue from expanding the Program. To have credibility, FAA's study should have given much greater weight to the potential impact that controllers from contracted VFR towers could have in offsetting future increases in system demand and addressing existing staffing shortfalls. Contracting additional VFR tower operations would allow FAA to redistribute controllers from contracted locations (or their equivalent full-time positions) to FAA locations with the greatest forecast increases in air traffic activity. Experienced FAA controllers from contracted locations could also help alleviate existing staffing shortfalls which, in turn, could reduce FAA's overtime costs.

These benefits would be achievable while maintaining a workforce of 15,000 FAA controllers as specified in the agreement with NATCA. However, it is important to note that the agreement states “. . . its terms and conditions are subject to congressional approval.”

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It is essential that FAA thoroughly analyze any and all opportunities to offset the rising costs of its operations. Expanding the Contract Tower Program provides the agency with one such opportunity. FAA should revise its study of expanding the Contract Tower Program to fully recognize the feasibility, costs, and benefits that expanding the Program offers. Revisions should include better methodology for determining which towers to consider, new savings estimates, and further evaluation of the benefits that controllers from contracted locations could provide in meeting projected growth in air traffic activity.

Principal Findings

The Current Contract Tower Program

Safety. As part of our review, we conducted tests on issues similar to those we identified in our 1998 report on the Contract Tower Program. We found that contract towers continue to be operated as safely as FAA-operated towers. For example, we found that the level of operational errors in FY 1999 at contract towers (.05 errors per 100,000 operations) was similar to the level of operational errors at comparable FAA VFR towers (.06 errors per 100,000 operations). In addition, we reviewed facility evaluation reports conducted by FAA's Evaluations Branch for a sample of 34 contract towers and found that none of the evaluations noted any significant safety issues at the contract towers.

Staffing. We also conducted a follow-up review of staffing issues noted in our 1998 report. We reviewed contractor payroll records for a sample of approximately 4 biweekly pay periods (2 months) in 1999 for 37 contract towers and compared the number of employees and hours provided by the contractors to the staffing requirements contained in their respective contracts. We found that contractors (in total) provided the required number of employees and hours within 2 percent of the contractual requirements.

In addition, we found that FAA's new contract solicitation contains specific provisions requiring contractors to report and certify monthly the number of controllers at each location and the hours they worked. These procedures should help ensure that contractors adhere to required facility-staffing plans under the new contract.

Users. Lastly, we discussed the Contract Tower Program and its proposed expansion with users at contract locations and at proposed locations. Users at contract locations continue to be supportive of the Contract Tower Program and believe the services they receive are comparable to FAA-operated towers. Based

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on their experiences with the Contract Tower Program, these users felt that expanding the Program to other FAA VFR towers would be feasible. At proposed locations, most users were concerned only that the level of service they receive would remain the same if their towers were converted to contract operations.

However, other users were strictly opposed to expanding the Program. For example, one airport director told us that he used the fact that his tower was operated by the FAA as a marketing tool to attract foreign air carriers and encourage commercial service. Other groups, such as NATCA, oppose expanding the Program for other reasons. NATCA believes that expanding the Program to busier FAA VFR towers would represent a serious departure from confines of the existing Program because the number and complexity of operations at FAA's 71 VFR towers are significantly higher than operations at current contract towers.

While 15 of FAA's 71 VFR towers are busier than towers in the existing Program, the remaining 56 VFR towers have, in our opinion, operations that are comparable to towers in the existing Program. These differences underscore the complexities involved in evaluating the feasibility of expanding the Contract Tower Program. They also underscore the need for FAA to develop specific metrics for analyzing actual results of the Program's expansion to ensure that system safety and efficiency are not affected.

FAA's Study of Expanding the Contract Tower Program

FAA completed a draft study of expanding the Contract Tower Program in September 1999, but as of April 2000, had not issued a final report to Congress. In its study, FAA concluded that no savings would be realized from expanding the Program because of an agreement with NATCA that establishes a baseline staffing level of 15,000 FAA controllers. However, FAA's study did not adequately consider several key factors of the feasibility, costs, and benefits of expanding the Program that should be further analyzed and reported to Congress. These include developing better methodology for considering which towers to convert, and evaluating additional cost savings and other benefits that expanding the Program could offer.

Methodology. FAA narrowly defined the congressional request to evaluate FAA towers "without radar capability" and included only 41 of its 71 VFR towers in its study. FAA concluded that the remaining 30 towers did not meet the definition of Congress because those facilities are equipped with a monitoring device known as DBRITE and provide limited IFR services through an LOA with a larger radar-equipped facility. We do not agree that those factors are reasonable causes for

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including or excluding towers from consideration. For example, there are currently as many as 40 towers in the existing Contract Tower Program that also are equipped with DBRITE displays and provide similar IFR services through LOAs with larger FAA facilities.

In addition, FAA's methodology went too far in considering some busier towers and not far enough in considering other towers with substantially lower levels of air traffic activity. For example, FAA included Pontiac/Oakland International Airport for consideration (even though this airport is among FAA's 50 busiest towers) because the facility is not equipped with a DBRITE and does not have an LOA for IFR operations. In contrast, FAA excluded Allegheny County Airport from consideration because the facility is equipped with a DBRITE and has an LOA for IFR operations even though this airport has an average air traffic count of only about 28 aircraft per hour (less than many towers in the existing Program).

In 1998, FAA reclassified all its air traffic control facilities into ATC Grades 3 through 12 based on numerous factors including the complexity of operations, types of users, and the volume of air traffic handled at each location. For example, under FAA's old grade structure, Chicago O'Hare and JFK International were both classified as Level V facilities but in 1998 were reclassified as ATC Grades 12 and 10, respectively.

