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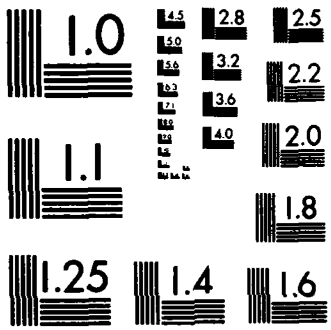

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U.S. Department of Transportation

Federal Aviation Administration

Establishment and Discontinuance Criteria for Automated Weather Observing Systems (AWOS)

Office of Aviation Policy and Plans
Washington, D.C. 20591

FAA-APO-83-6

May 1983

Ward L. Keech

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16. Abstract

This report develops establishment and discontinuance criteria for automated weather observing systems (AWOS) for publication in FAA Order 7031.2B, Airway Planning Standard Number One. Airway Planning Standard Number One contains the policy and summarizes the criteria used in determining eligibility of terminal locations for establishment, discontinuance and improvements of air navigation facilities and air traffic control services.

The criteria developed in this report are based on rigorous life-cycle cost effectiveness and benefit/cost analyses of AWOS which measure weather and environmental parameters essential to FAA operations--wind direction and speed, temperature and dew point, altimeter setting, ceiling, visibility, precipitation and thunderstorm activity.

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EXECUTIVE SUMMARY

The purpose of this report is to develop establishment and discontinuance criteria for automated weather observing systems (AWOS) for publication in FAA Order 7031.2B, Airway Planning Standard Number One. Airway Planning Standard Number One contains the policy and summarizes the criteria used in determining eligibility of terminal locations for establishment, discontinuance and improvements of air navigation facilities and air traffic control services.

Accurate and reliable advance weather information is essential to the safety and efficiency of aviation, and surface weather observations are the most important portion of it. There are over 1,400 surface weather observation stations in the U.S. operated by the National Weather Service (NWS), the Department of Defense, the FAA and various aircraft operators. Support for civil flight operations is currently limited primarily to major airports where observations are taken by the NWS, FAA-operated ATCT's and FSS's, and commercially-operated Supplementary Aviation Weather Reporting Stations.

Although the continuing growth of aviation has increased the demand for weather reports and forecasts at addition locations, the escallating costs of labor-intensive manual weather observing systems has prohibited their expansion to additional locations. Surface weather observing stations are widely separated in certain areas, affecting the accuracy and reliability of weather forecasts in those areas. Commercial instrument flight rule (IFR) operations under Parts 121 and 135 of the Federal Aviation Regulations (FAR) are restricted at over 1,200 airports with standard instrument approach procedures because of the absence of a local weather reporting service and at approximately 376 airports where the service is provided only part-time. Non-commercial IFR operations conducted under FAR Part 91 are authorized at locations without a local weather reporting service, but the minimum altitude of the approach procedures at these locations is increased in relation to the distance from the remote altimeter setting source to account for potential differences in barometric pressure. Of 1,733 airports currently with approved standard instrument approach procedures, IFR approaches by Part 91 operators at 1,307 locations are conducted with altitude information derived from a remote source. Full time remote altimeter setting penalties are required at approximately 931 airports.

These conditions suggest a need to maintain and expand accurate and reliable weather information services at sufficient locations to meet the needs of pilots, operators and air traffic control facilities. Automation of the surface weather observation function will meet this need by reducing the time devoted to weather observations at manned locations, providing a capability of taking observations at locations when facilities are closed, and expanding observation services to unmanned locations.

The establishment and discontinuance criteria developed in this report are based on a life-cycle cost effectiveness analysis for FAA towered airports and a life-cycle benefit/cost analysis for non-towered and non-federal towered airports. FAA towered airports, by virtue of the fact that they constitute control zones, are required by FAR Part 91 to have an approved weather observation service. Most equipment currently installed in manual weather observing systems is on average 20 years old and reaching the end of its economic life. Given these regulatory and operating constraints, this report summarizes a life-cycle cost analysis of various alternative systems of collecting, recording and disseminating weather data. The analysis clearly shows that AWOS is the most cost effective means of providing weather observation services at FAA towered airports.

In a rigorous life-cycle benefit/cost analysis of AWOS at non-towered and non-federal towered airports, the basic benefit areas of enhanced safety and efficiency are analyzed. Official aviation activity forecasts are used to quantify the benefits independently for each year of a system's estimated 15 year economic life and discounting the benefits for each year to their present value. These are summed to represent the present value of life-cycle benefits. Capital, operations and maintenance costs are approached on a similar present value life-cycle basis. AWOS criteria for non-towered and non-federal towered airports are developed modularly to facilitate investment decisionmaking for AWOS with any configuration of wind direction and speed, temperature/dew point, altimeter setting, ceiling, visibility, liquid and freezing precipitation, and thunderstorm sensors.

It is impossible, at least with a high degree of accuracy, to assess the impact of the criteria on agency resources as required by Order 1320.1 because (1) it is presently uncertain which specific AWOS configuration will be justified for each qualifying airport, and (2) meeting candidacy levels will not mean automatic qualification for non-towered and non-federal towered airports since benefit/cost screening is but one of several inputs to the FAA decisionmaking process relative to investment in facilities and equipment. All FAA towered airports, other than tower discontinuance candidates, where the surface weather observation function is the responsibility of the FAA (as opposed to the NWS) qualify for AWOS by virtue of cost effectiveness. There are currently 254 such locations. Priority of AWOS establishment at these locations will be given to part-time facilities, followed by full-time facilities, in recognition of the relatively greater benefits of AWOS when facilities are closed. Additionally, automated flight service stations that are obligated to take weather observations automatically qualify for AWOS. Assuming installation of systems with wind, temperature/dewpoint, altimeter setting, ceiling, visibility and liquid precipitation sensors, an additional 1,120 civil airport locations where NWS aviation weather observations are not presently available meet the establishment criteria. These include 1,035 non-towered airports, 49 FAA tower discontinuance candidate locations and 36 non-federal tower locations.

At average life-cycle unit costs of approximately $165,300 and $150,500 per system for towered and non-towered airports respectively, these installations equate to approximately $210.5 million (1981 dollars). Approximately 60 percent of the investment is incurred for facilities and equipment in the acquisition year, with the remainder representing operations and maintenance costs over an estimated 15-year economic life.

CHAPTER I - INTRODUCTION

A. Purpose

The purpose of this report is to develop establishment and discontinuance criteria for automated weather observing systems (AWOS) for publication in FAA Order 7031.2B, Airway Planning Standard Number One (Reference 1). Airway Planning Standard Number One contains the policy and summarizes the criteria used in determining eligibility of terminal locations for establishment, discontinuance and improvements of air navigation facilities and air traffic control services. AWOS is intended to cost effectively automate the weather observation function at locations where weather data is currently observed, recorded and disseminated manually and to expand weather observation services to additional locations where they are not currently available or available only part-time.

B. Background

Accurate and reliable advance weather information is essential to the safety and efficiency of aviation, and surface weather observations are the most important portion of it. Weather information is needed by pilots, operators and air traffic control facilities for planning, safety and efficiency. Information concerning hazardous weather is especially needed due to the potentially serious impact these conditions may have on aircraft performance and structural integrity.

The Department of Commerce's National Weather Service (NWS) has the statutory responsibility to provide forecasts for navigation. While the NWS provides the nucleus of the basic weather observation program, the Departments of Transportation (DOT) and Defense (DOD) furnish resources to observe and record weather data at certain locations through mutual agreements. Support for civil flight operations is currently limited primarily to major airports where observations are taken by the NWS or by FAA-operated air traffic control towers (ATCT) or flight service stations (FSS). At many smaller airports where the government does not provide surface weather observation services or where the services are provided only part-time, commercial operators establish Supplementary Aviation Weather Reporting Stations (SAWRS) under NWS oversight to satisfy FAA regulations for commercial operations. SAWRS weather observations, however, are generally taken only when needed by the operator and are not routinely available to other users. Figure 1 categorizes surface weather observation stations located in the fifty United States, Puerto Rico and the Virgin Islands, as inventoried in 1981 (Reference 2).

Although the continuing growth of aviation has increased the demand for weather reports and forecasts at additional locations, the costs of labor-intensive manual weather observing systems has prohibited their expansion to additional locations. Although most manual weather observations are taken as a part-time task, the departments collectively expend over 1,000 personyears annually to provide these observations (Reference 3). Surface weather observing stations are widely separated in certain areas, affecting the accuracy and reliability of weather

FIGURE 1

Categories of Surface Weather Observation Stations*

Operated By Or Under Oversight of NWS			
FAA Personnel			
Flight Service Stations (FSS)	216		
Air Traffic Control Towers (ATCT)	161	377	
NWS/NWS Contract Personnel			
Weather Service Forecast Offices (WSFO)	31		
Weather Service Offices (WSO)	176		
Weather Meteorological Offices (WSMO)	12		
Weather Service Contract Meterological Offices (WSCMO)	15		
Synoptic Weather Observing Stations	15		
Contract Basic Weather Observation Stations	142		
Automatic Meteorological Observing Stations	66		
Coast Guard/Marine Reporting Stations	184	641	
Supplementary Aviation Weather Reporting Stations (SAWRS)		276	1,294
DOD			148
Total Surface Weather Observation Stations			1,442

**Source:* Reference 2. Includes surface weather observation stations in the fifty United States, Puerto Rico and the Virgin Islands as inventoried in 1981. For those locations with two collocated facilities, only one facility is reflected in these counts.

forecasts in those areas. Commercial instrument flight rule (IFR) operations under Parts 121 and 135 of the Federal Aviation Regulations (FAR) are restricted at over 1,200 airports with standard instrument approach procedures because of the absence of a local weather reporting service and at approximately 376 airports where the service is provided only part-time (Reference 4). Non-commercial IFR operations conducted under FAR Part 91 are authorized at locations without a local weather reporting service, but the minimum altitude of the approach procedures at these locations is increased in relation to the distance from the remote altimeter setting source to account for potential differences in barometric pressure. Until 1976, the use of remote altimeter settings had been authorized by FAA regardless of the terrain between the runway and the remote altimeter setting source. However, a change (Reference 5) in the Terminal Instrument Procedures (TERPS) (Reference 6) prohibits the use of remote altimeter settings at airports in precipitous terrain. Based on the change, a case-by-case review of altimeter settings has resulted in the FAA disallowing IFR approaches or increasing the minima at some airports. Additionally, there have been some requests for authorization of new approach procedures which have not been approved due to the lack of a local altimeter setting. Of 1,733 airports currently with approved standard instrument approach procedures, IFR approaches by Part 91 operators at 1,307 locations are conducted with altitude information derived from a remote source (Reference 4). Full time remote altimeter setting penalties are required at approximately 931 airports (Reference 4).

These conditions suggest a need to maintain and expand accurate and reliable weather information services at sufficient locations to meet the needs of pilots, operators and air traffic control facilities. Studies and experience have shown that automated systems can meet this need in the most cost effective manner by reducing the time devoted to weather observations at manned locations, providing a capability of taking observations at locations when facilities are closed, and expanding observation services to unmanned locations.

C. Non-Federal AWOS

There will be no takeover of AWOS purchased and installed by parties other than the Federal Government. This provision is an exception to the general policy of paragraph 10 of FAA Order 7031.2B, Airway Planning Standard Number One (Reference 1), which provides eligibility for inclusion of non-federal terminal facilities in the National Airspace System with FAA assumption of ownership, operation, maintenance and logistic support.

D. Organization of Remainder of Report

For convenience and simplicity, "automated weather observing systems" will be referred to in this report simply as "AWOS."

Chapter II summarizes the criteria developed in this report for the establishment and discontinuance of AWOS. These criteria will be published in FAA Order 7031.2B, Airway Planning Standard Number One (Reference 1).

Chapter III examines the life-cycle costs of AWOS. Because AWOS may be tailored to meet site-specific needs, especially those at non-towered airports, costs (as well as benefits) are developed modularly in this report.

Chapter IV outlines the methodology used to estimate and value AWOS benefits. AWOS benefits include enhanced safety, efficiency, and other indirect but important intangible benefits. Safety benefits result from reduced risk and incidence of accidents. Efficiency benefits result from cost avoidance realized by ATCT's and commercial operators whose weather observation functions would be replaced by AWOS, and reduced risk and incidence of flight disruptions of actual and would-be instrument approaches and overflight wind checks by visual approaches. Other benefits, which are indirect or intangible in that they are difficult to quantify and ascribe site-specifically, include benefits to departing and enroute aircraft, improved quality of weather information, contribution to the weather communications network, reduced workload of flight service stations, congestion relief at major airports and accident investigation. Additionally, proximity penalties and remoteness premiums are discussed.

Chapter V derives Phase I screening criteria for AWOS at non-towered and non-federal towered airports for publication in Airway Planning Standard Number One (Reference 1). As with the investment criteria for several other agency facilities, equipment and services, the criteria for AWOS at non-towered and non-federal towered airports are two-phased. Phase I is a set of simple, generalized criteria designed to initially identify potential establishment and discontinuance candidates. Phase II is a site-specific computerized benefit/cost screening process under which life-cycle benefits are computed by using official aviation activity forecasts to quantify the present value benefits independently for each year of a system's estimated 15-year economic life.

Chapter VI provides computer-generated listings of the results of applying the Phase I and II establishment criteria for non-towered and non-federal towered airports to over 3,100 non-towered, non-federal towered and FAA tower discontinuance candidate civil airports, based on Terminal Area Forecasts over the 15-year period Fiscal Years 1981 through 1995.

Chapter VII provides a sensitivity analysis of the assumptions used in this report which are uncertain or characterized by judgment.

Chapter VIII provides a "rough" assessment of the impact of the criteria on agency resources to comply with FAA Order 1320.1. The impact is "rough" because (1) it is presently uncertain which specific AWOS configuration will be justified for each qualifying airport, and (2) meeting candidacy levels for non-towered and non-federal towered airports will not mean automatic qualification since benefit/cost screening is but one of several inputs to the FAA decisionmaking process relative to investment in facilities and equipment.

Finally, there are included a number of appendices which support analyses described in the text and a list of references used in the preparation of this report.

CHAPTER II - SUMMARY OF ESTABLISHMENT AND DISCONTINUANCE CRITERIA

This chapter summarizes the criteria for establishment and discontinuance of AWOS as developed in this report. These criteria do not apply where the National Weather Service (NWS), its agent, or the Department of Defense currently provides surface weather observation services. These newly developed criteria will be published in FAA Order 7031.2B, Airway Planning Standard Number One (APS-1) (Reference 1). APS-1 contains the policy and summarizes the criteria used in determining eligibility of terminal locations for establishment, discontinuance and improvements of air navigation facilities and air traffic control services.

A. FAA Towered Airports

All FAA towered airports where the surface weather observation function is the responsibility of the FAA qualify for AWOS establishment, except those locations identified as tower discontinuance candidates under the provisions of Paragraph 5 of APS-1. Priority of AWOS establishment at these locations will be given to part-time facilities, followed by full-time facilities, in recognition of the relatively greater benefits of AWOS when facilities are closed. Criteria for the establishment and discontinuance of AWOS at non-federal towered airports and locations identified as tower discontinuance candidates are outlined in paragraph C below.

B. Flight Service Stations

Where an automated flight service station is obligated to take weather observations, that location qualifies for AWOS establishment. Other locations with flight service stations qualify if they satisfy either the provisions of Paragraph A or C.

C. Non-Towered and Non-Federal Towered Airports

Establishment and discontinuance criteria for AWOS at non-towered and non-federal towered airports are two-phased. Phase I criteria are simple, generalized criteria designed to initially identify potential candidates. Under Phase I a ratio value is computed by summing the benefits provided to each user class and dividing the sum by the life-cycle cost. If the ratio value obtained is equal to or greater than the thresholds specified below, the airport becomes a candidate for Phase II screening. Phase II is a site-specific computerized life-cycle benefit/cost evaluation of candidates identified in Phase I using the techniques described in this report.

1. Phase I Establishment Criteria

a. Non-Towered and Non-Federal Towered Airports With Existing Standard Instrument Approach Procedures (SIAP) Or With Prospective SIAP With AWOS

Air Carrier and Air Taxi (Lesser of (ACITN+ATITN) or (3,000)) x $25.38 = $xxxx

General Aviation and Military	Per Itinerant Operation	Per Local Operation
Wind Sensor	$ 3.80	$ 2.28
Temperature/Dew Point Sensors	.04	.02
Altimeter Sensor	2.16	
Ceiling and Visibility Sensors	15.43	
Precipitation Sensor(s)	.06	.04
Thunderstorm Sensor	.01	.01

$$(GAITN+MILITN) \times \$\overline{TOTAL} = xxxx$$

$$(GALCL+MILLCL) \times \$\overline{TOTAL} = xxxx$$

Phase I Value (If 1.0 or greater, location satisfies Phase I Establishment Criteria) $\frac{Total \times AR}{LCC}$

where the terms are as defined below:

ACITN, ATITN, GAITN and MILITN are the respective numbers of annual air carrier (AC), air taxi (AT), general aviation (GA) and military (MIL) itinerant operations; and GALCL and MILLCL are the respective numbers of annual general aviation (GA) and military (MIL) local operations. Operations counts may be obtained from the "Terminal Area Forecasts" (published annually by FAA-APO), the Airport Master Record (FAA Form 5010-1), the Airport Master File (maintained by FAA's National Flight Data Center), the airport manager, or any other generally accepted source. Values for these activity variables in the Phase II criteria described below will be derived from the Terminal Area Forecast Data System.

LCC is the applicable life-cycle cost from Table A below.

AR is an adjusting proximity penalty or remoteness premium reciprocal. For candidate airports located in non-precipitions terrain and less than 10 nautical miles from a full-time, non-automated FAA/NWS/NWS Contract surface weather observation station with homogeneous weather, a proximity penalty reciprocal of .50 applies. For candidate airports that are located 90 or more nautical miles from the nearest full-time, non-automated FAA/NWS/NWS Contract surface weather observation station, a remoteness premium reciprocal of 1.25 applies. The adjustment reciprocal for all other candidate airports is 1.0.

TABLE A

Life-Cycle Cost (LCC)

LCC = Fixed Cost of $49,617 + Sum of Variable Costs Unique to Applicable Sensoring Devices* + $21,535 if System has Longline Communications

*Variable Costs Unique to Sensoring Devices:

Wind	$ 1,999
Temperature/Dew Point	1,615
Altimeter	3,974
Ceiling	41,881
Visibility	28,517
Liquid Precipitation	1,367
Freezing Precipitation	3,687
Thunderstorm	23,175

b. Other Non-Towered and Non-Federal Towered Airports

Air Carrier and Air Taxi (Lesser of (ACITN+ATITN) or (3,000)) x $25.38 = $xxxx

General Aviation and Military	Per Itinerant Operation	Per Local Operation
Wind Sensor	$ 3.80	$ 2.28
Temperature/Dew Point Sensors	.04	.02
Altimeter Sensor	.00	
Ceiling and Visibility Sensors	.00	
Precipitation Sensor(s)	.06	.04
Thunderstorm Sensor	.01	.01

$(GAITN+MILITN) \times \$\overline{TOTAL}$ = xxxx

$(GALCL+MILLCL) \times \$\overline{TOTAL}$ = xxxx

Phase I Value (If 1.0 or greater, location satisfies Phase I Establishment Criteria) $\frac{\text{Total} \times \text{AR}}{\text{LCC}}$

where the terms are as defined above in paragraph C-1-a.

2. Phase I Discontinuance Criteria

To determine whether an AWOS installation at a non-towered or non-federal towered airport meets Phase I discontinuance criteria, a ratio value is calculated by the same procedure for establishment criteria described in paragraph C-1 above. If the ratio value so obtained is less than 0.45, the system meets Phase I discontinuance criteria.