Although FAA's 71 VFR towers were reclassified into ATC Grades 5 through 9, FAA did not use ATC Grades to determine which facilities to include in its study. As a result, FAA did not consider important differences about the 71 VFR towers such as the volume of air traffic they control, the types of users they serve, and complexity of operations they manage. For example, the average hourly traffic density at the 71 towers ranges from 28 aircraft per hour to over 118 aircraft per hour – 11 of the 71 towers are among FAA's 50 busiest towers. One tower, Van Nuys, California, (an ATC Grade 9) is the fifth busiest air traffic control tower in the country – busier than towers such as Miami International, Detroit Metropolitan, and Boston Logan.

In our opinion, the ATC Grades of the 71 towers offer Congress and FAA a more comprehensive means for evaluating which facilities to consider by taking into account factors such as the volume of air traffic, the types of users, and the complexity of operations at each location. Additionally, should Congress choose to expand the Contract Tower Program, FAA will need to develop specific metrics for analyzing and reporting actual results of the Program's expansion (on a facility-by-facility basis) to ensure that system safety and efficiency are not affected and that projected benefits are being fully realized.

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Estimated Savings. FAA estimated that the agency would realize average annual savings of about \$787,000 per facility by expanding the Program. FAA's estimate was based on a framework using Office of Management and Budget Circular A-76 requirements for cost comparisons. We tested the costs used in FAA's estimate and found that the underlying data were reasonable. However, FAA's estimates were developed using FY 1998 costs. In FY 1999, the costs of operating FAA towers increased as a result of the new pay system for FAA controllers.

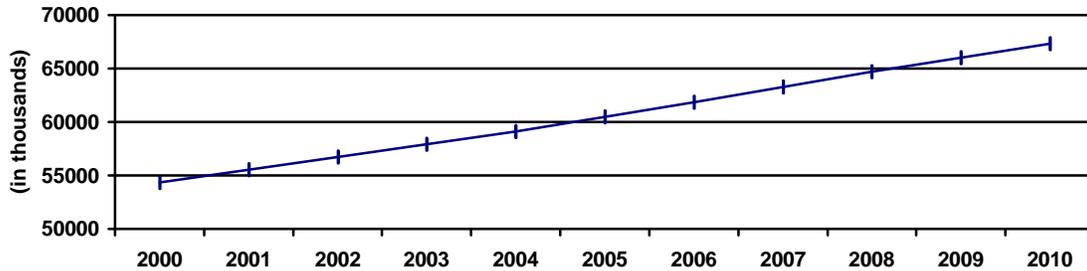
Using FAA's methodology and actual contract and agency costs for FY 1999, we estimate that annual average savings could be approximately \$881,000 per tower. (Exhibit C provides details of these estimates.) These savings would be subject to several offsetting expenses, however. For example, FAA would incur a one-time expense to relocate FAA controllers who elect to move from contracted facilities to other FAA facilities. According to FAA's FY 2001 budget submission to Congress, this cost was approximately \$49,000 per move in FY 1999 for the Air Traffic Control division.

FAA's Conclusions. In its study, FAA concluded that no savings could be realized from expanding the Contract Tower Program because of a July 1998 Memorandum of Agreement between FAA and NATCA. Article I of that agreement establishes a baseline staffing level of 15,000 controllers for FYs 1999 through 2001, increasing by an additional 2 percent each year for the remaining 2 years of the agreement. FAA agreed to maintain those numbers when attrition, transfers, or promotions reduced those levels. As a result of those requirements, FAA concluded there could be no net savings from expanding the Program because the agreement prohibits a decrease in the number of FAA personnel.

FAA's conclusion is based on a premise that there could be no savings from expanding the Contract Tower Program because the agency would have to increase the costs of the Program while maintaining the same level of FAA controllers. However, FAA's conclusion ignores other long-term benefits that would accrue from expanding the Program. For example, controllers from contracted towers could have a significant impact in meeting projected increases in air traffic demand. As shown in the following graph, FAA is forecasting aircraft operations at airports with FAA-operated air traffic services to increase from about 54 million in 2000 to over 67 million in 2010 – an increase of over 24 percent.

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Forecast Aircraft Operations at Airports with FAA-Operated Air Traffic Services



FAA's study should have given greater merit to the potential impact that controllers from contracted VFR towers could have in offsetting potential future increases in system demands. Contracting out additional VFR tower operations would allow the agency to redistribute controllers (or their equivalent full-time positions) from contract locations to FAA locations with the greatest forecast increases.

Experienced controllers from the 71 facilities would also reduce FAA's projected hiring needs thus reducing costs associated with training newly hired controllers. FAA spends approximately \$47,000 per employee to provide newly hired controllers initial air traffic control training. According to FAA officials, the agency is projecting to hire approximately 2,000 new controllers over the next 4 years.

In addition, experienced FAA controllers from contracted locations could help alleviate existing staffing deficiencies. For example, as of December 1999, the Los Angeles International Airport tower was understaffed by eight controllers. If the Program were expanded, the 13 controllers assigned to the Santa Monica tower (or their equivalent full-time positions) could be reassigned to Los Angeles International to address that facility's staffing needs. Actions such as these would also help FAA reduce overtime expenditures at understaffed facilities. In FY 1999, FAA incurred over \$19 million in overtime costs to meet operational needs at its air traffic control facilities.

FAA should more carefully examine the potential benefits that expanding the Contract Tower Program could provide in addressing staffing deficiencies and ensuring that FAA has sufficient resources at key locations to meet projected increases in air traffic activity.

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Recommendations

We recommend that FAA revise its draft study of expanding the Contract Tower Program to provide Congress a better perspective of the feasibility, costs, and benefits of expanding the Program. Revisions to the study should, at a minimum, include:

- a new listing of towers that could be contracted using FAA ATC Grades as the methodology for determining which towers to consider;
- new cost savings estimates using FY 1999 actual contract and agency costs; and
- evaluation of the potential benefits that controllers from contracted towers could provide in addressing staffing imbalances and ensuring that the agency has sufficient resources at key locations to meet projected increases in demand.

Additionally, should Congress choose to expand the Contract Tower Program, we recommend that FAA develop specific metrics for analyzing and reporting actual results of the Program's expansion (on a facility-by-facility basis) to ensure that system safety and efficiency are not impacted and that projected benefits are being fully realized.

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Findings and Recommendations

The Current Contract Tower Program

The Federal Aviation Administration's (FAA) Contract Tower Program (Program) has proven successful in providing air traffic control services at low activity airports at lower costs than the agency could otherwise provide. The Program also provides service at towers that FAA would otherwise not have staffed because they were too expensive to operate. According to FAA, significant cost savings have been achieved, air traffic services have been maintained without derogating safety, and the quality of service to the customer has been maintained at a high level. In its study of expanding the Contract Tower Program, FAA states:

Services provided at a [contract tower] are identical to those provided at an FAA-staffed [tower]. Contract air traffic controllers are certified by FAA and must follow appropriate Code of Federal Regulations and FAA directives. The change to contractor-provided air traffic control services is transparent to users.

In 1998, we conducted a comprehensive review of the Contract Tower Program and came to many of the same conclusions as FAA. We found little difference in the quality or safety of services provided at Level I towers whether they were operated by FAA or by contractors. Specifically, we found that (1) contract controllers met qualification requirements; (2) contract controllers received required training; (3) users were satisfied with contract tower services; and (4) the number and types of incidents at FAA and contract towers were comparable.

We also found that the Contract Tower Program reduced FAA's operations costs. The current Contract Tower Program saves the agency about \$250,000 per tower, annually. However, we found that some contract towers were not staffed in accordance with contract terms.

We recommended that FAA closely monitor contract tower staffing levels. This was necessary because (1) contract towers are staffed with fewer controllers than FAA-operated towers, and (2) staffing levels were based on contractor-prepared staffing plans. FAA agreed to those plans because the agency does not have precise standards for estimating staffing requirements for individual facilities.

As part of our current review, we conducted tests similar to those we did in 1998. Specifically, we wanted to determine (1) if the Program continues to operate safely, (2) if previously identified staffing issues have been addressed, and (3) if users continue to be satisfied with the Program.

Safety. Contract towers continue to be operated as safely as FAA-operated towers. For example, we found that the level of operational errors and deviations in Fiscal Year (FY) 1999 at contract towers (.05 per 100,000 operations) was similar to the level of incidents at a sample of comparable FAA visual flight rules (VFR) towers¹ (.06 per 100,000 operations).

In addition, we reviewed a sample of facility evaluation reports conducted by FAA’s Evaluations Branch for contract towers. The Evaluations Branch conducts extensive biennial full-facility reviews of all air traffic facilities. Our sample included the most recent evaluations conducted at 34 contract towers. None of the evaluations we reviewed noted any significant safety issues at the contract towers.

Staffing. We also conducted a follow-up review of staffing issues noted in our 1998 audit. We reviewed contractor payroll records for a sample of approximately 4 biweekly pay periods (2 months) in 1999 for 37 contract towers. We then compared the number of employees and hours provided by the contractors to the staffing requirements contained in their respective contracts. As shown in the following table, we found that contractors (in total) provided the required number of employees and hours within 2 percent of the contractual requirements.

STAFFING SAMPLE RESULTS BY CONTRACTOR

Company	Controllers*			Hours per Pay Period			
	Pay Records	Contract Terms	Difference	Pay Records	Contract Terms	Difference	%
1	268	268	0	19,868	20,220	(352)	(2)%
2	196	190	6	13,737	13,664	73	1%
3	300	300	0	21,304	21,492	(188)	(1)%

*These figures represent the total number of controller pay records for 4 biweekly pay periods in our sample. They do not reflect the actual number of controllers employed at the towers reviewed.

FAA has also specifically addressed facility-staffing variances in its new contract solicitation. The new contract contains three provisions addressing staffing issues that should strengthen the agency’s oversight of the Contract Tower Program. First, the new contract requires the contractor to submit a monthly report to the FAA Contract Tower Program Office including such items as total hours worked and the number of facility-rated controllers working each month.

Second, the new contract addresses overstaffing and understaffing at facilities. If a contract tower is overstaffed by more than 3 percent above the agreed upon staffing plan, without prior approval from the FAA contracting officer, the agency

¹ Our sample included only FAA towers in ATC Grades 5 and 6, which are most similar to the operations at towers in the existing Contract Tower Program.

could deny payment to the contractor for the hours worked that exceeded the staffing plan. Similarly, FAA could recoup any payments made to the contractor if a facility were understaffed by 3 or more percent. Third, under the new contract, the contractor must certify that the hours billed under the contract are the actual hours worked during each quarter.

These reports should enable the Contract Tower Program Office to track hours of service provided by the contractor and verify that the contractually specified staffing standards are met. FAA will also be able to adjust payments made to the contractor based on the hours of service provided and billed to FAA. For these procedures to be effective, however, FAA will need to periodically audit the reported data on a more frequent basis and ensure that penalties for noncompliance are clear and strictly enforced.