3. Phase II Criteria

Candidate airports for AWOS identified by the above criteria will be evaluated by the computerized benefit/cost subroutine developed in this report. If a benefit/cost ratio of 1.0 or greater (for establishment) or less than .45 (for discontinuance) is computed, the airport becomes a candidate. The subroutine requires the following supplemental site-specific data:

a. System acquisition and installation costs (FAA Form 2500-40, F&E Cost Estimate Summary).

b. Whether or not optional longline communications are proposed, and if required, the annual cost.

D. Sensor Configuration

The typical AWOS configuration includes sensors for wind direction and speed, temperature, dewpoint, altimeter, ceiling, visibility and liquid precipitation. However, AWOS installations may include additional or fewer sensors. For example, a cloud height (ceiling) sensor may not be justified at certain locations in close proximity to another observation site, while additional sensors, such as for freezing precipitation and thunderstorms, may be added if cost effective.

E. Non-Federal AWOS

There will be no takeover of AWOS purchased and installed by parties other than the Federal Government. This provision is an exception to the general policy of paragraph 10 of FAA Order 7031.2B, Airway Planning Standard Number One (Reference 1), which provides eligibility for inclusion of non-federal terminal facilities in the National Airspace System with FAA assumption of ownership, operation, maintenance and logistic support.

CHAPTER III - LIFE-CYCLE COSTS

A. Introduction

This chapter examines the life-cycle costs of AWOS at FAA towered airports and non-towered airports. Life-cycle costs are categorized into facilities and equipment (F&E) costs, which are assumed to occur at the beginning of the installation year, and recurring operations and maintenance (O&M) costs, which are assumed to occur at mid-year and are discounted (@ 10 percent) to their present value based on an assumed economic life of fifteen years. The cost analysis in this chapter is based in large part on the Automated Weather Observing System (AWOS) Cost Analysis (Reference 2), performed by Kentron International for the FAA AWOS Program Office. While the costs outlined in Reference 2 are in mixed year dollars, the costs in this analysis are denominated in 1981 dollars to be consistent with benefit valuations and costs in other parts of this report. Certain other modifications were made to the analysis from Reference 2 to adhere to standards of the Office of Management and Budget.

Figure 2 summarizes unit life-cycle cost estimates in 1981 dollars of complete AWOS installations at FAA towered airports operating 24 hours daily and non-towered airports. For purposes of this report, non-federal towered airports are treated as non-towered airports. The cost estimates in Figure 2 reflect quantity procurement of quality equipment presently or soon to be available on the commercial market. AWOS may be tailored to meet site-specific needs. For example, at a particular site, certain weather sensors may not be necessary, certain output media may not be desired, or the telephone answering device or longline communications may not be required. In recognition of this possibility, costs (as well as benefits) are developed modularly in this report. In this way, benefits can be matched with costs and a benefit/cost ratio can be easily computed for any given AWOS configuration. Figure 3 (for FAA towered airports) and Figure 4 (for non-towered airports), by categorizing costs by fixed costs (those which remain generally fixed regardless of the number of sensoring devices comprising the system) and variable costs (those which vary depending upon the sensor configuration), provide the means for computing the costs of a given AWOS configuration. The costs in Figures 3 and 4 flow directly from those in Figure 2, based on the methodology explained in the following paragraphs.

B. Facilities and Equipment Costs

1. Sensors. The sensor costs are carried directly from Figure 2 to Figures 3 and 4, except that the average unit module costs for wind, temperature, dew point, visibility and precipitation signal conditioning are included.

2. Tower, Guys, Anchors.

3. Signal Conditioning. When the sensors are separated from the data processing equipment by large distances, the sensor output must be amplified by a translator or signal conditioning module. In some installations, because of the proximity and compatability of the sensors with the processor, the signal conditioner may be omitted.

FIGURE 2

Estimated Unit Life-Cycle Costs of Complete AWOS Installations (1981 Dollars)

	FAA Towered Airports		Non-Towered Airports	
FACILITIES AND EQUIPMENT[1]				
SENSORS				
Wind (Direction and Speed)	$ 880		$ 880	
Ambient Temperature and Dew Point	470		470	
Dual Altimeter Setting Sensors	2,160		2,160	
Laser Ceilometer	22,770		22,770	
Visibility (Forward Scatter Meter)	15,300		15,300	
Liquid Precipitation (Quantity)	540		540	
Freezing Precipitation (Yes/No)	1,800		1,800	
Thunderstorm Detection/Location	12,600		12,600	
Tower, Guys, Anchors	+ 570	$ 57,090	+ 570	$ 57,090
SIGNAL CONDITIONING				
Enclosure, Rack, Power Supply	$ 1,210		$ 1,210	
Modules for Wind, Temperature, Dewpoint, Visibility, Precipitation	1,230		1,230	
Communications Interface Module	+ 410	2,850	+ 410	2,850
CENTRAL PROCESSOR (Including software program)		3,440		3,440
OUTPUT EQUIPMENT				
CRT Display	$ 1,310		-	
Teletype Printer	1,850		-	
Voice Generator	1,800		$ 1,800	
Telephone Answering Device	360		360	
Modem	+ 210	+ 5,530	+ 210	+ 2,370
TOTAL EQUIPMENT COST		$ 68,910		$ 65,750
INITIAL SPARES (@ 25% of "Total Equipment Cost")		17,230		16,440
OTHER F&E COSTS (@ 35% of "Total Equipment Cost")		+ 24,120		+ 23,010
TOTAL F&E COSTS (INSTALLED)		$110,260		$105,200
OPERATIONS AND MAINTENANCE				
PERSONNEL				
Observation	$ 2,162		$ 0	
Maintenance	+ 712	$ 2,874	+ 2,268	$ 2,268
SPARES INVENTORY (@ 3% of "Total Equipment Cost")		2,067		1,973
COMMUNICATIONS (with Longline)[2]		2,920		2,920[2]
FACILITIES		+ 2,404		+ 1,888
TOTAL ANNUAL O&M COSTS[3]		$ 10,625		$ 9,049
x LIFE-CYCLE DISCOUNT FACTOR[4]		x 7.976		x 7.976
TOTAL LIFE-CYCLE O&M COSTS		$ 81,874		$ 72,175
TOTAL LIFE-CYCLE COST		$192,134		$177,375

1/1982 dollars from Reference 2 discounted to 1981 dollars @ 10 percent and rounded to the nearest $10. The application of a specific price index was considered unwarranted here, given the pro forma, preliminary nature of the estimates in Reference 2. Costs are denominated in 1981 dollars to be consistent with benefit valuations and costs in other parts of this report.

2/Optional for non-towered airports. Related to distance.

3/Source: Reference 2 (modified).

4/Sum of $(1/(1+i)^{n-0.5})$ for n = 1 to 15, where 'i' is the OMB-prescribed discount rate of 10 percent and 'n' is each year of an assumed economic life of 15 years.

FIGURE 3

Estimated Unit Life-Cycle Costs of AWOS Installations at FAA TOWERED AIRPORTS (1981 Dollars)1/

	FIXED COSTS	VARIABLE COSTS UNIQUE TO SENSORING DEVICES: Wind (Direction & Speed)	Ambient Temperature & Dew Point	Dual Altimeter Setting Sensors	Laser Ceilometer	Visibility (Forward Scatter Meter)	Liquid Precip. (Qty.)	Freezing Precip. (Yes/No)	Thunderstorm Detection/ Location
FACILITIES AND EQUIPMENT									
Sensor (including modules)		$1,085	$ 880	$2,160	$22,770	$15,505	$ 745	$2,005	$12,600
Tower, Guys, Anchors	$ 570								
Other Signal Conditioning	1,620								
Central Processor and Software Program	3,440								
Output Equipment	5,530								
Initial Spares (@ 25%)	2,790	271	220	540	5,693	3,876	186	501	3,150
Other F&E (@ 35%)	+ 3,906	+ 380	+ 308	+ 756	+ 7,970	+ 5,427	+ 261	+ 702	+ 4,410
Total	$17,856	$1,736	$1,408	$3,456	$36,433	$24,808	$1,192	$3,208	$20,160
OPERATIONS AND MAINTENANCE									
Personnel									
Observation	$ 2,162								
Maintenance	712								
Spares (@ 3%)	335	$ 33	$ 26	$ 65	$ 683	$ 465	$ 22	$ 60	$ 378
Communications2/	2,920								
Facilities	+ 2,404								
Annual Total	$ 8,533	$ 33	$ 26	$ 65	$ 683	$ 465	$ 22	$ 60	$ 378
x Life-Cycle Discount Factor3/	x 7.976	x7.976	x7.976	x7.976	x 7.976	x 7.976	x7.976	x7.976	x 7.976
Total	$68,059	$ 263	$ 207	$ 518	$ 5,448	$ 3,709	$ 175	$ 479	$ 3,015
TOTAL LIFE-CYCLE COST*	$85,915	$1,999	$1,615	$3,974	$41,881	$28,517	$1,367	$3,687	$23,175

*LIFE-CYCLE COST OF A GIVEN SYSTEM = $85,915 + SUM OF VARIABLE COSTS UNIQUE TO APPLICABLE SENSORING DEVICES

1/ Source: Reference 2 (modified).

2/ Related to distance.

3/ Sum of $(1/(1+i)^{n-0.5})$ for n = 1 to 15, where 'i' is the OMB-prescribed discount rate of 10 percent and 'n' is each year of an estimated economic life of 15 years.

FIGURE 4

Estimated Unit Life-Cycle Costs of AWOS Installations at NON-TOWERED Airports (1981 Dollars)1/

	FIXED COSTS	VARIABLE COSTS UNIQUE TO SENSORING DEVICES							
		Wind (Direction & Speed)	Ambient Temperature & Dew Point	Dual Altimeter Setting Sensors	Laser Ceilometer	Visibility (Forward Scatter Meter)	Liquid Precip. (Qty.)	Freezing Precip. (Yes/No)	Thunderstorm Detection/ Location
FACILITIES AND EQUIPMENT									
Sensor (including modules)		$1,085	$ 880	$2,160	$22,770	$15,505	$ 745	$2,005	$12,600
Tower, Guys, Anchors	$ 570								
Other Signal Conditioning	1,620								
Central Processor and Software Program	3,440								
Output Equipment	2,370								
Initial Spares (@ 25%)	2,000	271	220	540	5,693	3,876	186	501	3,150
Other F&E (@ 35%)	+ 2,800	+ 380	+ 308	+ 756	+ 7,970	+ 5,427	+ 261	+ 702	+ 4,410
Total	$12,800	$1,736	$1,408	$3,456	$36,433	$24,808	$1,192	$3,208	$20,160
OPERATIONS AND MAINTENANCE									
Personnel									
Observation	$ 0								
Maintenance	2,268								
Spares (@ 3%)	240	$ 33	$ 26	$ 65	$ 683	$ 465	$ 22	$ 60	$ 378
Communications2/	220								
Facilities	+ 1,888								
Annual Total	$ 4,616	$ 33	$ 26	$ 65	$ 683	$ 465	$ 22	$ 60	$ 378
x Life-Cycle Discount Factor3/	x7.976	x7.976	x7.976	x7.976	x 7.976	x 7.976	x7.976	x7.976	x 7.976
Total	$36,817	$ 263	$ 207	$ 518	$ 5,448	$ 3,709	$ 175	$ 479	$ 3,015
TOTAL LIFE-CYCLE COST*	$49,617	$1,999	$1,615	$3,974	$41,881	$28,517	$1,367	$3,687	$23,175

*LIFE-CYCLE COST OF A GIVEN SYSTEM = $49,617 + SUM OF VARIABLE COSTS UNIQUE TO APPLICABLE SENSORING DEVICES (ADD $21,535 IF SYSTEM HAS LONGLINE COMMUNICATIONS.)

1/ Source: Reference 2 (modified).

2/ Does not include longline communications.

3/ Sum of $(1/(1+i)^{n-0.5})$ for n = 1 to 15, where 'i' is the OMB-prescribed discount rate of 10 percent and 'n' is each year of an estimated economic life of 15 years.

4. Central Processor.

5. Output Equipment. The outputs of the central data processor can be tailored. Data may be output to a digital display, to a printer, to a voice generator for voice broadcasts to airborne aircraft, to a telephone answering device (i.e., Pilot Automatic Telephone Weather Answering Service), and/or through a modem for inclusion in the National Weather Data Bank.

6. Initial Spares. When an AWOS is installed, spare parts must be available to provide for replacement or repair of malfunctioning equipment. It is assumed that adequate spares can be made available for approximately 25 percent of the "total equipment cost" (F&E costs before costs for "initial spares" and "other F&E").

7. Other F&E Costs. Other F&E costs include system design, compatibility checks, delivery, installation and testing. These costs are estimated at approximately 35 percent of "total equipment cost" (F&E costs before costs for "initial spares" and "other F&E").

C. Operations and Maintenance Costs

1. Observation Personnel.

a. FAA Towered Airports. Under existing manual weather observing systems at FAA towered airports, weather observations are taken by NWS personnel, by FAA air traffic control specialists as a secondary function, or in cases where there is a collocated flight service station, by flight service specialists. Recall, however, that the criteria developed in this report for FAA towered airports are applicable only to those locations where the FAA, as opposed to the NWS or its agent, is responsible for the weather observation function. AWOS relieves the workload of the personnel performing these functions by automatically observing, recording and transmitting weather information. At this writing, state-of-the-art AWOS is not capable of measuring all weather phenomena. For example, smoke, haze, dust and fog cannot be identified by commercially available sensors. Such weather data, however, can be manually entered into AWOS as specific remarks when it becomes necessary to augment the automatic observations. Since the need for these manually entered remarks is rare, it is estimated that there will be a reduction of 95 percent in the time devoted to the weather observation function once an AWOS is installed. The NWS has found that about 25 percent of one person's time on duty is required to manually observe, record and transmit the weather (per Reference 2). This factor is the average amount of time required for these functions, taking into account routinely hourly observations during periods of good weather and greater amounts of time monitoring conditions during marginal, changing and hazardous weather. This factor was checked by Reference 2 during visits to FAA facilities and appears valid. Given these assumptions then, only 1.25 percent of the observer's time (or 18 minutes a day) is necessary to augment AWOS ((.25 x (1-.95)) = .0125; .0125 x 24 hrs./day x 60 mins./hr. = 18 minutes). For an AWOS-equipped towered airport operating 24 hours daily, Figure 5 derives an estimated annual cost of weather observation personnel of $2,162.

b. Non-towered Airports. Since there are no weather observation personnel at non-towered airports, other than those with a flight service station, there are no costs that accrue in this category. The pilot is totally dependent upon the output of the automated system.

2. Maintenance Personnel. This analysis assumes that AWOS equipment will be maintained by government-employed maintenance specialists.

a. FAA Towered Airports. At FAA towered airports, maintenance technicians are assumed to be on site. It is assumed that 4 days annually are required for preventive maintenance and an additional 4 days annually for unprogrammed maintenance. Assuming a GS-11/5 annual salary of $25,486 over 9 months and $26,710 over 3 months equates to a weighted 1981 salary of $25,792. This salary must be adjusted by a fringe benefits overhead factor of 1.26 (per Reference 7). The annual cost of maintenance personnel for AWOS can then be calculated as:

(8/365) x $25,792 x 1.26 = $712

b. Non-towered Airports. The above analysis for FAA towered airports is also applicable to non-towered airports, except that an allowance must be made for travel to and from remote locations. Allowing 4 persondays per year to accomodate travel time and assuming transportation and related travel costs amount to $150 for each day of travel, the annual maintenance personnel costs for AWOS at a non-towered airport can be calculated as:

((12/365) x $25,792 x 1.26) + (8 x $150) = $2,268

3. Spares. The costs of recurring annual spares inventories parallels that for initial spares discussed above in paragraph B-6. The estimated average annual cost to repair equipment sent to a depot or manufacturer for reconditioning is assumed to be 1 percent of "total equipment cost" (F&E costs before costs for "initial spares" and "other F&E"). Replacement of those items that are not repairable is estimated at 2 percent of the "total equipment cost."

4. Communications. At FAA towered airports, local weather observations are normally transmitted to the Weather Message Switching Center. Weather observations at non-towered airports may or may not be of such value that they must be transmitted to and collected by the central weather data network. When this information is not essential, no longline is necessary. However, when local observations are of value to the central

FIGURE 5

Estimated Annual Cost of Weather Observation Personnel at an FAA Towered Airport Operating 24 Hours Daily (1981 Dollars)[1]

(A) Annual Hours of Operation (365 x 24)			8,760
(B) Productive Hours Per Observer			
Annual Hours Available (52 x 40)		2,080	
Less: Vacations	120		
Sick Leave	40		
Holidays	88		
Training	+ 20	- 268	1,812
(C) Net Annual Personyears (A/B)			4.83
(D) Annual Supervisory Personyears			+ .61
(E) Total Annual Personyears (C + D)			5.44
(F) Fraction of Observer's Time Required to Augment AWOS			x.0125
(G) Personyears Required Annually to Augment AWOS (E x F)			.0680
(H) Average Annual Salary after Fringe Benefits[2]			x31,795
(I) Annual Observation Personnel Costs (G x H)			$ 2,162

1/Source: Reference 2 (modified).

2/The median 1981 salary of surface weather observation personnel, including NWS personnel, FAA controllers and FAA flight service specialists, was $25,234. Applying a fringe benefits overhead factor of 26 percent (per Reference 7) results in an average annual salary after fringe benefits of $31,795.

FIGURE 6

Estimated Annual AWOS Communication Costs (1981 Dollars)

	FAA Towered Airports	Non-Towered Airports With Longline	Non-Towered Airports Without Longline
Longline*	$2,700	$2,700	$ 0
Telephone	+ 220	+ 220	+ 220
	$2,920	$2,920	$ 220

*Related to distance.

weather data network, the longline is desirable. Average annual communication costs associated with AWOS are summarized in Figure 6. On a site-specific basis, longline communications costs may vary since they vary with distance.

5. Facilities.

a. FAA Towered Airports. Facility costs of AWOS include the fair market value of the realty and the costs of utilities associated with the weather observation function. Most weather sensors are mounted outdoors, while their displays and associated electronics are housed indoors. Utility costs include those for the building and power requirements for operation of the sensors, display and associated electronics. At FAA towered airports, where the FAA is responsible for the weather observation function, it is assumed that an area 8 feet by 10 feet (80 square feet) is required to acccomodate the equipment. An additional area of 10 feet by 15 feet (150 square feet) is necessary for the observer, but since only 1.25 percent of the observer's time is devoted to augmenting AWOS (as explained above), only 1.25 percent of this area (or about 2 square feet) is chargeable to the weather observation function. At an average fair rental value of $20 per square foot, the annual cost of floor space is $1,640 (82 square feet x $20). Assuming utility costs of $2 per square foot for the building and $50 per month for operation of the sensors, display and associated electronics, the annual cost of utilities is $764 (82 square feet x $2) + ($50 per month x 12 months)). Adding these charges together, annual facility costs for AWOS at an FAA towered airport total $2,404.

b. Non-towered Airports. At non-towered airports, total space requirements are assumed to be only 8 feet x 8 feet (64 square feet), because the CRT display and teletype printer are not installed and there is no space requirement for an observer. Assuming utility costs for operation of the sensors, display and associated electronics of $40 per month and keeping other assumptions as for FAA towered airports, the annual facility costs for AWOS at a non-towered airport total $1,888 ((64 square feet x $20) + (64 square feet x $2) + ($40 per month x 12 months)).

D. Determining the Life-Cycle Cost of a Given System

Since the costs in the chapter are derived modularly, life-cycle costs can be easily estimated for various AWOS configurations. The life-cycle cost of a given AWOS installation can be determined from Figure 3 (for an FAA towered airport) and Figure 4 (for a non-towered airport) by summing the life-cycle fixed costs and the life-cycle variable costs unique to the applicable sensoring devices.