User Perspectives. We discussed the Contract Tower Program and its proposed expansion with users at contract locations, at proposed locations, and with outside organizations. We found that users at contract locations continue to be supportive of the Contract Tower Program. In general, these users told us that the services they receive from contractors are comparable to FAA-operated towers and that they were satisfied with the overall quality and safety of contract operations. Based on their experiences with the Contract Tower Program, these users felt that expanding the Program to other FAA VFR towers would be feasible. At proposed locations, most users were concerned only that the level of service they receive would remain the same if their towers were converted to contract operations.

However, other users were strictly opposed to expanding the Program. For example, one airport director told us that he used the fact that his tower was operated by the FAA as a marketing tool to attract foreign air carriers and encourage commercial service. Other groups, such as the National Air Traffic Controllers Association (NATCA), oppose expanding the Program. NATCA believes that expanding the Program to busier FAA VFR towers would represent a serious departure from the existing Program because the number and complexity of operations at FAA's 71 VFR towers are significantly higher than operations at current contract towers.

While 15 of FAA's 71 VFR towers are busier than towers in the existing Program, the remaining 56 VFR towers have, in our opinion, operations that are comparable to towers in the existing Program. These differences underscore the complexities involved in evaluating the feasibility of expanding the Contract Tower Program. They also underscore the need for FAA to develop specific metrics for analyzing actual results of the Program's expansion to ensure that system safety and efficiency are not affected.

FAA's Study of Expanding the Contract Tower Program

FAA completed a draft study of expanding the Contract Tower Program in September 1999, but as of April 2000 had not issued a final report to Congress. In the draft study FAA concluded that no net savings would be realized from further expanding the Program because of an agreement with NATCA that establishes a baseline staffing level of 15,000 FAA controllers.

While the decision to expand the Contract Tower Program is ultimately a policy determination that Congress will have to weigh, FAA's study did not adequately consider several key factors of the feasibility, costs, and benefits of expanding the Program that should be further analyzed and reported to Congress. These include developing better methodology for considering which towers to convert, and evaluating additional cost savings and other benefits that could be realized from expanding the Program.

1. Better Methodology Is Needed for Considering Which Towers to Convert

FAA narrowly defined the congressional request to evaluate FAA towers "without radar capability." For purposes of its study, FAA defined 41 of the 71 VFR towers as meeting the congressional definition. FAA excluded the remaining 30 towers from the study because those facilities were equipped with a monitoring device known as DBRITE² and provided limited instrument flight rule (IFR) services through a letter of agreement (LOA) with a larger radar-equipped facility.

We do not agree that those factors are reasonable causes for including or excluding towers from consideration. For example, there are currently as many as 40 towers in the existing Contract Tower Program that also are equipped with DBRITE displays and provide similar IFR services through LOAs with larger FAA facilities.

We observed operations at 15 of the contract towers with LOAs and compared their operations to 12 of the 30 FAA towers excluded from the study. We concluded that, other than the level of air traffic activity, there were no differences in the nature or types of operations conducted at those facilities.

The methodology FAA used would also result in some lower activity towers being excluded from consideration while busier and larger facilities would be considered for conversion to contract operations. For example, using FAA's methodology,

² DBRITE (Digital Bright Radar Indicator Tower Equipment) is a display monitor used by controllers at towers to identify aircraft and monitor their position. DBRITE is not a radar system and is not used in radar control of air traffic.

Ann Arbor Municipal Airport (with an average air traffic count of **43 aircraft per hour**) would be excluded from consideration because the facility is equipped with a DBRITE and has an LOA for IFR operations with a larger FAA facility. In contrast, Pontiac/Oakland International Airport (with an average air traffic count of **76 aircraft per hour**) would be considered for conversion because the facility is not equipped with DBRITE and does not have an LOA for IFR operations with another FAA facility.

Significant Differences Among FAA's 71 VFR Towers Need to Be Considered.

The methodology used by FAA did not adequately consider important differences about the 71 VFR towers. Unlike most towers in the Contract Tower Program which are relatively similar (primarily low activity general aviation airports), FAA's 71 VFR towers are not a homogeneous group. These facilities have significant differences in the volume of air traffic they control, the number and types of users they serve, and the complexity of the airspace they manage. For example, the average hourly traffic density at the 71 VFR towers ranges from 28 aircraft per hour to over 118 aircraft per hour. One VFR tower, Van Nuys, California, is the fifth busiest air traffic control tower in the country. In all, 11 of the 71 VFR towers are among FAA's top 50 busiest air traffic control towers in the United States.

The mix and types of users at the 71 locations also vary extensively. For example, many of these towers handle only general aviation aircraft while others have daily commercial jet service. For example, Long Beach, California, has daily domestic service from American and America West Airlines, and Orlando Sanford, Florida, has regularly scheduled international service from Europe.

Finally, the complexity of the airspace controlled varies among the 71 VFR towers. Several towers have relatively simple and open airspace while others must interact extensively with larger and busier airports. For example, Orlando Executive's airspace lies directly under a major approach and departure path for Orlando International Airport. These factors, at a minimum, should be included in any criteria used to determine which facilities should or should not be considered for conversion to contract operations.

FAA ATC Grades Could Provide a Better Means for Evaluating Towers.

Although many of the differences between FAA's 71 VFR towers have already been taken into account under FAA's reclassification efforts, FAA did not use ATC Grades in determining which towers to consider. In 1998, FAA reclassified all its air traffic control facilities into ATC Grades 3 through 12 based on various factors including the volume of air traffic and complexity of operations at each location.

Under the new system, facilities that were previously rated at the same level may have been reclassified into different ATC Grades. For example, under FAA's old classification system, air traffic control towers at the Chicago O'Hare and John F. Kennedy airports were classified as Level V facilities, but under the new system the facilities were reclassified as ATC Grades 12 and 10, respectively. As shown in the following table, the 71 VFR towers have been reclassified into ATC Grades 5 through 9.

ATC GRADES OF FAA's 71 VFR TOWERS

ATC GRADE	TOWERS	CONTROLLERS*
5	10	110
6	25	301
7	28	372
8	4	75
9	4	101
Total	71	959

*As of December 1999.

In our opinion, the ATC Grades of the 71 towers offer Congress and FAA a more comprehensive means for evaluating which facilities to consider by taking into account factors such as the volume of air traffic, the types of users, and the complexity of operations at each location. Additionally, should Congress choose to expand the Contract Tower Program, FAA will need to develop specific metrics for analyzing and reporting actual results of the Program's expansion (on a facility-by-facility basis) to ensure that system safety and efficiency are not affected and that projected benefits are being fully realized.

II. Additional Cost Savings Could be Realized by Expanding the Program

FAA estimates that contracting out its VFR towers could result in average annual savings of approximately \$787,000 per facility. FAA's cost comparison was conducted by averaging the annual costs of 12 facilities with high air traffic density already in the Contract Tower Program with 12 of the 71 FAA facilities with similar density counts. FAA's methodology was based on a framework using Office of Management and Budget Circular A-76 requirements for cost comparisons. We tested the costs used in FAA's estimate and found that the underlying data were reasonable.

The estimated savings from expanding the Contract Tower Program could be greater, however. FAA's estimates were based on using FY 1998 costs. In FY 1999, FAA salary costs increased as a result of a new pay system for FAA controllers, which in turn increased the costs of operating FAA towers.

OIG Estimated Savings. Using FAA's methodology and actual contract and agency costs for FY 1999, we recalculated the potential savings of expanding the Contract Tower Program. We estimate that annual average savings could be as much as \$881,000 per tower, or approximately \$62.5 million if all 71 VFR towers were contracted out.

The cost of operating FAA's 71 towers will increase further as a result of new pay differential for FAA controllers. In November 1999, FAA and NATCA agreed to implement a Controller Incentive Pay for controllers at high-cost-of-living locations. FAA controllers at 30 of the 71 locations began receiving an additional pay differential between 5 and 10 percent in FY 2000.

Contract Costs May Be Higher Than Estimated. Actual contract costs may be higher than the average used in FAA's estimate for several reasons.

- First, contractors would have to staff some of the 71 FAA facilities with more controllers than they use at existing contract towers because of the higher levels of air traffic activity.
- Second, contractors would most likely have to develop a tiered pay system (like FAA's pay system for controllers) to attract and retain qualified contract controllers at facilities that are busier and more complex than towers in the existing Program.
- Third, because of the complexity of some of the FAA facilities, contract controllers would require more time to become facility certified than controllers in the current Program require. FAA and contract officials estimated it would require controllers between 60 and 90 days to qualify. During this period, FAA incurs costs of the contract as well as the salary costs for FAA employees.
- Lastly, FAA would incur a one-time cost to relocate FAA controllers from contracted out facilities to other FAA facilities. According to FAA's FY 2001 budget submission to Congress, this cost was approximately \$49,000 per move in FY 1999 for the Air Traffic Control division. It is important to note, however, that not all controllers would relocate. Some controllers would retire, some would choose to work for the contractors, and others could be reassigned to nearby FAA facilities that would not require them to relocate.

FAA's Contract Tower Program Office is aware of each of these issues and is making plans to address them should the Contract Tower Program be expanded.

III. Other Benefits Should Be Considered

FAA concluded that there would be no savings realized from expanding the Contract Tower Program because of a July 1998 Memorandum of Agreement between FAA and NATCA. Article I of that agreement establishes a baseline staffing level of 15,000 controllers for FYs 1999 through 2001, increasing by 2 percent in FYs 2002 and 2003. The agreement states:

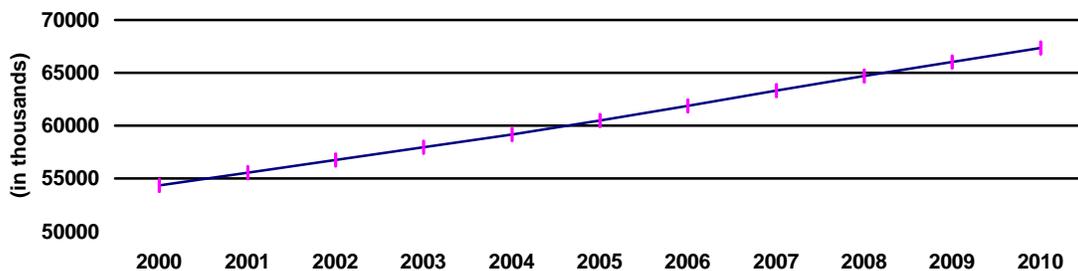
The agency will backfill in order to maintain these numbers when attrition, transfers, or promotions reduce the staffing below the agreed upon numbers.

As a result, FAA concluded that there could be no net savings from expanding the Contract Tower Program because the agreement prohibits a decrease in the number of FAA personnel. However, this conclusion is based on only one possible outcome of expanding the Program. FAA should have more adequately considered several other options before arriving at that conclusion.

Other Considerations. While the agreement with NATCA may represent an expression of policy between the agency and union and reflect their objectives, Congress is not bound by its terms. In providing funding to and authorizing the programs and activities of FAA, Congress may exercise its constitutional prerogative by modifying the provisions or the underlying assumptions of the agreement.

Other Benefits. More importantly, other long-term benefits would accrue from expanding the Program regardless of the agreement with NATCA. Controllers from contracted towers could have a significant impact in meeting projected increases in air traffic demand. As shown in the following graph, FAA is forecasting aircraft operations at airports with FAA-operated air traffic services to increase from about 54 million operations in 2000 to over 67 million operations in 2010 – an increase of over 24 percent.