For example, an AWOS installation at an FAA towered airport having all the sensors outlined in Figure 3 has a life-cycle cost in 1981 dollars of approximately $192,000, computed as follows:

Fixed Costs		$ 85,915
Variable Costs:		
Wind	$ 1,999	
Temperature/Dew Point	1,615	
Altimeter	3,974	
Ceiling	41,881	
Visibility	28,517	
Liquid Precipitation	1,367	
Freezing Precipitation	3,687	
Thunderstorm	+23,175	+106,215
		$192,130

An AWOS installation at a non-towered airport having all the sensors outlined in Figure 4 has life-cycle costs in 1981 dollars of approximately $177,000 with and $156,000 without longline communications, computed as follows:

Fixed Costs		$ 49,617
Variable Costs:		
Wind	$ 1,999	
Temperature/Dew Point	1,615	
Altimeter	3,974	
Ceiling	41,881	
Visibility	28,517	
Liquid Precipitation	1,367	
Freezing Precipitation	3,687	
Thunderstorm	+23,175	+106,215
		$155,832
Longline communications, if applicable		+ 21,535
		$177,367

At the date of this report, the typical AWOS configuration is initially projected by the FAA AWOS Program Office to include sensors for wind direction and speed, temperature, dew point, altimeter, ceiling, visibility and liquid precipitation. However, future configurations may include additional or fewer sensors. For example, a cloud height (ceiling) sensor may not be justified at certain locations in close proximity to another observation site, while additional sensors, such as for freezing precipitation and thunerstorms, may be added if cost effective. The life-cycle costs in 1981 dollars of the basic configuration are outlined below for FAA towered and non-towered airports:

		FAA Towered Airports	Non-Towered Airports
Fixed Costs (Includes longline communications for FAA towered airports)		$ 85,915	$ 49,617
Variable Costs:			
Wind	$ 1,999		
Temperature/Dew Point	1,615		
Altimeter	3,974		
Ceiling	41,881		
Visibility	28,517		
Liquid Precipitation	+ 1,367	+ 79,353	+ 79,353
			$128,970
Longline communications, if applicable			+ 21,535
		$165,268	$150,505

CHAPTER IV - ESTIMATION AND VALUATION OF AWOS BENEFITS

A. Introduction

The establishment and discontinuance criteria for AWOS at FAA towered airports are derived in this report through a cost-effectiveness analysis, while those for non-towered and non-federal towered airports are based on a conventional benefit/cost analysis. This chapter examines, in quantitative and qualitative terms, the benefit sides of these analyses. Cost-effectiveness analysis, or more specifically least-cost analysis, concentrates on identifying the least expensive way of producing a given amount of a certain output, or as applied in this report, the most cost effective means of the continued provision of weather observation services at FAA towered airports where the FAA, as opposed to the NWS or its agent, is responsible for the weather observation function. Benefit/cost analysis, as applied in this report, is a quantitative evaluation in which the life-cycle capital, operating and maintenance costs of AWOS are compared with the dollar value of the life-cycle benefits that are expected. Intuitively, benefit/cost ratios of one or more are good investments, while those of less than one are poor investments.

Part 91 of the Federal Aviation Regulations (FAR) requires that all control zones have weather observation services. Since FAA towered airports constitute control zones, weather observations are required at FAA towered airports. Most equipment presently installed in manual weather observing systems is over 20 years old and is approaching or past the end of its economic life (Reference 2). Given these regulatory and operating constraints, Section B of this chapter summarizes a life-cycle cost-effectiveness analysis of various alternative systems of observing, recording and disseminating weather data at FAA towered airports. The analysis clearly shows that AWOS is the most cost effective means of providing weather observation services at FAA towered airports.

Unlike FAA towered airports, weather observation services are not necessarily required at non-towered and non-federal towered airports. Although the continuing growth of aviation has increased the need of and demand for weather observations at additional locations, the costs of labor-intensive weather observing systems has prohibited their expansion. At many airports where the government does not provide weather observation services, commercial operators have established self-operated Supplementary Aviation Weather Reporting Stations (SAWRS) to satisfy FAR Parts 121 and 135 which require weather observations for commercial instrument flight operations. The quantifiable benefits ascribable to the establishment and operation of AWOS at non-towered and non-federal towered airports include safety and efficiency. Safety benefits, addressed in Section C-2 of this chapter, result from reduced incidence of accidents for which unfavorable winds, density altitude, low ceiling/visibility, precipitation or thunderstorms are causes and/or factors. Efficiency benefits, addressed in Section C-3, result from cost avoidance realized by SAWRS operators whose weather observation functions would be replaced by AWOS, reduced incidence of diversions and cancellations of actual and would-be instrument approaches and overflights by visual approaches. Section C-4 outlines proximity penalty and remoteness premium provisions which compensate for close proximity to or remoteness from a full time, non-automated FAA/NWS/NWS Contract surface weather observation station.

Section D addresses other benefits of AWOS which are termed indirect or intangible because they are difficult to quantify and ascribe site-specifically. These include benefits to departing and enroute aircraft, improved quality of weather information, contribution to the weather communications network, reduced workload of flight service stations, congestion relief at major airports and accident investigation.

AWOS installations may be tailored to meet site-specific needs. Differing requirements for various non-towered and non-federal towered airports may result in establishment of different AWOS configurations. In recognition of this possibility, benefits (as well as costs) for non-towered and non-federal towered airports are developed modularly in this report to facilitate computation of the benefit/cost ratio of the tailored system proposed for the airport in question.

B. FAA Towered Airports

1. Introduction

As mentioned above, FAR Part 91 requires weather observations at FAA towered airports. Most equipment presently installed in manual weather observing systems is over 20 years old and approaching the end of or past its economic life (Reference 2). Some equipment is no longer in production and spare parts are sometimes difficult to find for others. Modern instrumentation provides easier reading with greater accuracy and less maintenance through digital displays as compared to dial instruments currently in general use. Given the state of existing weather observing systems and the regulatory requirement for weather observing services, Section B-2 justifies the regulatory requirement for weather observing systems at FAA towered airports in cost versus benefit terms and then identifies the most cost-effective system through a least-cost analysis of various alternative systems of collecting and disseminating weather data at manned weather observation stations. These alternatives range from replacing current manual weather observing systems with new manual systems to replacing them with AWOS:

a. Manual Weather Observing Systems

(1) FAA or National Weather Service (NWS) Observers

(2) Contract Observers. Under this option, NWS contracts with private companies or individuals, under NWS oversight, to obtain basic aviation-oriented weather observations (Contract Basic) or complete aviation weather observations (Weather Service Contract Meteorlogical Observatory or WSCMO).

(3) Supplementary Aviation Weather Reporting Stations (SAWRS). At many locations where the government does not provide aviation weather observations or where the service is provided only part-time, commercial

operators establish these stations under NWS oversight to satisfy FAA regulations for commercial instrument operations. Equipment and personnel costs are borne by the commercial operator.

b. Automated Weather Observing Systems (AWOS)

Costs are analyzed in Section B-3 for each of the above manual weather observing systems. In Section B-4, the results of the analysis in Section B-3 and the AWOS costs developed earlier in Chapter III are combined and converted to their life-cycle cost equivalents. It will be shown that AWOS is the most cost effective means of providing weather observing services FAA at towered airports.

2. Justification of Weather Observation Services at FAA Towered Airports

As mentioned above, FAA towered airports are required to have weather observation services by virtue of FAR Part 91 which requires weather observations in control zones. Although there are several benefits to these requirements, they are essentially based on safety considerations. Later, in Section C of this chapter, safety benefits are derived for weather observations at non-towered and non-federal towered airports by comparing historic weather-related accident rates with weather observations and weather-related accident rates without weather observations available. This approach to quantifying safety benefits cannot be directly used for FAA towered airports, however, because FAA towered airports have historically had weather observation services. However, by making certain adjustments to the analysis for non-towered and non-federal towered airports, a baseline justification can be derived for the provision of weather observing systems at FAA towered airports.

Figure 7 derives safety benefits of weather observations per activity unit at FAA towered airports for each user class by weather phenomena by analogy with the analysis derived later in Section C of this chapter for non-towered and non-federal towered airports. To account for the impact of more landing aids and other factors which would bear on a comparison of weather-related accident rates with and without weather observations at FAA towered airports, all avertable accident rates are reduced by one third. Avertable wind-related accident rates are reduced an additional third for the air taxi user class and two thirds for the air carrier user class in consideration of their greater aircraft weight and lesser proneness to such accidents as compared to the general aviation user class. Figure 8 applies the results from Figure 7 to 1981 air traffic activity at FAA-operated ATCT's.

The foregoing assumptions were factored into this analysis to account for the historical accident rate differences at airports having many as opposed to few or no landing aids. While these assumptions should not be considered gospel, they do adequately describe the relative differences in accident potential between these airport types. Thus, the requirement for weather observation services can be justified at FAA towered airports on the basis of safety alone. Of course there are benefits other than safety ones, but the purpose here is simply to ascertain whether or not mandatory weather observation services at FAA towered airports are economically justified. Having established that they are, the analysis now becomes one of cost effectiveness.

FIGURE 7

Extrapolated Safety Benefits of Weather Observations Per Operation at FAA Towered Airports (1981$)

Weather Phenomenon and User Class	Cost Per Accident ($000): Fatalities and Injuries[1]	Cost Per Accident ($000): Aircraft Damage[2]	Cost Per Accident ($000): Total	Adjusted Avertable Accident Rate[3] x 10^{-6} Per: Itin. Opn.	Adjusted Avertable Accident Rate[3] x 10^{-6} Per: Local Opn.	Benefit Per: AC Itin Opn	Benefit Per: AT Itin Opn	Benefit Per: GA Itin Opn	Benefit Per: GA Local Opn	Benefit Per: ML Itin Opn	Benefit Per: ML Itin Opn
Wind											
AC	$ 892	$2,733	$ 3,625	.823	-	$ 2.983					
AT	116	60	176	1.646	-		$ .290				
GA	45	24	69	2.469	1.481			$.170	$ .102		
ML	70	608	678	2.469	1.481					$1.674	$1.004
Density Altitude											
AC	207	2,400	2,607	.067	-	.175					
AT	27	52	79	.067	-		.005				
GA	10	21	31	.067	.040			.002	.001		
ML	16	530	546	.067	.040					.037	.022
Ceiling/Visibility											
AC	13,958	5,549	19,507	.925	-	18.044					
AT	1,809	122	1,931	.925	-		1.786				
GA	697	50	747	.925	-			.691	-		
ML	1,085	1,247	2,332	.925	-					2.157	-
Precipitation											
AC	295	3,330	3,625	.075	-	.272					
AT	38	73	111	.075	-		.008				
GA	15	30	45	.075	.045			.003	.002		
ML	23	744	767	.075	.045					.057	.035
Thunderstorms											
AC	121	2,400	2,521	.019		.048					
AT	16	52	68	.019			.001				
GA	6	21	27	.019	.011			.001	.000		
ML	9	530	539	.019	.011					.010	.006
						$21.522	$2.090	$.867	$0.105	$3.935	$1.067

1/ Probabilities of fatalities, serious injuries and minor injuries per accident (by analogy with non-towered airport analysis in Appendix A) applied to average occupant load factors by user class (per Reference 8) and unit losses in 1981 dollars of $580,000 per statistical life, $42,000 per statistical serious injury and $16,000 per statistical minor injury (per Appendix B and Reference 9).

2/ Probabilities of aircraft being destroyed, substantially damaged and minorly damaged per accident (by analogy with non-towered airport analysis in Appendix A) applied to unit losses in 1981 dollars of $7,100,000, $157,000, $64,000 and $1,600,000 per destroyed aircraft, $2,400,000, $52,000, $21,000 and $530,000 per substantially damaged aircraft, and $1,200,000, $26,000, $11,000 and $265,000 per minorly damaged aircraft, for the respective user classes (per Reference 9).

3/ Drawn by analogy with analysis for non-towered and non-federal towered airports in Section C of this chapter, except that all avertable accident rates are reduced by one third to allow for the impact of landing aids and other factors at FAA towered airports which would bear on a comparison of weather-related accident rates at FAA towered airports with and without weather observations. Additionally, avertable wind-related accident rates are reduced by one third for the air taxi user class and two thirds for the air carrier user class in consideration of their greater weight and lesser proneness to such accidents.

FIGURE 8

Results of Figure 7 Applied to FY 1981 Air Traffic Activity at Airports With FAA-Operated ATCT's (1981 Dollars)1/

	AC	AT	GA	ML	TOTAL	Annualized Cost4/	B/C Ratio
Mean, 431 ATCT's2/	$ 473,782	$ 23,646	$57,590	$14,604	$ 569,622	$65,653	8.7
Median2/, SBN	434,766	24,593	33,300	5,169	497,828	62,077	8.0
5 Busiest ATCT's2/							
ORD	11,082,409	221,406	45,672	15,567	11,365,054	76,386	148.8
ATL	11,604,124	65,996	33,388	13,561	11,717,069	76,386	153.4
LAX	8,369,884	100,855	57,975	11,577	8,540,291	76,386	111.8
DEN	6,781,302	126,533	84,802	7,142	6,999,779	76,386	91.6
DFW	7,400,964	196,475	24,498	3,050	7,624,987	76,386	99.8
5 Least Busy ATCT's2/ excluding ATCT discontinuance candidates3/							
FMH	0	0	2,225	78,220	80,445	62,077	1.3
KWA	10,976	2,255	1,934	67,794	82,959	62,077	1.3
GFK	131,177	1,678	34,865	1,021	168,741	76,386	2.2
JLN	98,528	125	15,881	884	115,418	62,077	1.9
ADQ	196,152	138	11,305	30,379	237,974	62,077	3.8

1/ Source: Reference 10; 1981 edition dated September 30, 1981.

2/ In terms of 1981 itinerant aircraft operations.

3/ As tentatively identified in Reference 11 as potential FAA ATCT discontinuance candidates.

4/ Derived from Figure 16 using weighted costs of manual weather observing systems with FAA, NWS, or WSCMO observation personnel: ($59,350 x .13147) + (Total Annual O&M Costs - Observation Personnel Costs) + ((Daily Operating Hours/24) x Observation Personnel Costs). .13147 is the capital recovery factor of a uniform series over 15 periods with present value of $1 at 10 percent.

3. Costs of Manual Weather Observing Systems

a. Introduction

As mentioned above, this analysis assumes that since most equipment presently installed in manual weather observing systems is over 20 years old and approaching the end of or past its economic life, new equipment must be scheduled to replace the old. The cost analysis in this section is tailored in large part after the Automated Weather Observing System (AWOS) Cost Analysis (Reference 2), performed by Kentron International for the FAA AWOS Program Office. While the costs outlined in Reference 2 are in mixed year dollars, the costs in the following analysis are denominated in 1981 dollars to be consistent with benefit valuations and costs in other parts of this report. Certain other modifications were made to the analysis from Reference 2 to adhere to standards of the Office of Management and Budget. Costs are categorized into those for replacement observation equipment, observation personnel, maintenance personnel, spaces inventory, communications equipment and facilities.

b. Replacement Observation Equipment

Figure 9 outlines estimated observation equipment replacement costs at manned weather observing stations as they are currently structured. The equipment replacement costs outlined in Figure 9 are based on catalog or vendor estimated "off-the-shelf" prices. When appropriate, quantity discounts are taken into account. Installation costs are conservatively estimated in that they are based only on the removal of the old equipment and acquisition of and replacement with the new. Existing cables, wires, supporting structure, etc. are assumed not to require replacement. It is also assumed that transportation charges can be absorbed within the estimates made. Note that NWS-approved equipment at SAWRS facilities, as they currently exist, is far less sophisticated than that installed at FAA and NWS sites. Through austere, this equipment provides the SAWRS operator with an approved capability for obtaining necessary weather observation coverage for his operations. Equipment and personnel costs are borne by the SAWRS operator.

c. Weather Observation Personnel

Figure 10 outlines calculations of the estimated annual costs of observation personnel for manual weather observing stations operating 8, 16 and 24 hours per day.

As discussed earlier in Chapter II, the NWS has found that, on average, about 25 percent of one person's time on duty is required to manually observe, record and transmit the weather at airport locations with FAA or NWS observation personnel. This factor is the average amount of time required for these functions, taking into account routinely hourly observations taken during periods of good weather and greater amounts of time monitoring conditions during periods of marginal, changing and hazardous weather. This factor was checked by Reference 2 during visits to FAA facilities and appears valid.

FIGURE 9

Estimated Weather Observation Equipment Replacement Costs (1981 Dollars)[1]

FAA, NWS and WSCMO Stations (except SAWRS-only stations)

Wind Direction and Speed	$ 1,090
Ambient Temperature and Dew Point	610
Dual Altimeter Setting Indicators	2,300
Laser Ceilometer	22,950
Visibility	15,750
Liquid Precipitation Quantity	540
Signal Conditioning Equipment[2]	2,430
Display Terminal	+ 1,810
	$47,480

Contract Basic Stations

Wind Direction and Speed	$ 1,090
Ambient Temperature and Dew Point	610
Station Pressure	840
Liquid Precipitation Quantity	540
Signal Conditioning Equipment[2]	2,430
Display Terminal	+ 1,220
	$ 6,730

SAWRS-Only Stations

Wind Direction and Speed	$ 810
Ambient Temperature and Dew Point	50
Altimeter Setting Indicator	230
Sight Clinometer and Ceiling Light	+ 810
	$ 1,900

1/1982 dollars from Reference 2 discounted to 1981 dollars @ 10 percent and rounded to the nearest $10. The application of a specific price index was considered unwarranted here, given the pro forma, preliminary nature of the cost estimates in Reference 2.

2/Required for new types of sensors.

FIGURE 10

Estimated Annual Costs of Observation Personnel for Manual Weather Observing Systems (1981 Dollars)1/

24 Hour Per Day Facility	FAA ATCT	FAA FSS	NWS Observer	NWS WSCMO	NWS Contract Basic	SAWRS
(A) Annual Hrs. of Opn. (365 x 24)	8,760	8,760	8,760	-	-	8,760
(B) Productive Hrs. Per Observer						
Annual Hrs. Available (52 x 40)	2,080	2,080	2,080	-	-	2,080
Less: Vacations, Sick Leave, Holidays and Training	- 268	- 268	- 268	-	-	- 228
Net Productive Hours	1,812	1,812	1,812	-	-	1,852
(C) Net Annual Personyears (A/B)	4.83	4.83	4.83	-	-	4.73
(D) Annual Supervisory Personyears2/	+ .61	+ .61	+.61	-	-	+ .32
(E) Total Annual Personyears (C + D)	5.44	5.44	5.44	-	-	5.05
(F) Fraction of Time Devoted to WX Observation Function	x .25	x .25	x .25	-	-	x .25
(G) Productive Personyears for Weather Observation Function (E x F)	1.36	1.36	1.36	-	-	1.26
(H) Average Annual Salary after Fringe Benefits	$38,948 3/	$29,577 4/	$26,859 5/			$16,800
(I) Annual Personnel Costs (G x H)	$52,969	$40,225	$36,528	$84,300	$17,520	$21,168
16 Hour Per Day Facility	$35,313	$26,817	$24,352	$56,200	$11,680	$14,112
8 Hour Per Day Facility	$17,656	$13,408	$12,176	$28,100	$ 5,840	$ 7,056

1/Source: Reference 2 (modified). While Reference 2 used a 30 percent fringe benefits overhead factor for government observers, this analysis (as indicated below) uses a 26 percent factor to be consistent with OMB guidelines (Reference 7).

2/Ratio of supervisors to employees assumed to be approximately 1:8 for FAA and NWS and 1:15 for SAWRS.

3/Weighted GS-12/5 1981 salary of $30,911 x 1.26 fringe benefits overhead factor (per Reference 7) = $38,948

4/Weighted GS-10/5 1981 salary of $23,474 x 1.26 fringe benefits overhead factor (per Reference 7) = $29,577

5/Weighted GS-9/5 1981 salary of $21,317 x 1.26 fringe benefits overhead factor (per Reference 7) = $26,859

6/$2.00 per hourly observation x 24 hours per day x 365 days per year = $17,520.

Under WSCMO contracts, under which complete aviation weather observations are provided, payment is based on the manpower necessary to fulfill the contractual requirements. The average cost of WSCMO contracts was $88,500 in FY 1982 per Reference 2. Contract Basic agreements provide payment for each hourly weather observation taken. Special observations are not normally taken. The NWS has calculated the average cost of such contracts to be $1.90 per observation (1980 dollars) per Reference 2. As mentioned earlier, the mixed dollar values in Reference 2 have been converted to and denominated in 1981 dollars in this section to be consistent with benefit valuations and costs in other parts of this report. At a conservative annual rate of increase in personnel costs of 5 percent, the costs cited above for WSCMO and Contract Basic agreements can be restated in 1981 dollars as approximately $84,300 per year and $2.00 per observation, respectively.

The primary job responsibility of SAWRS personnel usually is that of company dispatcher and ground handling of aircraft, passengers and crew. Consequently, the weather observation function is a secondary, although necessary, function. It is assumed that 25 percent of the salaries of SAWRS personnel is attributable to the weather observation function. SAWRS personnel costs are borne by the operator, while training of personnel is provided by the NWS.

d. Maintenance Personnel

Three levels of maintenance are performed at the observing site: preventive maintenance, repair on-site, and remove/replace/send away for depot or manufacturer repair. Preventive maintenance, which is performed on a periodic schedule, includes operations functional checks, calibration, lens cleaning, etc. On-site repairs include those actions within the capabilities of the local maintenance. Problems which cannot be solved by the local maintenance facility are resolved by replacement and shipping the defective equipment to a depot or manufacturer.

Figures 11 and 12 summarize the annualized cost of maintenance personnel (in 1981 dollars) for manual weather observing systems. Maintenance personnel at weather observing stations are responsible for other, non-weather related equipment also. As an estimate of the maintenance manpower required to maintain existing government manual weather observing systems, this analysis rests on the NWS standard that, on average, approximately 36 percent of technicians' time is devoted to weather equipment (Reference 12 as cited by Reference 2). The NWS standard does not differentiate between a one, two or three shift operation. Maintenance personnel costs under WSCMO contracts are assumed to be the same as NWS locations. Because of the equipment simplicity typical of Contract Basic stations, maintenance manpower costs at these sites are assumed to be half of those at NWS stations. Maintenance of weather equipment installed at SAWRS locations is generally accomplished by the operator or by a maintenance technician under contract.

e. Spares Inventory

Spares inventory costs include those of the local spares inventory, spares inventory at higher echelons in the supply system, the maintenance costs at the depot or manufacturer to restore malfunctioning equipment to operational status, and the cost of replacing irrepairable equipment.

FIGURE 11

Personyears Devoted Annually to Maintain FAA/NWS/WSCMO Manual Weather Observing Systems[1/]

	FAA/NWS/WSCMO
(A) Annual Work Hours (365 x 8)	2,920
(B) Productive Hrs. per Technician Annual Hrs. Available (52 x 40)	2,080
Less: Vacations, Sick Leave, Holidays and Training	- 268
Net Productive Hours	1,812
(C) Net Annual Personyears (A/B)	1.61
(D) Annual Supervisory Personyears[2/]	+ .20
(E) Total Annual Personyears (C + D)	1.81
(F) Fraction of Time Devoted to Weather Observation Equipment[3/]	x .36
(G) Personyears Devoted Annually to Weather Observation Equipment (E x F)	.65

1/Source: Reference 2 (modified).
2/Assumes ratio of supervisors to employees of approximately 1:8.
3/See text.

FIGURE 12

Annual Costs of Maintenance Personnel for Manual Weather Observing Systems (1981 Dollars)[1/]

	FAA/NWS/WSCMO	Contract Basic	SAWRS
Personyears Devoted Annually to Weather Observation Equipment	.65[2/]		
Average Annual Salary after Fringe Benefits	x32,498[3/]		
Annual Maintenance Personnel Costs	$21,124	$10,562	$300

1/ Source: Reference 2 (modified).
2/ From Figure 11.
3/ Weighted 1981 salary of $25,792 x 1.26 fringe benefits overhead factor = $32,498.

Keeping with the assumption that most present manual weather observing systems are approaching the end of or past their economic lives and must be replaced, the costs of existing spares inventories for these systems are sunk. The cost of establishing an initial spares pool for new manual observing systems is estimated at 25 percent of the cost of the new replacement equipment. As time passes, this pool must be replenished as spares are used to return equipment to operating status. It is estimated that the average annual cost to repair equipment that is annually returned to a depot or manufacturer for reconditioning is 4 percent of the total equipment replacement cost. Further, the average annual cost of equipment that must be procured as replacement for equipment that is no longer repairable is estimated at 8 percent of the total equipment replacement cost. Based on these assumptions, Figure 13 summarizes the estimated costs of establishing the initial spares pool and annual repair and replacement costs.

FIGURE 13

Estimated Spares Inventory Costs for Manual Weather Observing Systems (1981 Dollars)*

	FAA, NWS and WSCMO Stations (Except SAWRS-Only)	Contract Basic	SAWRS-Only Sites
Initial Spares Costs (@ 25%)	$11,870	$1,683	$ 475
Annual Spares Replenishment Costs			
Repair Cost (@ 4%)	$ 1,899	$ 269	$ 76
Replacement Cost (@ 8%)	+ 3,798	+ 538	+ 152
Total	$ 5,697	$ 807	$ 228

*Source: Reference 2 (modified).

f. Communications

At FAA towered airports, surface weather data is observed, recorded, communicated to local users, and inputed to the central weather data network for dissemination to other users. Annual communications costs allocable to the weather observation function are shown by station type in Figure 14. At FAA ATCT's and SAWRS locations, weather data is relayed by telephone or electrowriter to the designated FSS for input into the weather data network. Because the communications costs for the weather observing function are small for these facilities, a conservative approach is taken in this analysis of not charging or allocating any communication costs to the weather observation function at these facilities. The standard installation at the majority of FSS's is the Western Union leased Service A which includes maintenance of equipment and circuits. Because communications include not only distributing local weather observations but also receiving weather briefing information (observations, forecasts and NOTAMS) from other stations, only 10 percent of the annual communication costs of FSS's is charged to the weather observation function in this analysis. At NWS locations, those with NWS observers or NWS contract observers, communications circuits are commercially leased. Since the NWS longline is used exclusively to transmit weather observations from these stations, 100 percent of the annual cost can be charged to the weather observation function.

FIGURE 14

Estimated Annual Communications Costs Allocable to Manual Weather Observing Systems (1981 Dollars)1/

	ATCT	FSS	NWS Observer/NWS Contract Observer	SAWRS
Longline2/		$270	$2,700	
Telephone/Processor/ Electrowriter		+216	216	
Maintenance			1,260	
Spares			+ 90	
Total	$ 0	$486	$4,266	$ 0

1/ 1982 dollars from Reference 2 discounted to 1981 dollars @ 10 percent. The application of a specific price index was considered unwarranted here, given the pro forma, preliminary nature of the estimates in Reference 2.

2/ Related distance.

g. Facilities

The discussion of facility costs for manual weather observing systems parallels closely with those discussed in Chapter 3 for AWOS. Facility costs include the fair market value of the realty and the costs of utilities associated with the weather observation function. While most weather sensors are mounted outdoors, their associated electronics and displays are housed indoors. Utility costs include those for the building and power requirements for operation of the sensors, display and associated electronics.

At stations with FAA, NWS or NWS contract observers (except Contract Basic stations), it is assumed that an area of 8 feet by 10 feet (80 square feet) is required to accommodate the equipment. An additional area of 10 feet by 15 feet (150 square feet) is necessary for the observer, but since only 25 percent of the observer's time is devoted to the weather observation function, only 25 percent, or approximately 37 square feet, of this floor area is chargeable to the weather observation function. The total area required is then 117 square feet. A fair market value of $20 per square foot is assumed. Annual utility costs for the building are estimated at $2 per square foot and those for operation of the sensors, display and associated electronics are estimated at $30 per month. At SAWRS and Contract Basic stations, which typically have less equipment, space requirements are assumed to be 8 feet by 6 feet (48 square feet) for the equipment and 25 percent of an area 8 feet by 10 feet (or 20 square feet) for the observer, or a total of 68 square feet. The fair market rental value and annual utility costs for these facilities per square foot is assumed to be the same as those sites above with FAA, NWS or NWS contract observers, but the costs of power requirements for operation of the sensors, display and associated electronics is assumed to be $20 monthly. Based on these assumptions, Figure 15 summarizes the facility costs for each of the various manual weather observation alternatives.

4. Summary

Figure 16 summarizes the analysis in this section by deriving unit life-cycle costs for each of the manual weather observation alternatives discussed. By further displaying the life-cycle cost of AWOS, as derived in Chapter III, Figure 16 provides a summarized cost comparison of alternatives for providing weather observation services at manned stations. The acceptable manual weather observing system options at locations with an active ATCT are those with either FAA, NWS personnel, or full-time WSCMO contract personnel taking observations. The Contract Basic option is not an acceptable alternative because its relatively lower cost is based only on limited weather observation coverage and does not reflect transmission of current weather observations to inbound aircraft. The exclusive use of SAWRS at an active ATCT is not considered an acceptable alternative since their weather observations, under current practice, are not always available to other users of the airport. Although these limitations could conceivably be overcome by contractual negotiation and higher costs, the life-cycle costs of these alternatives even with these limitations are greater than those of AWOS.

Figure 16 clearly shows that the life-cycle cost of AWOS at an airport with an active FAA ATCT is less than the life-cycle costs of any of the manual weather observing systems currently in use at manned stations. Additionally, the life-cycle cost of AWOS is less than the costs of manual systems when observations are recorded by personnel at an FSS station. The weighted average life-cycle cost of manual weather observing systems acceptable at locations with an active ATCT is nearly 4 times that for AWOS, a margin which makes AWOS cost effective even at the least active of part-time ATCT's. The comparative advantage of AWOS is even greater when considering that AWOS, when supplemented by controller input for present weather, provides at least as much and usually more service than manual weather observing systems. Therefore, locations with an active FAA ATCT where the surface weather observation function is the responsibility of the FAA automatically qualify for AWOS. Priority of AWOS establishment at these locations will be given to part-time facilities, followed by full-time facilities, in recognition of the relatively greater benefits of AWOS when facilities are closed. AWOS investment criteria for non-federal towered airports and locations that are identified as tower discontinuance candidates will be that used for non-towered airports, as developed in Section C of this chapter and summarized in Chapter II of this report.

The cost of weather observation personnel is by far the greatest single component of the life-cycle cost of each of the various manual weather observating systems. Analysis of Figure 16 shows that for the acceptable manual weather observing systems at FAA towered airports, the weighted life-cycle cost of weather observation personnel represents approximately 55 percent of the weighted total life-cycle cost. Given this materiality, the issue and nature of the costs of weather observation personnel needs to be further scrutinized.

"Cost savings" may be visualized from two perspectives--direct cost savings and efficiency gains. "Direct cost savings," as the name

FIGURE 15

Annual Facility Costs Associated With Manual Weather Observation Functions (1981 Dollars)*

	FAA and NWS Observation Stations (Except Contract Basic Stations)		SAWRS and Contract Basic Stations	
Building:				
Equipment Space (Sq. Ft.)		80		48
Observer Space	150		80	
Fraction of Time Devoted to Wx. Obs. Function	x.25	+ 37	x.25	+ 20
Total Space Requirement		117		68
Assumed Fair Rental Value/Square Foot		x 20		x 20
		$2,340		$1,360
Utilities:				
Equipment Space	117		68	
Utility Cost/Square Foot	x 2	234	x 2	136
Power for Sensors, Display and Associated Electronics		+ 360		+ 240
Total		$2,934		$1,736

*Source: Reference 2 (modified).

FIGURE 16

Summary of Unit Life-Cycle Costs of Weather Observing Systems at Manned Stations Operating 24 Hours Daily (1981 Dollars)

	Automated System1/	Manual Systems: FAA		Manual Systems: NWS			Manual Systems: Non-Govt.
					Contract		
Facilities and Equipment		ATCT	FSS	NWS Observer	WSCMO	Basic	SAWRS
Equipment (Other than Initial Spares)	$ 73,312	$ 47,480	$ 47,480	$ 47,480	$ 47,480	$ 6,730	$ 1,900
Initial Spares	+ 13,576	+ 11,870	+ 11,870	+ 11,870	+ 11,870	+ 1,683	+ 475
Total	$ 86,888	$ 59,350	$ 59,350	$ 59,350	$ 59,350	$ 8,413	$ 2,375
Operations and Maintenance							
Personnel:							
Observation	$ 2,162	$ 52,969	$ 40,225	$ 36,528	$ 84,300	$ 17,520	$ 21,168
Maintenance	712	21,124	21,124	21,124	21,124	10,562	300
Spares Inventory	1,629	5,697	5,697	5,697	5,697	807	228
Communications	2,920	0	486	4,266	4,266	4,266	0
Facilities	2,404	+ 2,934	+ 2,934	+ 2,934	+ 2,934	+ 1,736	+ 1,736
Total (Annual)	$ 9,827	$ 82,724	$ 70,466	$ 70,549	$118,321	$ 34,945	$ 23,432
x Life-Cycle Discount Factor2/	x 7.976	x 7.976	x 7.976	x 7.976	x 7.976	x 7.976	x 7.976
Total (15 Years)	$ 78,380	$659,807	$562,037	$562,699	$943,728	$278,721	$186,894
Total Life-Cycle Cost	$165,268	$719,157	$621,387	$622,049	$1,003,078	$287,134	$189,269
Relative Population of Acceptable Alternatives		x .25	x .36	x .37	x .02		
Contribution to Weighted Total		$179,789	$223,699	$230,158	$ 20,062		
Weighted Total		$653,708					
Typical Parameters							
Wind Direction and Speed	X	X	X	X	X	X	X
Ambient Temperature and Dew Point	X	X	X	X	X	X	X
Altimeter:							
Dual Altimeter Setting Indicators	X	X	X	X	X		
Altimeter Setting Indicator							X
Station Pressure						X	
Visibility	X	X	X	X	X		
Ceiling:							
Laser Ceilometer	X	X	X	X	X		
Sight Clinometer & Ceiling Light							X
Liquid Precipitation Quantity	X	X	X	X	X	X	
Signal Conditioning Equipment	X	X	X	X	X	X	
Display Terminal	X	X	X	X	X	X	

1/From Figures 2 and 3, after omitting costs associated with sensors for freezing precipitation and thunderstorm detection/location. Freezing precipitation and thunderstorm sensors are not envisioned to be included with initially implemented AWOS installations. Controller input for these and other present weather data are included in the cost of observation personnel.

2/Sum of (1/(1+i))n-0.5 for n = 1 to 15, where [illegible] implies, are where actual dollar outlays are reduced with output levels remaining at least constant. Conceptually, or theoretically, direct dollars savings can be realized through reduced staffing levels by replacing labor intensive manual weather observing systems with AWOS. Practically, however, human resources in the short-term are not as interchangeable and substitutable as other factors of production such as equipment and material. This constraint, however, is only short term. In the long-run all costs of production or output are variable. If cost savings are not desired in the direct sense by realizing actual reductions in dollars outlays, cost savings may be realized through "efficiency gains" in which output levels achievable with existing resources increase but actual costs remain constant. With reduced workload, resources can be shifted away from the weather observation function to other activities, thus increasing productivity. Theoretically, this gain should be measured by the opportunity value of the additional output or productivity which can now be realized.

Notwithstanding these "theoretical" considerations, arguments may be postulated from a "practical" sense that cloud the issue on whether or not observer cost savings should be recognized. In cases where FAA controllers perform the weather observation function, it may be argued that since staffing standards are based on peak activity periods and since weather observations are a secondary controller function and normally taken on a time-permitting basis during off-peak periods, any time savings afforded by AWOS has few if any productive alternative uses. In other words, direct cost savings may not be actually achieved since the weather observation function of controllers is only part-time and human resources aren't divisible (ignoring part-time employment), and efficiency gains aren't really achieved since the relatively small number of controller personhours released from the weather observation function wouldn't necessarily be used in a marginally productive manner (i.e., the released time may be productively idle if it is not actually channeled to additional time spent actually observing and controlling traffic). In cases where NWS personnel, NWS contract personnel or FSS personnel perform the weather observation function, these arguments are not as valid because the weather observation function in these cases is a primary rather than secondary function.

On the other hand, it can be argued that during periods of marginal, changing and hazardous weather, weather conditions must be monitored even during busy periods and, therefore, time is taken away from the primary function of controlling traffic.

Aside from the above arguments for and against the recognition of observer cost savings, AWOS can still be shown to be the most cost effective means of providing weather observation services at FAA towered airports on the basis of other cost savings. Figure 17 presents the life-cycle costs other than those for observation personnel for all of the acceptable weather system alternatives. Excluding all costs of observation personnel, the life-cycle cost of AWOS is only 48 percent of the weighted life-cycle cost of the acceptable manual weather observing systems! Even by <u>including</u> costs of observation personnel for AWOS and <u>excluding</u> them for the acceptable manual systems, AWOS still remains less costly.

Since the unit costs used to develop life-cycle costs of AWOS in this report are preliminary estimates, Chapter VII provides a sensitivity analysis of the key assumptions used in this analysis.

FIGURE 17

Unit Life-Cycle Costs of Acceptable Weather Observing Systems at Manned Stations Operating 24 Hours Daily Reduced by Life-Cycle Costs of Weather Observation Personnel (1981 Dollars)*

	Automated	FAA		NWS	
	System	ATCT	FSS	NWS Observer	WSCMO
Facilities and Equipment	$ 86,888	$ 59,350	$ 59,350	$ 59,350	$ 59,350
Operations and Maintenance					
Total Annual O&M	$ 9,827	$ 82,724	$ 70,466	$ 70,549	$118,321
Less Observation Personnel	- 2,162	-52,969	-40,225	-36,528	-84,300
Difference	$ 7,665	$ 29,755	$ 30,241	$ 34,021	$ 34,021
x Life-Cycle Discount Factor	x 7.976	x 7.976	x 7.976	x 7.976	x 7.976
O&M Less Observ. Personnel	$ 61,136	$237,326	$241,202	$271,351	$271,351
Total Life Cycle Cost Less Observation Personnel	$148,024	$296,676	$300,552	$330,701	$330,701
Contribution to Weighted Total		x .25	x .36	x .37	x .02
		$ 74,169	$108,199	$122,359	$ 6,614
Weighted Total		$311,341			

*From Figure 16.

C. Non-Towered and Non-Federal Towered Airports

1. Introduction

Turning now from FAA towered airports to non-towered and non-federal airports, the analysis becomes one based on benefit/cost considerations rather than cost-effectiveness because weather observation services aren't necessarily and universally required or justified at non-towered and non-federal towered airports. In other words, the question becomes not one of identifying the most cost effective means of providing weather observations but rather whether to do so at all. This section explains the nature and quantitative valuation of the benefits of AWOS at non-towered and non-federal towered airports. The corresponding costs were discussed earlier in Chapter III. Safety benefits, addressed in Section C-2, result from reduced risk and incidence of accidents for which unfavorable winds, density altitude, low ceiling and/or visibility, or precipitation are causes and/or factors. Efficiency benefits, addressed in Section C-3, result from cost avoidance realized by commercial operators whose weather observation function would be replaced with AWOS, reduced risk and incidence of diversions and cancellations of actual and would-be instrument approaches and overflights by visual approaches. Section C-4 outlines proximity penalty and remoteness premium provisions which compensate for close proximity to or remoteness from a full-time, non-automated FAA/NWS/NWS Contract surface weather observation station.