Forecast Aircraft Operations at Airports with FAA-Operated Air Traffic Services



FAA's study should have given greater merit to the potential impact that controllers from contracted VFR towers could have in offsetting potential future increases in system demands. Contracting out additional VFR tower operations would allow the agency to redistribute controllers (or their equivalent full-time positions) from contract locations to FAA locations with the greatest forecast increases.

Reassigning controllers from the 71 facilities would also reduce FAA's projected hiring needs thus reducing costs associated with training newly hired controllers. FAA spends approximately \$47,000 per employee to provide newly hired controllers initial air traffic control training. According to FAA officials, the agency is planning to hire over 2,000 new controllers over the next 4 years.

Experienced FAA controllers from contracted locations could also help alleviate existing staffing deficiencies. For example, as of December 1999, the Los Angeles International Airport tower was understaffed by eight controllers. If the Program were expanded, the 13 controllers assigned to the Santa Monica tower (or their equivalent full-time positions) could be reassigned to Los Angeles International and address that facility's staffing needs. Actions such as these would also help FAA reduce overtime expenditures at understaffed facilities. In FY 1999, FAA incurred over \$19 million in overtime costs to meet operational needs.

FAA should more carefully examine the potential benefits that expanding the Contract Tower Program could provide in addressing existing staffing deficiencies and ensuring that FAA has sufficient resources at key locations to meet projected increases in demand.

Recommendations

We recommend that FAA:

1. Revise its draft study of expanding the Contract Tower Program to provide Congress a better perspective of the feasibility, costs, and benefits of expanding the Program. Revisions to the study should, at a minimum, include:
 - a new listing of towers that could be contracted using FAA ATC Grades as methodology for determining which towers to consider;
 - new cost savings estimates using FY 1999 actual contract and agency costs; and
 - an evaluation of the potential benefits that controllers from contracted towers could provide in addressing staffing deficiencies and ensuring that the agency has sufficient resources at key locations to meet projected increases in air traffic activity.
2. Develop specific metrics for analyzing and reporting actual results of expanding the Program (on a facility-by-facility basis) to ensure that system safety and efficiency are not impacted should Congress choose to expand the Program.

71 VFR Towers Considered in FAA's Report to Congress on the Contract Tower Program

ATC Grade 5 VFR Towers

State	Airport	Density <small>As of 11/99, unless noted</small>	Staffing <small>As of 12/31/99</small>	Excluded in FAA's Study	Controller Incentive Pay
AK	Juneau International	39.98	10	No	0.0%
AZ	Grand Canyon Municipal	56.59	10	No	0.0%
CA	El Monte	36.23	10	No	8.0%
CA	Napa County	42.19	11	No	5.5%
CA	Santa Rosa Sonoma	35.88	12	No	5.5%
FL	Fort Pierce	38.14	13	No	0.0%
IN	Lafayette/Perdue University	45.29	11	No	0.0%
MI	Ann Arbor Municipal	43.10	12	Yes	5.0%
MI	Traverse City	35.55 (10/99)	9	No	0.0%
VA	Manassas Regional/Davis Field	27.89	12	No	5.5%
ATC-5 Staffing			110		

ATC Grade 6 VFR Towers

AZ	Scottsdale	48.55	14	No	0.0%
CA	Camarillo	45.33	11	No	8.0%
CA	Concord/Buchanan Field	52.50	9	No	8.0%
CA	Hayward Air Terminal	45.65	11	No	8.0%
CA	Livermore Municipal	60.30	10	No	8.0%
CA	Sacramento International	31.70	15	Yes	0.0%
CA	San Jose/Reid-Hillview	48.56	9	No	8.0%
CO	Denver/Jeffco	38.32	15	No	0.0%
DE	Wilmington/New Castle	33.06	12	No	0.0%
FL	Miami/Kendall-Tamiami	47.30	13	Yes	0.0%
FL	Vero Beach	50.98	14	No	0.0%
IL	Cahokia/St. Louis	49.22	12	Yes	0.0%
IL	Chicago/Aurora Municipal	33.74	13	No	5.5%
KY	Louisville Bowman	38.29	11	Yes	0.0%
LA	New Orleans/Lakefront	40.91	11	Yes	0.0%
MI	Detroit Willow Run	37.28 (10/99)	12	Yes	4.5%
MN	Minneapolis/Crystal	48.51	11	Yes	0.0%
MN	St. Paul Downtown	39.61	12	No	0.0%
MO	Spirit of St. Louis	47.19	14	Yes	0.0%
NY	Poughkeepsie/Dutchess	33.43	8	No	0.0%
OR	Portland-Hillsboro	55.94	10	No	0.0%
PA	Northeast Philadelphia	48.86	12	No	5.5%
PA	Pittsburgh/Allegheny County	28.33	14	Yes	0.0%
TX	Fort Worth/Alliance	49.78	17	Yes	0.0%
WA	Everett Paine Field	57.75	11	No	0.0%
ATC-6 Staffing			301		