2. Safety Benefits

a. Air Carrier and Air Taxi

FAR Parts 121 (for air carrier) and 135 (for air taxi) require an approved weather observation service for commercial instrument flight operations. When a Part 121 or 135 operator desires to serve an airport for which neither the FAA or the NWS have regular weather observation service or serve it during hours when the service is unavailable, operators often resort to self-operated Supplementary Aviation Weather Reporting Stations (SAWRS). An AWOS installed at an airport which theretofore had a SAWRS would result in cost avoidance to the operator since the need for SAWRS would be eliminated. This cost avoidance is the basis upon which benefits are ascribed to these user classes in this report. While SAWRS benefits lie in both the safety and flight efficiency areas, cost avoidance is an efficiency benefit and further discussion of it is deferred to Section C-3 of this chapter along with other efficiency benefits of AWOS.

b. General Aviation

(1) Introduction

The approach taken in this safety benefits assessment of AWOS for general aviation at non-towered and non-federal towered airports is (1) to isolate the number, nature and severity of historic accidents which could have been prevented if the pilots involved had prior or improved knowledge of the weather, and (2) to compute the total costs and the per activity unit costs or losses associated with these accidents, or conversely, the total and per activity unit benefits of preventing such accidents. Before addressing the accident analysis in detail, a brief statistical background of total weather-related general aviation accidents is provided to enable the reader to picture avertable general aviation accidents in their proper perspective.

In the years from 1970 through 1979, the numbers of total and fatal general aviation accidents and the numbers of total and fatal general aviation accidents involving weather have remained somewhat constant. The accident rates per operation and per hour flown, however, have decreased with increasing aviation activity over time. Figures 18 and 19 illustrate these trends.

Figure 20 highlights the most common types of weather phenomena attributed by NTSB as being causes or factors in weather-related general aviation accidents from 1975 through 1979. It is noted that unfavorable wind conditions were cited both as a cause and a factor more often than was any other weather phenomenon.

(2) Accident Analysis

To estimate the number of accidents which might be prevented by AWOS at non-towered and non-federal towered airports, this analysis compares the historic weather-related accident rate where there were no weather observations with that where there were observations. This comparison was made by examining NTSB briefs of all U.S. general aviation accidents involving weather as a cause and/or factor that occurred in calendar year 1979 in either the approach or landing phases of operation. This examination was made by a group of experienced pilots from FAA-APO-230 and Kentron International, Inc. For each accident brief, the group ascertained whether the existence of state-of-the-art AWOS sensoring devices would or would not have probably prevented the accident. Each of the above underscored parameters is discussed below in further detail.

First, general aviation accidents for which weather was cited as either a cause or a factor, or both, were taken into account in this safety benefits analysis. In addressing probable cause(s) of an accident, the NTSB considers all facts, conditions and circumstances. The object is to ascertain those cause-effect relationships in the accident sequence about which something can be done to prevent recurrence of the type of accident under consideration. The term "factor" is used, in general, to denote those elements of an accident which further explain or supplement the probable cause(s).* Referring back to Figure 20, it is observed that all weather cause citations combined from 1975 through 1979 accounted for only 1.31 percent of the total causes cited for that period. In contrast, weather-related factors were cited with great regularity in general aviation accidents--they accounted for 31.5 percent of all factor citations. One possible explanation for this higher rate is the inability to determine exactly what part weather plays in an accident. That is to say that investigators may, with great regularity, suspect

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*Probable Cause(s) - "Condition(s) and/or event(s), or the collective sequence of conditions and/or events that most probably caused the accident to occur. Had the conditions and/or events been omitted from the sequence the accident would not have occurred" (NTSB).

Factor(s) - "Related condition(s) or event(s) which existed or occurred coincident with the condition(s) and/or event(s) that most probably caused an accident but which may or may not contributed significantly to the accident. The omission of factor(s) from the occurrence would not necessarily have prevented the accident" (NTSB).

FIGURE 18

General Aviation Accidents, 1970-1979

Year	GA Activity (Millions)		Total GA Accidents			Fatal GA Accidents				
				Accident Rate			Accident Rate		Fatalities	
	Aircraft Opns.[1]	Hours Flown[2]	No.[3]	Per Million Opns.	Per Million Hrs.	No.[3]	Per Million Opns.	Per Million Hrs.	No.[3]	No. Per Accident
1970	113.3	26.030	4,712	41.58[4]	180.98[4]	641	5.65[4]	24.59[4]	1,310	2.04
1971	109.7	25.512	4,648	42.37	182.19	661	6.03	25.91	1,355	2.05
1972	118.6	26.974	4,256	35.86[4]	157.67[4]	695	5.83[4]	25.65[4]	1,426[5]	2.05
1973	122.2	29.974	4,255	34.80[4]	141.89[4]	723	5.90[4]	24.05[4]	1,412	1.95
1974	126.8	31.413	4,425	34.88[4]	140.80[4]	729	5.73[4]	23.14[4]	1,438	1.97
1975	134.2	32.024	4,237	31.56[4]	132.24[4]	675	5.01[4]	21.02[4]	1,345	1.99
1976	138.5	33.922	4,193	30.25[4]	123.49[4]	695	4.99[4]	20.37[4]	1,320	1.90
1977	142.8	35.792	4,286	30.00[4]	119.78[4]	702	4.91[4]	19.59[4]	1,436	2.05
1978	147.0	39.409	4,494	26.98[4]	113.98[4]	793	4.75[4]	20.07[4]	1,770[5]	2.23
1979	151.3	43.340	4,023	26.59	92.82	678	4.48	15.64	1,367	2.02
Mean	130.4	32.439	4,353	33.49[4]	138.58	699	5.33[4]	22.00	1,418	2.03
Std. Dev.	-	-	214	5.48[4]	28.68	42	0.56	3.24	132	0.09
Annual Rate of Change	.0327	.0583	-.0174	-.0485	-.0715	-.0063	-.0255	-.0490	.0047	-.0011

1/Source: Reference 13.
2/Source: References 14 and 15.
3/Source: Reference 16. Data represents latest revisions. Except for 1979, accident totals exclude all U.S. registered aircraft accidents on foreign soil.
4/Suicide/sabotage accidents included in all computations except accident rates (1970-1, 1972-3, 1973-2, 1974-2, 1975-2, 1976-4, 1977-1, 1978-2).
5/Includes air carrier fatalities (1972-5, 1978-142) when in collision with general aviation aircraft.

FIGURE 19

General Aviation Weather-Related Accidents, 1970-1979

	GA Activity (Millions)		Total GA Accidents			Fatal GA Accidents				
				Accident Rate			Accident Rate		Fatalities	
Year	Aircraft Opns.1/	Hours Flown2/	No.3/	Per Million Opns.	Per Million Hrs.	No.3/	Per Million Opns.	Per Million Hrs.	No. 3/	No. Per Accident
1970	113.3	26.030	1,026	9.06	39.42	244	2.15	9.37	588	2.41
1971	109.7	25.512	959	8.74	37.59	255	2.32	10.00	597	2.34
1972	118.6	26.974	974	8.21	36.11	285	2.40	10.57	685	2.40
1973	122.2	29.974	967	7.91	32.26	278	2.27	9.27	619	2.23
1974	126.8	31.413	1,014	8.00	32.28	302	2.38	9.61	702	2.32
1975	134.2	32.024	1,005	7.49	31.88	287	2.14	8.96	645	2.25
1976	138.5	33.922	908	6.56	26.77	262	1.89	7.72	601	2.29
1977	142.8	35.792	952	6.67	26.60	258	1.81	7.21	608	2.36
1978	147.0	39.409	928	6.31	23.55	322	2.19	8.17	759	2.36
1979	151.3	43.340	881	5.82	20.35	276	1.82	6.37	620	2.25
Mean	130.4	32.439	961	7.48	30.68	277	2.14	8.73	642	2.32
Std. Dev.	-	-	47	1.09	6.23	24	.22	1.32	56	.06
Annual Rate of Change	.0327	.0583	.0168	-.0480	-.0708	.0138	.0183	-.0420	.0059	-.0076

1/Source: Reference 13.
2/Source: References 14 and 15.
3/Source: Reference 17. Data represents latest revisions.

FIGURE 20

Weather Phenomena as a Cause/Factor in Weather-Related Accidents, U.S. General Aviation, 1975-1979*

Weather Phenomenon	1975 C	1975 F	1976 C	1976 F	1977 C	1977 F	1978 C	1978 F	1979 C	1979 F	Total, 1975-1979 C	%	F	%
Low ceiling		222	2	199	2	196	1	241	1	235	6	1.27	1,093	22.30
Rain		85		76		93		98		89			441	9.00
Fog	2	168	3	146	2	161		172		179	7	1.48	826	16.85
Snow		53	1	46		37	1	61		52	2	.42	249	5.08
Hail		2		2	1	2		1	1		2	.42	7	.14
Icing conditions-includes sleet, freezing rain, etc.	5	47	5	38	1	31	3	46	3	46	17	3.60	208	4.24
Conditions conducive to carb/ induction system icing	2	77		58		60		53		58	2	.42	306	6.24
Unfavorable wind conditions	63	258	65	254	31	283	24	275	18	260	201	42.58	330	6.73
Wind shear	3	2	9	3	5	7		8	1	13	18	3.81	33	.67
Sudden windshift	12	22	10	11	15	20	7	13	7	15	51	10.81	81	1.65
Turbulence in flight, clear air	5	6	5	11	1	10	2	6		4	13	2.75	37	.75
Turbulence associated with clouds and/or thunderstorms	6	26	5	21	3	26	4	18	3	22	21	4.45	113	2.31
Downdrafts, updrafts	17	57	24	60	14	67	10	43	5	64	70	14.83	291	5.94
Local whirlwind	12	1	4	3	9	2	4	2	5	3	34	7.20	11	.22
Tornado			1			1	1		1	2	3	.64	3	.06
Squall line		1		1		1		3		3			9	.18
Adverse winds aloft		3	1	5	1	2		4		1	2	.42	15	.31
High temperature		14		19		27	1	28		5	1	.21	93	1.90
Obstructions to vision		14		13		16	1	17		12	1	.21	72	1.47
High density altitude (Temp./Dew Point)		87	2	83		97	2	78		81	4	.85	426	8.69
Thunderstorm activity	4	45	5	40	2	44	5	47	1	52	17	3.60	228	4.65
Other		3		5		8		5		9			30	.61
Total Weather C's/F's Cited	131	1,193	142	1,094	87	1,191	66	1,219	46	1,205	472	100.00	4,902	100.00
Total C's/F's Cited	7,970	3,576	7,934	3,245	7,395	2,948	6,473	2,694	6,150	3,098	35,922	100.00	15,561	100.00
% of Total C's/F's Represented by Weather C's/F's	1.64	33.36	1.79	33.71	1.18	40.40	1.02	45.25	0.75	38.90	1.31	-	31.50	-

*Source: References 16 and 17. Data represents latest revisions. Note that these data represent the number of times the weather phenomenon was cited as a cause and factor, and not the number of related accidents. The number of cause/factor entries made for one accident varies from 1 to a maximum of 10 and averages between 2 and 3.

weather to be a cause but are unable to support such suspicions. It can be conjectured that they then resort to citing it is a factor. Furthermore, no two investigators think or code an accident in precisely the same manner. There are indications in the accident records that the problems associated with weather are not solely meteorological ones. In the cases where weather causes/factors are cited, there exists a high degree of common accident citation with pilot judgment error and operational decision error causes/factors. This observation indicates that the possible problem in this area is the lack of effectiveness of part of the general aviation pilot population to gather, interpret and make decisions about weather conditions. Aside from the cause/factor assignments in the NTSB briefs and as pointed out above, this analysis includes only those accidents which a group of experienced pilots found to be either probably preventable or probably not preventable given the existence of state-of-the-art automated weather sensoring devices.

Second, the comparison of accident rates between observation and non-observation environments was limited to a single year. Because of the relatively small variance in the numbers of weather-related accidents between years, as evidenced in Figure 19, this comparison assumes 1979, the most recent year for which NTSB accident records are completed and approved for release, as being representative of an average year.

Third, and finally, this safety benefits analysis rests on general aviation accidents that occurred in either the approach or landing phases of operation. The majority of weather-related accidents occur during these phases of flight. The rationale for excluding accidents occurring during takeoff and climb is that pilots should have adequate knowledge of prevailing weather at the departure airport. While it is conceivable that AWOS might reduce the number of accidents during takeoff, climb and cruise, no benefits are directly ascribed to them in this analysis. They are qualitatively discussed in Section D of this chapter with other indirect or intangible benefits.

To summarize the approach to quantifying the expected safety benefits of AWOS at non-towered and non-federal towered airports:

$$\text{Preventable Accident Rate Per Activity Unit} = \frac{\text{No. of WX-Related Approach/Landing Accidents w/o WX Observations in 1979}}{\text{Activity without Weather Observations}} - \frac{\text{No. of WX-Related Approach/Landing Accidents with WX Observations in 1979}}{\text{Activity with Weather Observations}}$$

The numerators in the above ratios were derived by (1) examining NTSB briefs of U.S. general aviation accidents involving weather as a cause and/or factor that occurred in CY 1979 in either the approach or landing phases of operation, and (2) cross-referencing the accident sites and time of accident with an inventory of weather observing stations and their respective operating hours. A statistical summary of accidents in both "with" and "without" observation environments are summarized in Appendices A-1 and A-2, respectively.

The denominators in the above ratios are derived separately by accident cause/factor: low ceiling/visibility accident rates per general aviation itinerant operation; and all others separately per general aviation itinerant operation and local operation. Local operations are performed by aircraft which operate in the local traffic pattern of the airport or within sight of the tower, are known to be departing for, or arriving from, flight in local practice areas within 20 miles of the airport, or executing simulated instrument approaches or low passes at the airport. Itinerant operations are all operations other than local operations. Low ceiling/visibility accident rates are denominated in itinerant operation terms because AWOS sensors for ceiling and visibility would have little impact on the incidence of VFR approaches and most IFR approaches are itinerant. Information provided by AWOS on wind, temperature, dew point, precipitation and thunderstorms benefit both types of operation, but more so itinerant than local. Pilots in local flight arrivals, many of which are of a local practice or touch-and-go nature and of relatively short duration, are likely to have some foreknowledge of local prevailing weather conditions.

Operations counts at FAA towered airports are generally viewed as being more reliable than those at non-towered airports. Emphasis has historically been placed on towered airport operation counts for a number of reasons. First, towered airports represent the largest and most active airports in the country. Secondly, towered airports include most of the air carrier airports and therefore their operations data satisfies a popular area of interest, i.e., air carrier traffic. Third, FAA towered airports are the sites where FAA personnel are located and one of the objectives of operations counts is the determination of the requirements for the size of field staffs. The number of active aircraft, hours flown and pilot registrations are also, to an extent, indicators of general aviation activity in the U.S. and forecasts of such parameters are made annually by the FAA. Actual aircraft operations, however, are the truest representation of traffic for facility investment planning purposes. In light of the sensitivity of activity counts on the safety benefits estimated from weather observation systems, a review was made of alternative measures of general aviation activity rather than relying on one as being the best or preferred estimate. The results of this review are outlined in Figure 21 for calendar year 1979.

Accepting the mean in Figure 21 of 151,440,000 operations in CY 1979, the task then becomes determining how many were itinerant and how many were local and for each of these categories how many occurred with weather observations available and how many in environments with weather observations unavailable. The "weather station status," "tower," and "FSS on airport" codes of the September 1980 National Flight Data Center (NFDC) data base (Reference 22) were used to segregate locations and their respective general aviation operations with and without a weather station on site. The data base was supplemented by other agency data to enhance accuracy and completeness (Reference 21). The September 1980 NFDC data base was used because it was thought to best represent activity occurring in CY 1979. Figure 22 summarizes the analysis. Because total general aviation operations recorded in the data base did not represent the entire population (per Figure 21), the counts were proportionately inflated to represent the entire universe of operations.

FIGURE 21

Estimates of Total General Aviation Operations - CY 1979

General Aviation Pilot and Aircraft Activity Survey (Reference 18)	Survey conducted by the FAA in conjunction with the Civil Air Patrol.	158,360,000* (public use airports only)
Systems Consultants, Inc. (Reference 13)	National GA Operations = $10^6 \times (70 + 4.28 \text{ (Year-1960)})$	151,320,000
QUESTEK Corp. (Reference 19)		144,640,000
Mean		151,440,000

*155,600,000 operations in CY 1978 (per Reference 9) x 51.7/50.8 (ratio of millions of GA operations at FAA towered airports, FY 1979 to FY 1978, per Reference 20). Overstated due to inclusion of air taxi operations but understated by exclusion of non-public use airports. Assumed to be offsetting for these purposes.

As mentioned earlier, low ceiling/visibility accident rates are first denominated in terms of instrument approaches and then converted to and in terms of itinerant operations. These rates are first denominated in terms of annual instrument approaches (AIA's) because low ceiling/visibility accidents correlate best with instrument approach activity. Unfortunately, for reasons which will be explained later, reported counts of instrument approaches are unreliable for many non-towered airports. To correct for and guard against unreliable site-specific data, accident rates per instrument approach are converted to more reliable rates per itinerant operation through a generally accepted regression model. The first step of this exercise is to derive estimates of instrument approach activity with and without weather observations available. These are derived in Figure 23 for CY 1979.

FIGURE 22

General Aviation Operations With and Without Weather Observations Available, CY 1979

	GA Operations 1/			Percent		Adjusted to Enter Universe 3/	
	Local	Itinerant	Total	Itinerant	Total	Itinerant	Total
Airports With Observations Available (Where Weather Station Code and/or Tower Code and/or FSS on Site = Yes)	30,087,288	40,617,984	70,705,272	66.03	52.79	45,925,093 2/	79,945,176 4/
Airports Other Than Above	42,341,634	20,892,670	63,234,304	33.97	47.21	23,625,313 3/	71,494,824 5/
Total	72,428,922	61,510,654	133,939,576	100.00	100.00	69,547,580	151,440,000

1/Source: Reference 22.
2/40,617,984 x (151,440,000/133,939,576). To preclude specious accuracy, this estimate is rounded to 45,930,000 in the ensuing analysis.
3/20,892,670 x (151,440,000/133,939,576). Rounded to 23,630,000 in the ensuing analysis.
4/52.79% x 151,440,000 (from Figure 21).
5/47.21% x 151,440,000 (from Figure 21).

FIGURE 23

CY 1979 General Aviation Instrument Approaches With and Without Weather Observations Available

Facility[1]	W/O WX Observ.	W WX Observ.
Towered Airports, FY 1979[2]		919,457
Non-towered and Non-federal Towered Airports, FY 1979[2]	186,544	
Non-towered Airports with FSS on Site, FY 1979[3]	(30,140)	30,140
	156,404	949,597
CY 1979 Adjustment Factor[4]	x 1.0127	x 1.0127
Total, CY 1979[5]	158,390	961,657
Percent	14.141	85.859

1/Airports with an NWS observation facility on site but without an FAA ATCT or FSS are excluded. Operations at such airports are relatively nominal.

2/Source: Reference 23 and 24.

3/Source: References 23, 24, and 25.

4/Because the operations counts are for Fiscal Year 1979 (October 1978 - September 1979), they must be adjusted to Calendar Year 1979 (January 1979 - December 1979) to be consistent with other parts of this safety benefits analysis. For approximately 4,000 airports, the Terminal Area Forecasts (Reference 26) report 120.5 and 126.6 million national general aviation operations for Fiscal Years 1979 and 1980, respectively. This data suggests a fiscal to calendar year conversion factor of 1.0127, ignoring compounding, seasonality and other factors (((120.5 x 9/12) + (126.6 x 3/12))/120.5).

5/To preclude specious accuracy, these estimates are rounded to 158,000 and 962,000 in the ensuing analysis.