ATC Grade 7 VFR Towers

State	Airport	Density <small>As of 11/99, unless noted</small>	Staffing <small>As of 12/31/99</small>	Excluded in FAA's Study	Controller Incentive Pay
AK	Anchorage/Merril Field	49.36	12	No	0.0%
AZ	Mesa/Falcon Field	56.67	13	No	0.0%
AZ	Phoenix-Deer Valley Municipal	63.74	15	No	0.0%
AZ	Prescott/EA Love Field	89.72	18	No	0.0%
CA	Carlsbad/McClellan	62.55	14	No	5.5%
CA	Chino	44.56	10	No	4.5%
CA	La Verne/Bracket Field	59.97	11	No	8.0%
CA	Palo Alto	47.99	10	No	8.0%
CA	San Diego/Gillespie Field	49.46	12	No	5.5%
CA	San Diego/Montgomery	58.04	16	No	5.5%
CA	Santa Monica Municipal	53.44	13	Yes	8.0%
CA	Torrance/Zamperini Field	51.55	10	No	8.0%
FL	Fort Lauderdale Executive	48.66 (9/99)	15	Yes	0.0%
FL	Orlando Executive	45.17	11	Yes	0.0%
GA	Atlanta/Dekalb-Peachtree	50.52	16	Yes	0.0%
IL	Chicago/Du Page	46.57 (10/99)	16	Yes	5.5%
IL	Chicago/Palwaukee Municipal	38.36	14	Yes	5.5%
MA	Bedford/Hanscom Field	46.45	13	Yes	8.0%
MA	Nantucket Memorial	39.75	9	Yes	8.0%
MN	Minneapolis/Flying Cloud	50.42	14	No	0.0%
ND	Grand Forks International	57.26	16	Yes	0.0%
NJ	Caldwell/Essex County	56.52	13	No	5.5%
NJ	Morristown Municipal	56.99	11	No	5.5%
NV	North Las Vegas	51.55	17	Yes	0.0%
NY	Farmingdale/Republic	57.75	12	No	8.0%
TX	Dallas Addison	36.48	15	Yes	0.0%
TX	Tomaball D. W. Hooks	62.02	13	Yes	0.0%
VA	Newport News	48.28	13	No	0.0%
ATC-7 Staffing			372		

ATC Grade 8 VFR Towers

FL	Orlando/Sanford	78.11	18	Yes	0.0%
MI	Pontiac/Oakland Ct'y Internat'l	76.22 (6/99)	17	No	5.5%
OK	Tulsa/Riverside	70.77	17	Yes	0.0%
WA	Seattle/Boeing Field	72.68	23	Yes	5.5%
ATC-8 Staffing			75		

ATC Grade 9 VFR Towers

CA	Long Beach/Daugherty	97.80	29	Yes	8.0%
CA	Van Nuys	118.35	23	Yes	8.0%
CO	Denver/Centennial	97.45	24	Yes	0.0%
TX	Fort Worth Meacham	75.97	25	Yes	0.0%
ATC-9 Staffing			101		
Total Staffing			959		

Scope and Methodology

This review was conducted between October 1999 and February 2000. Exhibit D lists the activities we visited or contacted during the audit. We conducted the audit in accordance with Government Auditing Standards prescribed by the Comptroller General of the United States and included such tests as we considered necessary to provide reasonable assurance of detecting abuse or illegal acts. Our methodology was designed around answering the following four questions.

Were previously identified staffing problems in the Federal Contract Tower Program corrected? To address this question, we conducted a follow-up review of staffing issues noted in our 1998 audit. We selected a judgmental sample of 37 towers and reviewed a sample of controller payroll records for approximately 4 biweekly pay periods (2 months) in 1999. We then compared the number of controllers and hours provided to staffing requirements. We also reviewed the new contract solicitation to assess FAA's procedures for oversight of contractor compliance. In addition, we reviewed a sample of the most recent facility evaluation reports conducted by FAA's Evaluations Branch.

Is FAA's claim that towers with a DBRITE and an LOA for IFR operations cannot be contracted a valid assertion? To address this question, we selected and visited a total of 27 towers (12 of the 71 FAA VFR towers and 15 contract towers). At these towers, two members of our staff (former air traffic controllers) observed air traffic operations to determine if there was a discernible difference in operations justifying excluding certain FAA towers from contract consideration. In addition, we interviewed airport management officials and users to determine if services received at contract towers are comparable to FAA-operated towers.

Were all costs and estimates used in FAA's study reasonable? To address this question, we reviewed the methodology FAA used for estimating the average annual savings. We compared FAA's methodology to Office of Management and Budget Circular A-76 requirements for cost comparisons. We also traced to source documents a sample of the costs used by FAA to determine if the underlying data were accurate. Using FY 1999 cost data and FAA's methodology, we calculated the potential average cost savings for the contract towers and FAA-operated towers.

What other costs and benefits should have been considered in FAA's study? To address this question, we reviewed FAA's FYs 1999 and 2000 budget requests to identify other cost factors that would be impacted by expanding the Contract Tower Program. These include projected increases in air traffic activity, overtime costs, training costs for new controllers, and average relocation costs. We also interviewed FAA officials responsible for training, staffing, and hiring.

Comparison of Potential Cost Savings for FY 1998 and FY 1999

FY 1998 Cost Comparison				FY 1999 Cost Comparison			
<u>FAA Facility</u>	<u>FY 98 Cost</u>	<u>FCT Facility</u>	<u>FY98 Cost</u>	<u>FAA Facility</u>	<u>FY99 Cost</u>	<u>FCT Facility</u>	<u>FY99 Cost</u>
Concord, CA	\$1,353,338	Anoka, MN	\$423,456	Concord, CA	\$1,320,939	Anoka, MN	\$427,152
Everett, WA	\$1,047,324	Carbondale, IL	\$299,784	Everett, WA	\$1,023,432	Carbondale, IL	\$305,064
Fort Pierce, FL	\$1,113,654	Chandler, AZ	\$392,550	Fort Pierce, FL	\$1,255,938	Chandler, AZ	\$431,460
Hillsboro, OR	\$1,098,362	Gateway, AZ	\$368,696	Hillsboro, OR	\$1,225,717	Gateway, AZ	\$380,064
Juneau, AK	\$1,066,483	Gwinnett, GA	\$297,108	Juneau, AK	\$1,008,362	Gwinnett, GA	\$316,008
Lafayette, IN	\$1,212,747	Hollywood, FL	\$307,872	Lafayette, IN	\$1,130,407	Hollywood, FL	\$314,376
Livermore, CA	\$1,236,710	Lakeland, FL	\$382,908	Livermore, CA	\$1,458,186	Lakeland, FL	\$384,000
Manassas, VA	\$917,365	Norman, OK	\$273,509	Manassas, VA	\$1,211,751	Norman, OK	\$273,509
Napa, CA	\$1,037,942	Pompano Beach, FL	\$267,420	Napa, CA	\$1,221,485	Pompano Beach, FL	\$284,364
Santa Rosa, CA	\$1,097,095	Ryan Field, AZ	\$350,016	Santa Rosa, CA	\$1,251,043	Ryan Field, AZ	\$377,916
Traverse City, MI	\$931,663	San Carlos, CA	\$345,228	Traverse City, MI	\$1,055,801	San Carlos, CA	\$345,228
Vero Beach, FL	<u>\$1,335,207</u>	Stewart, NY	<u>\$301,692</u>	Vero Beach, FL	<u>\$1,671,332</u>	Stewart, NY	<u>\$424,860</u>
	\$13,447,890		\$4,010,239		\$14,834,393		\$4,264,001
Average FAA VFR Tower = \$1,120,658				Average FAA VFR Tower = \$1,236,199			
Average Contract Tower = \$334,187				Average Contract Tower = \$355,333			
Average Savings = \$786,471				Average Savings = \$880,866			
Total Cost Savings for 71 Towers = \$55,839,441				Total Cost Savings for 71 Towers = \$62,541,486			

The cost comparison was conducted by averaging the annual cost of 12 high-density facilities already in the Contract Tower Program (FCT Facilities) and averaging the annual cost of 12 FAA towers with similar densities that qualified to be contracted out under FAA's draft report to Congress for both FY 1998 and FY 1999.

Activities Visited or Contacted

FAA Air Traffic Control Towers

Facility	State
Long Beach	CA
Santa Monica	CA
Torrance	CA
Van Nuys	CA
Fort Lauderdale Executive	FL
Orlando Executive	FL
Orlando Sanford	FL
Tamiami	FL
Dallas/Addison	TX
Fort Worth/Alliance	TX
Fort Worth/Meacham	TX
Seattle Boeing	WA

Federal Contract Towers (FCT)

Facility	State	Contractor
Topeka/Forbes Field	KS	Midwest
Johnson County Executive	KS	Midwest
Melbourne	FL	RVA
Naples Municipal	FL	RVA
Opa Locka	FL	RVA
Page Field	FL	RVA
Brownsville	TX	RVA
Dallas/Redbird	TX	RVA
Harlingen	TX	RVA
McAllen	TX	RVA
Fullerton	CA	Serco
Palmdale	CA	Serco
San Diego/Brown Field	CA	Serco
Renton	WA	Serco
Seattle/Tacoma Narrows	WA	Serco

FCT Contractors

Midwest Air Traffic Control Services, Olathe, KS
Robinson-VanVuren Associates, Oklahoma City, OK
Serco Management Services, Palmdale, CA

Activities Visited or Contacted (Continued)

Aviation Associations

Executive Vice President, American Association of Airport Executives,
Alexandria, VA
Representatives of National Air Traffic Controllers Association

Users

California

Commander, United States Air Force, Palmdale
Airport Manager, San Diego, Brownfield
Airport Manager, Assistant Airport Manager, and Superintendent, Van Nuys
Airport
Airport Noise Operations Technician, City of Santa Monica Airport Authority
Airport Operations Analyst, Long Beach
Representative, Boeing Corporation, Long Beach

Florida

Manager, General Aviation, Page Field General Aviation Airport
Manager, Government Affairs, Southwest Florida International Airport
Department Director, General Aviation/Facilities, Southwest Florida International
Airport
Airport Manager, Tamiami Airport
Chief of Safety, Miami Dade County
Executive Director, City of Naples Airport Authority
Assistant Airport Manager, Fort Lauderdale Executive Airport
Representatives of World Jet, Incorporated, Fort Lauderdale
Representatives of Aero Design, Fort Lauderdale
Manager, Opa Locka Airport
Executive Director, Orlando Sanford Airport Authority
Director of Operations and Maintenance, Orlando Sanford Airport Authority
Director of General Aviation, Melbourne International Airport
Airport Operations Manager, Melbourne International Airport
Chief of Police, Melbourne Airport Police Department
Chief Flight Engineer, Surveillance & Battle Management Systems, Northrop
Grumman, Melbourne
Director of Operations, Florida Institute of Technology, Melbourne
Representatives of Atlantic Jet Center, Melbourne

Kansas

President, Metro Topeka Airport Authority

Activities Visited or Contacted (Continued)

Washington

Airport Manager, Comarco Airport Services, Tacoma Narrow
Airport Manager, Renton Municipal Airport
Airport Manager, King County International Airport, Boeing Field
Senior Engineer, Boeing Corporation, Seattle

Texas

Airport Manager, City of Fort Worth Aviation Department, Meacham Airport
President, Alliance Air/Aviation Services
President, Addison Airport of Texas, Inc.
Assistant Airport Manager, Redbird Airport Management
Director and Assistant Director of Aviation, Valley International Airport
Assistant Director of Aviation, City of Brownsville Department of Aviation
Director of Aviation, City of McAllen Department of Aviation