As mentioned at the outset of this accident analysis description, the difference in rates of accidents at sites with and without weather observations available is used to estimate the effect of weather observation systems on accidents. The number of cause/factor entries made for any one accident by the NTSB is determined by the judgment of the accident analyst(s), investigator(s) or board member(s) of the NTSB itself and varies with the type of aircraft and injury level. The number of cause/factor entries per accident varies from 1 to a maximum of 10, and averages between 2 and 3. The cause/factor and other NTSB data entries, supplemented with other relevant data, provides enough information about accidents to permit a reasonable assessment of whether or not a weather observation might have prevented the accident.

But this procedure yields the expected number of accidents that might be affected, which is greater than the number that would be prevented. The difficulty with this approach is that other systems may be influencing the accident rate perhaps as much or more than the weather observation itself. One such system is the availability of a precision approach system, as it affects the accidents related to low ceiling/visibility. Airports with higher levels of traffic tend to have both precision approaches and weather observations. So it is difficult to determine which is actually lowering the rate. Although similar difficulties occur with cause/factors other than ceiling/visibility, the difficulty is especially significant here because a major portion of the safety benefit of AWOS at non-towered airports is the reduced risk and incidence of this type of accident. Besides precision approaches, other influences may include airport environment, pilot competence, etc. The unadjusted difference in low ceiling/visibility accidents (from Figure 25) is:

Acc. Rate W/O WX Obs. - Acc. Rate W WX Obs.

$$= \frac{25 \text{ accidents}}{158{,}000 \text{ AIA's}} - \frac{27 \text{ accidents}}{962{,}000 \text{ AIA's}}$$

$$= .0001582 \text{ per AIA} - .0000281 \text{ per AIA}$$

$$= 1.301 \times 10^{-4} \text{ per AIA}$$

To correct for the influence of precision approach systems and other factors on the "with" weather observation accident rate, the .0000281 value is inflated by the number of times the historic non-precision instrument approach accident rate exceeds the historic precision instrument approach accident rate (3.5 derived from References 10 and 27). The result must then be adjusted by the ratio of precision instrument approaches to total instrument approaches (.73 in 1979):

$$\frac{27 \text{ accidents}}{962{,}000 \text{ AIA's}} \times 3.5 \times .73 = .0000717$$

Substituting,

$$.0001582 \text{ per AIA} - .0000717 \text{ per AIA}$$

$$= .865 \times 10^{-4} \text{ per AIA}$$

It is acknowledged that precision approach systems may have influenced the "without" weather observation accident rate also, but intuitively to only a small degree since relatively few of the instrument approaches in the "without" weather observation environment were precision. It is hoped that this omission is offset by other factors that may influence accident rates but which are not accounted for in this analysis.

Historically, there have been numerous instances where inaccurate AIA counts have been obtained. Reported AIA counts of less active non-towered airports especially appear to be erratic and understated. AIA's at these sites are often obtained using pilot reports, IFR flight plan data, or counts by a neighboring airport. At smaller airports--those that fall far below establishment levels for precision approach facilities but which might otherwise be eligible for an AWOS--there has been little incentive to maintain accurate records of instrument approach activity. Another explanation for AIA inaccuracies is the ambiguity of the definition. Key questions focus on how to treat approaches when the pilot cancels an IFR flight plan while in the air and on the correct identification of the minimum initial approach altitude for each aircraft category. Lastly, it is believed that AIA reporting is typically given low priority by air traffic controllers with actual AIA counting occurring on a time-available basis.

A preferred alternative to using reported general aviation AIA's is to estimate AIA_{GA} based on annual general aviation itinerant operations and the probability that the weather will require an instrument approach. Systems Control, Inc., (Reference 28) derived the following model for accomplishing this:

$$AIA_{GA} = \frac{GAITN}{2} \times (P_{IFR} - P_C) \times (.8 - .5R)$$

where

GAITN is the number of annual general aviation itinerant operations,
P_{IFR} is the probability of weather below VFR minima (which is assumed here to be weather in which the visibility is 3 miles or less and/or the ceiling is at a below the minimum initial approach altitude),
P_C is the probability of weather below IFR minima, and
R is the ratio of general aviation operations to total operations.

The divisor in the first term reflects the assumption that half of operations are landings. The second term ($P_{IFR} - P_C$) measures the portion of time that an instrument approach is necessary and can be completed. Accurate determination of this term depends on site specific values of P_{IFR} and P_C. For a national average, more than 1,000 instrument approach plates were examined and it was determined that the nonprecision approach ceiling minimum for general aviation aircraft is 700 without and 600 with an approved altimeter setting source. The frequency of instrument weather below these ceilings can be obtained from Figure 24, based on average historic distributions of hourly ceiling and visibility observations. A 700 foot ceiling and visibility of 1 mile yields a value of 4.95 percent for P_C and the VFR minimum ceiling of 1500 feet and visibility of 3 miles yields a value of 13.50 percent for P_{IFR}. The third term (.8 - .5R) tends to reflect what fraction of flights have pilots qualified and aircraft equipped to make instrument approaches. Note that if a location that doesn't have an approved instrument approach procedure, AIA_{GA} would equal zero since P_C would equal P_{IFR}.

FIGURE 24

Percentage Distribution of Weather Observations Less than Selected Ceilings and Visibilities*

Ceiling (feet)	Visibility (miles) 1/16	1/8	1/4	1/2	3/4	1	1-1/2	3
100	0.34	0.43	0.65	0.99	1.43	1.95	3.10	7.09
200	0.71	0.76	0.89	1.12	1.52	2.02	3.14	7.10
300	1.21	1.24	1.34	1.48	1.79	2.22	3.26	7.13
400	1.89	1.92	2.00	2.13	2.37	2.72	3.63	7.29
500	2.67	2.69	2.77	2.88	3.09	3.39	4.20	7.61
600	3.46	3.49	3.56	3.67	3.84	4.10	4.82	7.99
700	4.36	4.39	4.46	4.57	4.72	4.95	5.60	8.57
800	5.26	5.29	5.36	5.46	5.60	5.81	6.40	9.15
1,000	7.04	7.07	7.14	7.24	7.36	7.54	8.05	10.48
1,500	10.63	10.66	10.73	10.82	10.92	11.06	11.47	13.50
2,000	13.33	13.35	13.42	13.51	13.60	13.74	14.09	15.92
3,000	17.90	17.93	18.00	18.08	18.18	18.29	18.60	20.22

*Source: Derived from Reference 29.

Using this regression model and national average values, the accident rate differential for low ceiling/visibility accidents can be redenominated from per AIA terms to per itinerant operation terms as follows:

$$.865 \times 10^{-4} \text{ per AIA}$$

$$= .865 \times 10^{-4} \text{ per } ((GAITN/2) \times (PIFR - PC) \times (.8 - .5R)$$

$$= .865 \times 10^{-4} \text{ per } ((GAITN/2) \times (.1350 - .0495) \times (.8 - .5(.85))$$

$$= 1.387 \times 10^{-6} \text{ per GAITN}$$

The above result will be applicable, of course, only to candidate sites that either already have approved standard instrument approach procedures (SIAP's) or potential SIAP's as the result of installing AWOS. For other candidate sites, this benefit will be suppressed since the benefit accrues essentially only to IFR approaches. Also, this benefit value will be used in the Phase I criteria and for cases where site-specific data are not available. When site-specific data are available, they will be used in the Phase II screening process to compute the site-specific safety benefits afforded by ceiling and visibility sensors.

In addition to low ceiling/visibility accidents, the accident rates with weather observations available for other weather phenomena must also be adjusted for the potential influence that other factors might have. Lacking more specific data, the relative adjustment made to the low ceiling/visibility accident rate with observation available is also applied to the other weather phenomena ($(.717 \times 10^{-4})/(.281 \times 10^{-4})$ or approximately 2.55). These adjustments are illustrated in Figure 25 which summarizes the results of this section. As mentioned earlier, this analysis extends benefits of AWOS detection and reporting of wind, temperature, dew point, precipitation and thunderstorm information separately for itinerant and local operations. Reference 18 suggests that approximately 70 percent of general aviation itinerant operations and 40 percent of general aviation local operations (in both instances excluding air commuter and air taxi from the data base) utilize some source of inflight weather information service. By rough analogy, the ratio of 40 percent to 70 percent, or approximately 60 percent, is used as the ratio of benefits of local operations to itinerant operations.

c. Military

Because the characteristics of military aircraft which use civil non-towered and non-federal towered airports are reasonably akin to those of general aviation aircraft (at least within the accuracy of this analysis), the benefits derived in this chapter for the general aviation user class are also ascribed to the military user class. As with reported counts of annual AIA's of general aviation aircraft at non-towered airports, reported AIA's of military aircraft may also be questionable. To guard against this possibility, benefits attributable to reduced accidents related to low ceiling/visibility are denominated in per itinerant operation terms and will apply only to those candidate sites with existing standard instrument approach procedures (SIAP's) or potential SIAP's as the result of installing AWOS.

d. Accident Costs

Accident costs consist of losses associated with personal injuries and property damage. Personal injuries are categorized by fatalities, serious injuries, minor injuries and no injuries. Property damage is categorized by aircraft damage and damage to other property. Aircraft are damaged to varying degrees in aviation accidents. Some are completely destroyed, others substantially damaged, and some incur only minor damage or none at all. Because of the high degree of variability in damage to nonaircraft property, no direct allowances are made for such losses in this report. This omission is immaterial because the types of accidents pertinent to this analysis seldom result in physical damage to property other than the aircraft.

The unit values attached to these losses or "critical values" in this report are taken from Report Number FAA-APO-81-3, Economic Values For Evaluation of Federal Aviation Administration Investment and Regulatory Programs (Reference 9). Adjustment of the critical values derived in Reference 9 to 1981 dollars is outlined in Appendix B. Each critical value is briefly described below.

FIGURE 25

Summary Statistics of Avertable General Aviation Accidents Involving Weather As A Cause/Factor in CY 1979

	No. of Accidents1/		GA Activity (000)2/		Accident Rate W/O WX Observ. (x 10^{-6}) Per		Accident Rate With WX Observ. (x 10^{-6}) Per		Difference x 10^{-6} Per	
	W/O WX Observ.	With WX Observ.	W/O WX Observ.	With WX Observ.	Itin. Opn.	Local Opn.3/	Itin. Opn.4/	Local Opn.3/	Itin. Opn.	Local Opn.
Unfavorable Winds and Wrong Runway	140	40	23,630 ITN	45,930 ITN	5.925	3.555	2.221	1.333	3.704	2.222
Temperature/Dew Point	5	2	23,630 ITN	45,930 ITN	.212	.127	.111	.067	.101	.060
Low Ceiling/Visibility	25 5/	27 5/	158 AIA	962 AIA	6/	6/	6/	6/	1.387 6/	-
Rain, Hydroplanning or Wet Runway	4	1	23,630 ITN	45,930 ITN	.169	.101	.056	.034	.113	.067
Thunderstorms	2	1	23,630 ITN	45,930 ITN	.085	.051	.056	.034	.029	.017

1/Source: Appendices A-1 and A-2. The numbers of accidents listed here are less than those outlined in Figure 19 because of the parameters guiding this analysis (as outlined at the outset of this accident analysis).
2/Source: Figure 22.
3/60 percent of that per itinerant operation (see text).
4/Inflated to allow for factors other than weather observations which may have influenced accident rate differentials. See text.
5/Represents only those accidents in which aircraft was on IFR approach. VFR approach accidents were excluded because the existance of an operating weather observing system would probably have had little influence on the course of events.
6/Derived in text.

(1) Value of a Statistical Life. The somewhat subjective and conceptual construct of the value of a statistical life is a basic tool of economists, program planners and others interested in measuring the social benefits associated with investments and regulatory actions in public programs. Although life is felt to be precious and essentially invaluable, economic decisions must be made continually, either explicitly or implicitly, between safety and other competing demands for limited resources. Literature on the subject suggests values ranging from tens of thousands of dollars to several million dollars. Reference 9 outlines alternative approaches to valuing life and finds the "value to self and others" approach to be the most concept ally sound and comprehensive measure for FAA investment and regulatory decisionmaking purposes. As the name suggests, this approach takes into account the value of life to the individual as well as the value of the individual's life to the rest of society. Appendix B illustrates the derivation of the value of a statistical life of $580,000 in 1981 dollars.

(2) Unit Costs of Statistical Aviation Injuries. Similar to the value of a statistical life, Reference 9 finds the "value to self and others approach" to provide the most conceptually sound and comprehensive measure of the costs of statistical aviation injuries. Appendix B illustrates the derivation of the estimated unit costs of statistical serious and minor aviation injuries of $42,000 and $16,000, respectively, in 1981 dollars.

(3) Unit Costs of Aircraft Damage. The loss of an aircraft completely destroyed can be taken as the market value of an equivalent replacement. By using actual market values, depreciation and obsolescence are implicitly taken into account. Insurance experience reveals that the average restoration cost of a substantially-damaged aircraft is approximately one-third of its market or replacement value. Repair costs of aircraft incurring minor damage are assumed in this report to be 50 percent of those for substantially-damaged aircraft. Appendix B illustrates the derivation of unit losses associated with various aircraft type categories and degrees of damage in 1981 dollars.

To derive the total historic accident costs associated with weather phenomena which are detectable/measurable by AWOS, the unit critical values updated in Appendix B must be matched against the numbers and severity of personal injuries and aircraft damage. This is done in Figure 26 for each relevant weather cause/factor by quantifying in dollar terms the total costs of the accidents in Appendix A. It is noted that the costs of accidents for which low ceiling or visibility was cited as a cause/factor far exceed the costs of the other accidents.

e. Derivation of Safety Benefits Per Aviation Activity Unit

Given the expected accident costs associated with the various relevant accident cause/factors and the accident statistics from Appendix A, the task now is to translate the costs per accident into costs per activity unit or conversely, the expected contributory benefit per activity unit. This is accomplished in Figure 27. Although the safety benefits derived in this section are computed only for accidents occurring in the approach

FIGURE 26

Costs of General Aviation Accidents Occuring in CY 1979 For Which Cause(s)/Factor(s) Were Cited Which Are Detectable/Measurable By AWOS (Thousands of 1981 Dollars)

Cause/Factor	Personal Injuries: Number[1] Fatal	Serious	Minor	Costs: Fatal (@ $580)	Serious (@ $42)	Minor (@ $16)	Aircraft Damage: No. Destroyed x $50	No. Substantial x $16	No. Minor x $8[2]	Total Accident Costs
Unfavorable Winds or Wrong Runway	8	18	47	$ 4,640	$ 756	$ 752	$ 750	$2,592	$8	$ 9,498
Temperature/Dew Point	0	0	4	0	0	64	0	112	0	176
Low Ceiling/Visibility[3]	63	25	17	36,540	1,050	272	1,750	272	0	39,884
Rain, Hydroplanning or Wet Runway	0	2	0	0	84	0	50	64	0	198
Thunderstorms	0	0	1	0	0	16	0	48	0	64
Totals	71	45	69	$41,180	$1,890	$1,104	$2,550	$3,088	$8	$49,820

1/Source: Appendix A. These data are less than those displayed in Figure 19 because this analysis includes only those accidents which a group of experienced pilots found to be probably preventable given availability of weather observations.

2/The unit cost of an aircraft incurring minor damage is assumed to be 50 percent of that of a substantially-damaged aircraft.

3/Includes statistics for only those accidents in which the aircraft involved was on an IFR approach.

FIGURE 27

Safety Benefits Per General Aviation and Military Activity Unit By Weather Phenomenon at Non-Towered and Non-Federal Towered Airports

Weather Phenomenon	Expected Preventable Accident Rate ($x10^{-6}$)1/ Per Itinerant Operation	Per Local Operation	Expected Cost Per Accident2/	Expected Benefit Per Itin. Opn.	Local Opn
Unfavorable Winds and Wrong Runway	3.704	2.222	$53,000	$.1963	$.1178
Temperature/Dew Point	.101	.060	25,000	.0025	.0015
Low Ceiling/Visibility	1.387	-	767,000	1.064	-
Rain, Hydroplanning or Wet Runway	.113	.067	40,000	.0045	.0027
Thunderstorms	.029	.017	21,000	.0007	.0004

1/From Figure 25.
2/Figure 26 divided by Figure 25, rounded to nearest thousand.

and landing phases of operation, the avertable accident rates in Figure 27 are derived in per operation terms. Denomination in these terms will facilitate application of the criteria developed in this report since aircraft activity statistics are counted and published in such terms. The "per operation" safety benefits derived in Figure 27 are applicable to both the Phase I and Phase II benefit/cost screening processes, except for avertable accidents related to low ceiling/visibility in Phase II. Benefits of avertable low ceiling/visibility accidents will be computed in Phase II using site-specific data. If site-specific data are not available, the Phase II process will use the Phase I benefit.

3. Efficiency Benefits

a. Introduction

Efficiency benefits accrue to each user class at non-towered and non-federal towered airports as the result of implementing AWOS. Commercial air carrier and air taxi operators who operate and maintain Supplementary Aviation Weather Reporting Stations (SAWRS) realize cost avoidance benefits as a result of AWOS replacing the need for SAWRS. The general aviation and military user classes benefit from the reduced risk and incidence of instrument and visual flight disruptions, thus enhancing accessibility of the airport. These benefits are developed in Section 3b for the air carrier and air taxi user classes, Section 3c for the general aviation user class, and in Section 3d for the military user class.

b. Air Carrier and Air Taxi

Approaches to airports in instrument weather conditions are governed by FAR Part 91 for all operators, Part 121 for air carrier operators and Part 135 for air taxi and other commercial operators. These regulations require an approved weather observation service for commercial instrument flight operations. Private operators can still use the airport without a weather observation service operating, but, as discussed later in this section, delays, cancellations, and diversions can result. For the air carrier and air taxi user classes, three alternative approaches were considered for deriving the benefits of avertable flight disruptions afforded by a weather observing system:

- When an FAR Part 121 or 135 operator desires to serve an airport for which neither the FAA or the NWS have regular weather observations, the operator must resort to a self-operated Supplementary Aviation Weather Reporting Station (SAWRS). Therefore, one approach to assessing the benefits of AWOS to such operators is by reference to the avoided costs of operating a SAWRS. This approach is discussed below in further detail.

- The second approach considered is based on the avoidance of costs of diversions to an alternate airport. When weather conditions at an airport receiving scheduled service are such that schedules cannot be met, air carriers often provide ground transportation from an alternate airport which is open, or reimburse passengers for meals and lodging until the destination is accessible. This practice is most common during periods when weather falls below instrument minima. This approach assumes a benefit from avoiding these costs--the value of passengers' time plus whatever aircraft operating costs that are incurred to divert to the alternate airport. Picture, for example, an airport with visual minima of 1500 feet (ceiling) and 3 miles (visibility) and instrument minima of 600 feet and 1 mile. Figure 24, in the preceding section of this chapter, suggests that weather less than visual minima can be expected to prevail on average approximately 13.5 percent of the time and less than instrument minima approximately 4.1 percent of the time. The difference, or 9.4 percent, is the relative time that a Part 121 or 135 operator would be prohibited from serving this airport without the availability of a weather observation service. Since the costs associated with diversions are likely to be much greater than the operator's annualized cost of operating and maintaining a SAWRS, this approach was rejected.

- The third approach assumes that in the absence of an observing capability, an operator would simply elect not to operate out of the airport. Air passengers tend to make personal or business plans which are not disrupted if the air service is unexpectedly denied them, and may not use a service at all if flights are possible only in visual conditions. Since it is not possible to put a dollar value on denial of service, this approach was rejected.

The avoided cost to an operator taking its own weather observations appears to be the most viable and encompassing approach to quantifying the benefits of AWOS to air carrier and air taxi operators. Figure 28 derives an annualized estimate of this avoided cost of $9,548. A comparison of the 1981 inventory of SAWRS stations at airports in the fifty United States, Puerto Rico and the Virgin Islands (Reference 30) and their respective air carrier and air taxi operations from the Terminal Area Forecasts (Reference 26) suggests that the typical SAWRS station has 3,000 or more annual air carrier and air taxi operations (i.e., the sum of annual air carrier and air taxi operations is generally 3,000 or more). Therefore, it can be generally said that such airports generally have SAWRS operators which would benefit from the installation of an AWOS.

An argument can also be made for attributing efficiency benefits to the air carrier and air taxi user classes at non-towered and non-federal towered airports without a SAWRS operation on site. Implementation of AWOS at these airports may attract commercial operators over time and induce others to expand, resulting in greater utilization of the airport and potentially enhancing community and regional economic growth by drawing new businesses to the area and enhancing the ability of existing businesses to expand. Many smaller communities, in particular, are dependent upon air transporation to support their economic development. Accordingly, the criteria developed in this report recognize AWOS benefits to commercial operators, either with or without operating a

SAWRS prior to implementing AWOS. The benefits will range from a high of $9,548 (the annualized cost of a SAWRS) to low of zero (where there are no air carrier or air taxi operations). Expressed in relation to a benefit/cost ratio,

$$\frac{\sum_{n=1}^{15}\left(\frac{\text{Lesser of ((ACITN + ATITN) or (3,000))}}{3{,}000} \times \frac{\$9{,}548}{(1+i)^{n-.5}}\right)}{\text{LCC}}$$

where 'n' is each year of an assumed economic life of 15 years, ACITN and ATITN are the annual numbers of air carrier and air taxi operations, 3,000 is the activity level at or above which characterizes airports with SAWRS, $9,548 is the annualized cost of a SAWRS, 'i' is the OMB-prescribed discount rate of 10 percent and LCC is the life-cycle cost of AWOS. Note that the value of 3,000 limits the benefits to $9,548 annually.

FIGURE 28

Annualized SAWRS Operations, Maintenance and Capital Recovery Costs Allocable to Weather Observation Function (1981 Dollars)

Facilities and Equipment Costs		
Equipment1/	$ 1,900	
Initial Spares1/	+ 475	
Total	$ 2,375	
Life-Cycle Capital Recovery Factor2/	x.13147	$ 312
Operations and Maintenance Costs1/		
Personnel		
Observation3/	$ 7,056	
Maintenance	216	
Spares Inventory	228	
Communications	0	
Facilities	1,736	9,236
Annualized Cost		$9,548

1/From Figure 16.

2/Capital recovery for a uniform series with present value of $1: $i(1+i)^n/((1+i)^n-1)$. Applying a 10 percent interest factor (i) and a 15 year economic life (n) yields 0.13147.

3/SAWRS are assumed to operate 8 hours daily.

c. General Aviation

Part c(1) of this section addresses benefits of avertable flight disruptions of general aviation instrument flights. Part c(2) addresses benefits of avertable flight disruptions of general aviation visual flights.

(1) Instrument Flights

(a) Introduction

Flight disruptions to general aviation instrument flights are comprised of delays, diversions and cancellations. Reducing the risk and incidence of such flight disruptions can be realized through lowered minima requirements allowed with the availability of an on-site altimeter setting source. Delay and diversion benefits are evaluated in this analysis from the perspective of the pilot receiving information from an AWOS while airborne. It is assumed that without the weather observation, the pilot would be unable to descend low enough to see the runway and would be delayed or would fly to an alternate airport. Cancellation benefits are evaluated from the perspective of arrival flights at destination which otherwise would be cancelled if the destination airport doesn't have a weather observing capability.

(b) Benefit of Lowered Minima

As described in the previous section, each instrument approach procedure specifies a minimum altitude to which a pilot may descend, called the "decision height" (DH) or the "minimum descent altitude" (MDA). The basic criteria for setting landing minima are contained in the third edition of the United States Standard for Terminal Instrument Procedures (TERPS), Handbook 8260.3B (Reference 6). The minimum altitude of approach procedures is increased in relation to the distance from the remote altimeter setting source to account for potential differences in barometric pressure. According to TERPS, paragraph 323b, when the altimeter setting is derived from a source further than 5 miles from the runway threshold, the minima are increased by 5 feet for each mile in excess of five miles.

Until 1976, the use of remote altimeter settings had been authorized by FAA regardless of the terrain between the runway and the remote altimeter setting source. However, Notice N 8260.24 (Reference 5) changed this by prohibiting the use of remote altimeter settings at airports in precipitous terrain. In precipitous terrain or where reasonably homogeneous weather characteristics cannot be determined, the notice requires the DH to be raised 10 feet for each mile the altimeter setting is distant from the runway threshold. An MDA is increased with the same rule, or to 1,500 feet, whichever is greater. The altimeter setting must be no more distant than 50 miles.

Of 1,733 airports currently with approved standard instrument approach procedures, IFR approches by Part 91 operators at 1,307 (or approximately 75 percent) of these locations are conducted with altitude information derived from a remote service (Reference 4). Full time remote altimeter setting are required at approximately 931 (54 percent) airports (Reference 4).

The annual benefits to general aviation instrument flights of avoiding flight disruptions because weather observations are available can be expressed as:

$$AB_{AIFD} = AN_{AIFD} \times C_{IFD}$$

where, for avoidable instrument flight disruptions, AB_{AIFD} is the annual benefit, AN_{AIFD} is the annual number, and C_{IFD} is the avoided unit cost.

The annual number of instrument flight disruptions avoided (AN_{AIFD}) can be approximated by the product of the annual number of instrument approaches (AIA_{GA}) and the probability (P_{AIFD}) that a weather observation system would allow the flight to land instead of being disrupted. Through substitution the formula becomes:

$$AB_{AIFD} = AIA_{GA} \times P_{AIFD} \times C_{IFD}$$

The following paragraphs explain the derivation of values for each of the factors in the above formula.

(i) Annual Instrument Approaches (AIA_{GA}):

An instrument approach is an approach made to an airport by an aircraft on an IFR flight plan when the visibility is less than 3 miles or the ceiling is at or below the minimum initial approach altitude.

As explained in the previous section, reported AIA's at less active airports are often inaccurate. As in the previous section, this section relies on a regression model by Systems Control, Inc. (Reference 28) for computing AIA_{GA} in lieu of relying on reported AIA's:

$$AIA_{GA} = \frac{GAITN}{2} \times (P_{IFR} - P_C) \times (.8 - .5R)$$

where

GAITN is the number of annual general aviation itinerant operations,
P_{IFR} is the probability of weather below VFR minima (which is assumed here to be weather in which the visibility is 3 miles or less and/or the ceiling is at or below the minimum initial approach altitude),
P_C is the probability of weather below IFR minima, and
R is the ratio of general aviation operations to total operations.

The divisor in the first term reflects the assumption that half of operations are landings. The second term ($P_{IFR} - P_C$) measures the portion of time that an instrument approach is necessary and can be completed. Accurate determination of this term depends on site specific values of P_{IFR} and P_C. For a national average, more than 1,000 instrument approach plates were examined and it was determined that the nonprecision approach ceiling minimum for general aviation aircraft is 700 without and 600 with an approved altimeter setting source. The frequency of instrument weather below these ceilings can be obtained from Figure 24 in the previous section of this chapter. A 700 foot ceiling and visibility of 1 mile yields a value of 4.95 percent for P_C and the VFR minimum ceiling of 1500 feet and visibility of 3 miles yields a value of 13.50 percent for P_{IFR}. The third term (.8 - 5R) tends to reflect what fraction of flights have pilots qualified and aircraft equipped to make instrument approaches.

Using national average values for PIFR, PC and R, AIA_{GA} can be solved as follows:

$$AIA_{GA} = (GAITN/2) \times (.1350 - .0495) \times (.8 - .5\ (.85))$$

$$= .0160 \times GAITN$$

Note that if a candidate site doesn't have an approved instrument approach procedure (SIAP), AIA_{GA} would by definition be equal to zero because P_C would equal P_{IFP}. As indicated above, many locations cannot utilize a remote altimeter setting source and are therefore restricted from having instrument approaches. In those instances where the lack of an on-site altimeter setting source is the sole reason for the absence of an SIAP, the introduction of AWOS with an altimeter sensor could lead to approval of instrument procedures. Therefore, benefits of avertable flight disruptions will apply only to locations with actual or "would-be" standard instrument approach procedures.

The Phase I criteria developed in this report for publication in Airway Planning Standard Number One (Reference 1) are based on national average values for P_{IFR}, P_C and R. The Phase II benefit/cost computer screening program, however, allows site-specific values for these variables. If site-specific values are not available, national averages will be used as default values.

(ii) <u>Probability of Averting a Disruption</u> (P_{AIFD})

The probability of avoiding an instrument flight disruption (P_{AIFD}) because an AWOS installation has eliminated the remote altimeter setting penalty and lowered minima requirements can be approximated by the relative increase in the percentage of time the airport is above minima for instrument approaches. Using average ceiling minima of 600 feet and 700 feet respectively for instrument approaches with and without an approved altimeter setting source, based on the survey mentioned above, P_{AIFD} can be expressed as:

$$P_{AIFD} = \frac{(\text{Probability of WX LT 700/1}) - (\text{Probability of WX LT 600/1})}{(\text{Probability of WX LT 1500/3}) - (\text{Probability of WX LT 700/1})}$$

Substituting the values from Figure 24 yields:

$$P_{AIFD} = \frac{4.95\% - 4.10\%}{13.50\% - 4.95\%}$$

$$= \frac{0.85\%}{8.55\%}$$

$$= .10$$

In other words, since the availability of weather observations can be expected to reduce average minima from 700/1 to 600/1, one can expect an increase of 10% in airport utilization during instrument weather conditions and a corresponding 10% decrease in instrument flight disruptions.

(iii) Unit Cost of a Disruption (C_{IFD})

An FAA-APO-230 document entitled "Benefits of Reduced Flight Disruption" (Reference 31) standarizes the costs of flight disruptions by user class. For general aviation, Reference 31 provides the following:

	Cost Equation	Weight
Delay	$(0.5\ V_{PT})n + 0.30\ AOC_4$	0.38
Cancellation	$2\ V_{PT}\ n$	0.55
Diversion	$(2.0\ V_{PT} + V_{DVG})n + 1.5\ AOC_4$	0.07
		1.00

where V_{PT} is the hourly value of passengers'/occupants' time, n is the average number of deplaning passengers/occupants from a general aviation flight, AOC_4 is general aviation aircraft variable operating cost per airborne hour, and V_{DVG} is general aviation passenger handling expenses for diverted passengers. Appendix B derives values for V_{PT} and AOC_4 of $19.00 and $84.00 respectively (1981 dollars). Reference 31 provides values for n and V_{DVG} of 2.4 and $53 respectively (1981 dollars). Substituting,

Delay	$ 48.00 x 0.38 =	18.24
Cancellation	$ 91.20 x 0.55 =	50.16
Diversion	$344.40 x 0.07 =	24.11
		$92.51, or $93.00

(c) Summary

The formula for determining the annual benefits to general aviation instrument flights of avoiding flight disruptions because a weather observing system has eliminated the remote altimeter setting penalty and lowered minima requirements can be summarized as:

$$
\begin{aligned}
AB_{AIFD} &= AN_{AIFD} \times C_{IFD} \\
&= AIA_{GA} \times P_{AIFD} \times C_{IFD} \\
&= .0160 \times GAITN \times .10 \times \$93 \\
&= GAITN \times \$.1488
\end{aligned}
$$

(2) Visual Flights

(a) Introduction

In addition to benefiting flights approaching an airport in instrument weather conditions, a weather observing system benefits approaching flights in visual conditions as well. In visual conditions it is assumed that a pilot can see the airport and the ground from at least a distance equal to the basic VFR visibility of one mile. The ceiling and visibility data of the observation are not likely to result in avoiding any disruption to the flight. However, the foreknowledge of wind information could in some cases avoid the need to fly over the airport to determine preferred landing direction. The following paragraphs outline the assumptions and methodology used to compute this delay benefit.

(b) Benefit of Avoided Overflights

An equation similar to that used to compute the benefit of avoided instrument flight disruptions is used to determine the benefit of avoided overflights:

$$AB_{AO} = AN_{AO} \times C_{AO}$$

where, for avoidable overflights, AB_{AO} is the annual benefit, AN_{AO} is the annual number, and C_{AO} is the avoided unit cost.

The annual number of itinerant overflights avoided (AN_{AO}) can be approximated by the product of the annual number of general aviation itinerant operations (GAITN), the fraction of those that are arrivals (F_A), the fraction of those that are conducted in visual conditions (F_{VC}), and the fraction of those that can be expected to overfly in the absence of a weather observation (F_O). Through substitution the formula becomes:

$$AB_{AO} = GAITN \times F_A \times F_{VC} \times F_O \times C_{AO}$$

The following paragraphs explain the derivation of values for each of the unknown factors in the above formula and derives a solution.

(i) Fraction of Total General Aviation Itinerant Operations that are Arrivals (F_{IA}):

It is assumed that half of itinerant operations are arrivals.

(ii) Fraction of General Aviation Itinerant Arrivals Conducted in Visual Conditions (F_{VC}):

Applying national average values of .1350, .0495 and .85 for P_{IFR}, P_C and R respectively to the SCI model discussed earlier suggests that approximately 3.2 percent (.0160 x 2) of general aviation itinerant arrivals are conducted in instrument conditions. Conversely, the fraction of general aviation itinerant arrivals that are conducted in visual conditions (F_{VC}) is 1.0 less .032, or 0.968.

(iii) Fraction of General Aviation VFR Itinerant Arrivals that can be Expected to Overfly in the Absence of a Weather Observation (F_O)

It is postulated that pilots need to overfly the airport to determine landing direction for some fraction of the total number of approaches to the airport (F_O). Ignoring intersecting runways, the fraction was reduced in the following way. First, it is assumed that a pilot approaching an airport when the wind is equal to or greater than 15 knots will have some other way of determining the landing direction--either by non-aviation visual indications (e.g., smoke), by weather conditions at a nearby airport, or by the pilot's knowledge of the synoptic situation. For a sample of 24 airports, Reference 32 indicates that the wind is equal to or greater than 15 knots an average of 11 percent of the time.

Second, it is assumed that the pilot can call the Unicom or other aircraft operating in the airport area to determine the landing direction 70 percent of all arrivals. For the other 30 percent of all arrivals, it is assumed that the Unicom is not operating and that no other aircraft could be contacted. This assumption rests on the fact that the relatively busier non-towered airports are the most likely non-towered airports to qualify for AWOS and that these airports are likely to have Unicom and/or aircraft operating in the airport vicinity which could provide the information to the itinerant pilot.

Finally, it is assumed that if the wind is less than 5 knots, and if the pilot has a weather observation system report of that but no contact with Unicom or other aircraft operating at the airport, the pilot would need to overfly the airport anyway, because either landing direction could be used and the pilot would want to observe local conditions which could not be reported by the equipment, or other traffic and preferred direction due to obstructions, terrain, etc. Again from Reference 32, the wind is less than or equal to 5 knots 24 percent of the time.

The fraction of avoidable itinerant overflights is therefore the product of the percentage of time the wind is equal to or greater than 5 and less than 15 knots, and the time Unicom or another aircraft could not have given the landing direction to the pilot. Summarizing, the fraction of general aviation VFR itinerant arrivals that can be expected to overfly in the absence of a weather observation (F_O) is:

$$F_O = (1.00 - 0.11 - .24) \times 0.30$$

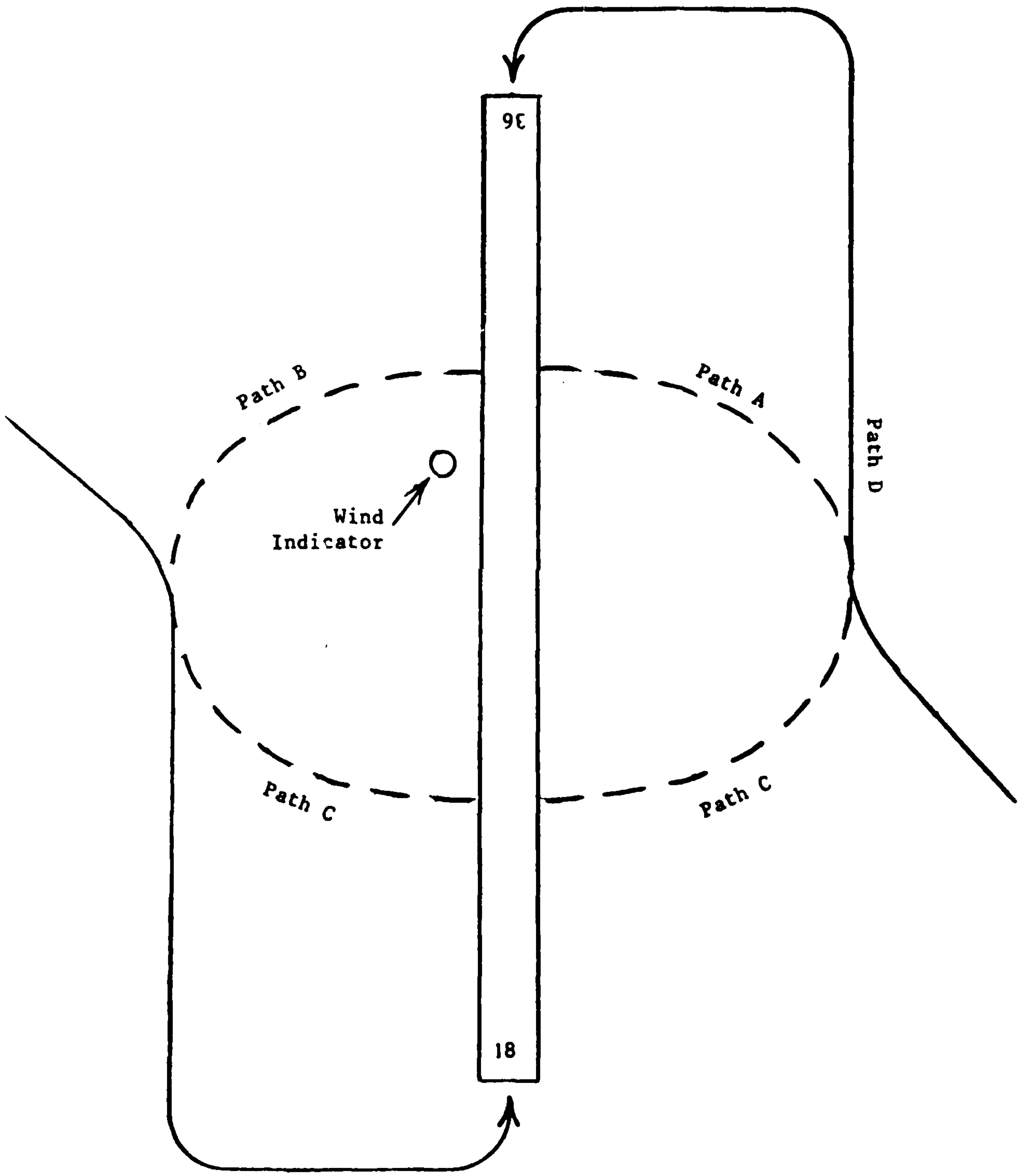
$$= 0.195$$

(iv) Unit Cost of a Disruption (C_{AO})

Figure 29 illustrates a typical one-runway airport with a traffic pattern as recommended in Paragraph 223 of the *Airman's Information Manual* (Reference [illegible]). It is assumed that an aircraft, approaching to land in the absence of a wind advisory, will fly over the airport to view the wind indicator, as shown on Path A. If the pilot finds that Runway 18 is appropriate for the wind direction shown, no extra flight is required to

FIGURE 29

Typical One-Runway Airport



continue along Path B. If the wind indicates that Runway 36 is preferred, the pilot would have to fly along Path C to land on Runway 36. If he had prior knowledge of the landing direction, he could simply fly Path D. It is estimated that the added time in using Path C results in one extra minute of flying time and that the pilot would arrive from the side of the airport which would necessitate Path C 50 percent of the time. An average of 30 seconds per arrival applied to the weighted general aviation hourly operating cost of $84.00 from Appendix B (including aircraft variable operating costs and the value of occupants' time of all general aviation aircraft other than turbojets/fans), yields $.70 as the unit cost of an overflight.

(c) <u>Summary</u>

The formula for determining the annual benefits to general aviation itinerant visual approaches of avoiding overflights can now be solved:

$$AB_{AO} = AN_{AO} \times C_{AO}$$

$$= GAITN \times F_A \times F_{VC} \times F_O \times C_{AO}$$

$$= GAITN \times 0.50 \times 0.968 \times 0.195 \times \$.70$$

$$= GAITN \times \$.0661$$

As in the analysis of AWOS safety benefits discussed earlier in Section C-2-b of this chapter, local approaches are likely to benefit from AWOS as well as itinerant approaches, although to a lesser extent. Pilots in many local approaches, such as local practice approaches and touch-and-go's, are likely to have some foreknowledge of prevailing winds and preferred landing direction. Based on the logic used in Section C-2-b, the benefits to local operations are accorded 60 percent of those for itinerant operations. Applying these logic, the annual benefits to general aviation visual approaches per local and itinerant operation become:

$.0661 per GAITN, and
$.0397 per GALCL

d. <u>Military</u>

Because the characteristics of military aircraft which use civil non-towered and non-federal towered airports are reasonably akin to those of general aviation aircraft (at least within the accuracy of this analysis), the benefits of reduced flight disruptions derived in this chapter for the general aviation user class are also ascribed to the military user class. As with reported counts of annual instrument approaches (AIA's) of general aviation aircraft at non-towered airports, reported AIA's of military aircraft may also be questionable. To guard against this possibility, benefits attributable to reduced military instrument flight disruptions are also denominated in per itinerant operation terms and will apply only to those candidate sites with existing standard instrument approach procedures (SIAP's) or potential SIAP's as the result of installing AWOS.

4. Proximity Penalty and Remoteness Premium

a. Proximity Penalty

Other things being equal, the introduction of an AWOS at an airport which is relatively distant from a surface weather observing station is more beneficial than the introduction of one at an airport which is located relatively close to a surface weather observation station. For example, assume 100 miles separates Airport A from the nearest weather observation station, Site B. Further assume that only 5 miles separates Airport X from its nearest weather observation station, Site Y. Other things being equal, one would expect the actual benefits of a weather observing system at Airport A to exceed those at Airport X.

To compensate for this proximity function and to enhance the ability of the criteria developed in the report to identify the most observing candidate sites for AWOS, a "proximity penalty" is established. Under this provision, the safety and flight disruption benefits of a proposed non-towered or non-federal towered candidate airport for AWOS may be limited depending upon its proximity to neighboring surface weather observation stations. It is postulated that a non-towered or non-federal towered candidate airport for AWOS that is located less than 10 nautical miles from a full-time, non-automated FAA/NWS/NWS Contract surface weather observation station should be credited with only 50 percent of its computed safety and efficiency benefits, except in instances of precipitous terrain or non-homogeneous weather. Conversely, any candidate non-towered or non-federal towered airport that is 10 or more nautical miles from the nearest full-time non-automated surface weather observation station, or whose weather is non-homogeneous with that weather observation station, or which is located in precipitous terrain, should be given full credit for its computed safety and efficiency benefits.

b. Remoteness Premium

In contrast to the proximity penalty, an airport far removed from the nearest surface weather observation station will be credited with a premium in consideration of its remoteness. Provision of surface weather observations at remote locations previously without such service benefits not only aviation users but also nonaviation users since society benefits from an enhanced regional and national synoptic weather forecasting capability. It is postulated that a non-towered or non-federal towered candidate airport for AWOS that is located more distant than the current national average distance between FAA/NWS weather observation stations, or 90 miles as derived below, from the nearest full-time, non-automated FAA/NWS/NWS Contract surface weather observation station should be given a premium mark-up of 25 percent on its computed safety and efficiency benefits. In addition to this AWOS remoteness penalty, certain very remote locations may receive still more compensation for their remoteness through the remoteness compensation provisions in Airway Planning Standard Number One (Reference 1) and Remoteness-Compensation Methodology For Benefit/Cost Establishment and Discontinuance Criteria (Reference 34). These latter references provide benefit-enhancement premiums for a very few sites where relatively large numbers of citizens are without alternative transportation links to the outside world for extended periods of time. Figure 30 derives 6,456 square miles as the national average geographic area covered per FAA and NWS weather observation station. The average distance between observation stations may be approximated by solving for the diameter of a circle representing 6,456 square miles or twice the radius:

$$\pi r^2 = 6,456 \text{ square miles}$$

$$r^2 = 6,456/3.14$$

$$r = 45.34$$

$$2r = 90.68$$

FIGURE 30

Area Covered Per FAA/NWS Weather Observation Station

FAA Region	Square Miles[1]	Number of Stations[2] ATCT FAA	ATCT NWS	FSS FAA	FSS NWS	Total	Square Miles Per Station
Alaskan (AAL)	589,757	2	4	17	7	30	19,659
Central (ACE)	285,467	7	11	18	3	39	7,320
Eastern (AEA)	180,444	12	23	23	4	62	2,910
Great Lakes (AGL)	480,063	29	29	28	4	90	5,334
New England (ANE)	66,608	14	4	5	1	24	2,775
Northwest Mountain (ANM)	682,945	14	21	30	1	66	10,348
Southern (ASO)	386,609	24	33	36	1	94	4,113
Southwest (ASW)	560,550	22	22	33	2	79	7,096
Western-Pacific (AWP)	389,592	37	13	26	1	77	5,060
Total	3,622,035	161	160	216	24	561	6,456

1/Includes continental United States, Alaska, Hawaii, Puerto Rico, and Virgin Islands. Excludes South Pacific and Canal Zone. Source: Reference 35.

2/Source: Reference 2.

5. Summary

Figure 31 summarizes the expected annual quantified benefits of AWOS per aviation activity unit, as derived in this chapter.

FIGURE 31

Summary of Expected Annual Benefits of AWOS at Non-Towered and Non-Federal Towered Airports Per Aviation Activity Unit

Nature of Benefit	Required Sensor	Benefit Per Aviation Activity Unit By User Class		
		Air Carrier and Air Taxi	General Aviation and Military	
			Per Itin. Opn.	Per Local Opn.
Safety (Prevented Accidents By Weather Phenomenon)				
Unfavorable Winds and Wrong Runway	Wind		$ .1963	$ .1178
Temperature/Dew Point	Temperature/Dew Point		$ .0025	$ .0015
Low Ceiling/Visibility	Ceiling/Visibility		$1.064 1/	-
Rain, Hydroplaning, Wet Runway	Precipitation		$ .0045	$ .0027
Thunderstorms	Thunderstorm		$ .0007	$ .0004
Efficiency				
Avoidance of SAWRS Costs		$9,548/Number of AC + AT Operations		
Reduced Disruptions to Instrument Flights	Altimeter		$ .1488 1/	-
Reduced Disruptions to Visual Flights	Wind		$ .0661	$ .0397
Total Direct Benefits		Sum of Applicable Benefits x Adjustment Reciprocal 2/		

1/Applies only to locations with actual or "would-be" standard instrument approach procedures.

2/Adjusting Penalty or Premium Reciprocals:

a. Proximity Penalty Reciprocal = .50. Applies to candidate airports located in non-precipitous terrain and less than 10 nautical miles from a full-time, non-automated surface weather observation station operated by the FAA, the NWS or under NWS contract when both locations have homogeneous weather.

b. Remoteness Premium Reciprocal = 1.25. Applies to candidate airports that are located 90 or more nautical miles from the nearest full-time, non-automated FAA/NWS/NWS contract surface weather observation station.

c. Adjustment reciprocal for all other candidate airports = 1.

D. Indirect Benefits

1. Introduction

In addition to the direct benefits of AWOS addressed up to this point--safety benefits and efficiency benefits--there remain a number of other important benefits which are termed "indirect" or "intangible" benefits in this report. These benefits include safer and more efficient route selection, improved quality of weather information, contribution to the weather communications network, benefits to departing and enroute aircraft, congestion relief at major airports and accident investigation. Attribution of these benefits to specific sites is questionable. Therefore, they are considered in this report qualitatively rather than in quantitative terms.

2. Nature of Indirect Benefits

a. Benefits to Departing and Enroute Aircraft. Sections C-2 and C-3 earlier in this chapter address the safety and efficiency benefits that can be expected to accrue to approaching aircraft at non-towered and non-federal towered airports as a result of an operating AWOS. In addition to approaching aircraft, AWOS may benefit departing and enroute aircraft as well. Although departing pilots should generally have adequate knowledge of prevailing weather at the departure airport, the availability of weather observation data enhances the ability of a pilot to plan for and execute the safest and most efficient route, weather-wise. But as with the other indirect benefits described in this section, these benefits are not easily evaluated with respect to criteria application. Enroute benefits, especially, are difficult, if not impossible, to ascribe site-specifically.

b. Improved Quality of Weather Information. AWOS, as compared with manual weather observing systems, can be expected to improve the quality of weather information. Weather information gathered and disseminated by a manual weather observation site, because of its labor intensive nature, may be unavailable if the observing site is closed, be aged depending on the frequency of observations, and be subject to variances in consistency. AWOS, on the other hand, is capable of providing continuously available, real time and consistent observations.

c. Contribution to the Weather Communications Network. Any addition to the weather communications network benefits not only aviation users but also non-aviation users since society benefits from an enhanced regional and national synoptic weather forecasting capability.

d. Reduced Workload of Flight Service Stations. The demand for services being levied on flight service stations (FSS's) is great and is forecast to increase over the next several years. A study of the FSS system under the joint auspices of the FAA and the Department of Defense (Reference 36) indicates that further accelerated demands on the presently constituted system could result in an unacceptable deterioration in the quality and quantity of FSS services. This condition is one of several which has led to planning for future automation of the FSS network. It will be several years, however, until the network is fully automated. In the interim, implementation of AWOS will reduce the workload burden of FSS's. As indicated in several other parts of this report, locations with an automated flight service station which is obligated to take weather observations automatically qualify for AWOS establishment. Other FSS locations qualify if they satisfy the benefit/cost-based criteria developed in the report and published in Airway Planning Standard Number One (Reference 1).

e. Congestion Relief at Major Airports. Airspace capacity problems exist today at several U.S. airports, primarily in the busy hub areas. Terminal airspace capacity is limited by the physical layout of many airports and by the ability of the air traffic control system to meter and space aircraft for safe operations. The expanded use of satellite or reliever airports in metropolitan areas is one of several alternatives often considered as an efficient method of relieving increasing traffic congestion at primary air terminals. Significant diversions of traffic to satellite airports are hindered, however, by the lack of incentives to draw traffic away from the primary terminals. Provision of weather observing systems at satellite airports is thought to provide some incentive to attract aircraft away from primary terminals in two ways. First, as discussed in other sections of this chapter, FAR Parts 121 (for air carrier operators) and 135 (for air taxi operators) prohibit instrument operations at airports which do not have approved weather observation services. Implementation of AWOS at a satellite airport previously without a weather observation service, therefore, would at least open and hopefully attract commercial operators to the airport. Second, private general aviation pilots may be attracted to satellite airports if they can be provided with adequate weather information. Other things being equal, they may be induced to minimize the risk of delay associated with many hub airports by utilizing satellite airports.

f. Accident Investigation. Since AWOS is capable of storing and retrieving weather information, benefits may potentially accrue to aircraft accident investigations.

CHAPTER V - DEVELOPMENT OF PHASE I CRITERIA FOR NON-TOWERED AND NON-FEDERAL TOWERED AIRPORTS

In this chapter, Phase I screening criteria for non-towered and non-federal towered airports are derived for incorporation in Airway Planning Standard Number One (Reference 1). Phase I criteria are generalized criteria designed to initially identify potential candidates. These criteria are easily applied with available data and without the aid of a computer. Phase II is a site-specific computerized benefit/cost screening process against which candidates identified under Phase I are further evaluated. Figures 34-A and 34-B of Chapter VI provide computer-generated Phase I and II benefit/cost ratios (before proximity penalty or remoteness premium, if any) for over 3,100 non-towered, non-federal towered and FAA tower discontinuance candidate civil airports in the Terminal Area Forecast Data System.

AWOS may be tailored to meet site-specific needs. For example, at a particular site, certain weather sensors, certain output media, the telephone answering device or long line communications may not be required. In recognition of this possibility, both Phase I and II criteria are developed modularly in this report. In this way, a benefit/cost ratio can be easily computed for any given AWOS configuration. At the date of this report, the typical AWOS configuration is projected by the FAA AWOS Program Office to include sensors for wind direction and speed, temperature, dew point, ceiling, visibility and liquid precipitation. However, future configurations may include additional or fewer sensors. For example, a cloud height (ceiling sensor) may not be justified at certain locations in close proximity to another observation site, while additional sensors, such as for freezing precipitation and thunderstorm, may be added if cost effective.

As explained earlier, many locations cannot utilize a remote altimeter setting source and are therefore restricted from having instrument approaches. Assuming the lack of an on-site altimeter setting source is the sole reason for the absence of an approved standard instrument approach procedure, the introduction of AWOS could lead to the approval of instrument procedures. Therefore, two sets of Phase I criteria are developed in this section: one set for non-towered and non-federal towered airports with existing standard instrument approach procedures or locations currently without instrument approach procedures solely because of the absence of an on-site altimeter setting source, and another set for all other non-towered and non-federal towered airports.

For the air carrier and air taxi user classes, Section C-3-b of Chapter IV derived a range of annual benefits based on a sliding scale ranging from a high of $9,548 (for 3,000 or more annual operations) to a low of zero (where there are no air carrier or air taxi operations). The life-cycle benefits accruing to these user classes can be expressed as:

$$\sum_{n=1}^{15} \left(\frac{\text{Lesser of } ((\text{ACITN} + \text{ATITN}) \text{ or } (3{,}000))}{3{,}000} \times \frac{\$9{,}548}{(1+i)^{n-.5}} \right)$$

where 'n' is each year of an assumed economic life of 15 years, ACITN and ATITN are the respective numbers of annual air carrier and air taxi itinerant operations, 3,000 is the activity level at or above which characterizes locations with SAWRS, and \$.0394 is the quotient of 3,000/(\$9,548 x 7.976). In the later expression 3,000 is the activity break point, \$9,548 is the annualized cost of a SAWRS, and 7.976 is the life-cycle discount factor (present value of a uniform series of \$1: $((1+i)^{n-5}-1)/i(1+i)^{n-5}$ for n = 1 to 15 where 'i' is the OMB-prescribed discount rate of 10 percent and 'n' is each year of an assumed economic life of 15 years).

The Phase I benefit/cost ratio life-cycle equivalent for the general aviation and military user classes is simply the quotient of (1) the product of the total first year benefits, the net discount factor with which first year benefits can be inflated to their life-cycle equivalent, and the proximity penalty or remoteness premium (if any), and (2) the life-cycle cost of the AWOS proposed for the airport in question. These procedures are displayed and summarized in Figures 32 and 33.

It is important that there be a close relationship between the results of Phase I and Phase II. If not, one or both of two undesirable situations can occur. First, locations may show up as candidates under Phase I but fail to reflect an acceptable benefit/cost ratio under Phase II, a situation which is termed "false alarm." Secondly, but more critically, locations may not show up as candidates under Phase I but attain a benefit/cost ratio of 1 or more under Phase II screening, a situation termed "non-identification." In the development of the Phase I establishment criteria, the emphasis was to minimize the non-identification rate but still maintain a reasonable relationship between the benefit/cost ratios derived from both phases.

When an AWOS installation is being considered for discontinuance, initial acquisition and installation costs are irrelevant since they are sunk costs. The only relevant costs are recurring operations and maintenance costs (ignoring salvage costs, relocation costs, etc.). To determine whether a system qualifies for discontinuance, a ratio value is calculated by the applicable approach described above for Phase I establishment criteria. If the ratio value so obtained is less than 0.45, the location satisfies Phase I discontinuance criteria. This figure is an approximation of the level where the remaining life-cycle benefits just offset recurring life-cycle operations and maintenance costs.

FIGURE 32

Methodology for Phase I Establishment Criteria for AWOS at Non-Towered and Non-Federal Towered Airports

User Class	Total First-Year Benefits[1]	Life-Cycle Benefits Inflator		Product or Quotient
Air Carrier and Air Taxi	(Lesser of (ACITN+ATITN) or (3,000)) x $9,548 / 3,000	7.976	=	$xxxx
General Aviation and Military				
Wind Sensor	$ .2624 x (GAITN+MILITN) +$.1575x (GALCL+MILLCL)	14.500	=	$xxxx
Temperature/Dew Point Sensors	$ .0025 x (GAITN+MILITN) +$.0015x (GALCL+MILLCL)	14.500	=	$xxxx
Altimeter Sensor	$ .1488 x (GAITN+MILITN)	14.500	=	$xxxx
Ceiling and Visibility Sensors	$1.0640 x (GAITN+MILITN)	14.500	=	$xxxx
Precipitation Sensor(s)	$ .0045 x (GAITN+MILITN) +$.0027x (GALCL+MILLCL)	14.500	=	$xxxx
Thunderstorm Sensor	$ .0007 x (GAITN+MILITN) +$.0004x (GALCL+MILLCL)	14.500	=	$xxxx

Phase I Value

$$\frac{\text{Sum of Applicable Benefits} \times AR^{2/}}{\text{Life-Cycle Cost From Figure 4}}$$

1/Source: Figure 31

2/Adjustment Reciprocal (AR):

a. Proximity Penalty Reciprocal = .50. Applies to candidate airports located in non-precipitous terrain and less than 10 nautical miles from a full-time, non-automated surface weather observation station operated by the FAA, the NWS or under NWS contract when both locations have homogeneous weather.

b. Remoteness Premium Reciprocal = 1.25. Applies to candidate airports that are located 90 or more nautical miles from the nearest full time, non-automated FAA/NWS/NWS contract surface weather observation station.

c. Adjustment reciprocal for other candidate airports = 1.

FIGURE 33

Phase I Establishment Criteria for AWOS at Non-Towered and Non-Federal Towered Airports

User Class	Airports With Existing Standard Instrument Approach Procedures (SIAP) or With Prospective SIAP With AWOS	Other Non-Towered and Non-Federal Towered Airports	Product
Air Carrier and Air Taxi	Lesser of (ACITN+ATITN) or (3,000) / $.0394	(Lesser of (ACITN+ATITN) or (3,000)) x $25.38	= $xxxx
General Aviation and Military			
Wind Sensor	$ 3.80x (GAITN+MILITN) +$2.28x (GALCL+MILLCL)	$3.80x (GAITN+MILITN) +$2.28x (GALCL+MILLCL)	= $xxxx
Temperature/Dew Point Sensors	$ .04x (GAITN+MILITN) +$ .02x (GALCL+MILLCL)	$ .04x (GAITN+MILITN) +$ .02x (GALCL+MILLCL)	= $xxxx
Altimeter Sensor	$ 2.16x (GAITN+MILITN)	$0.00x (GAITN+MILITN)	= $xxxx
Ceiling/Visibility Sensors	$15.43x (GAITN+MI' ITN)	$0.00x (GAITN+MILITN)	= $xxxx
Precipitation Sensor(s)	$ .06x (GAITN+MILITN) +$ .04x (GALCL+MILLCL)	$ .06x (GAITN+MILITN) +$ .04x (GALCL+MILLCL)	= $xxxx
Thunderstorm Sensor	$ .01x (GAITN+MILITN) +$ .01x (GALCL+MILLCL)	$ .01x (GAITN+MILITN) +$ .01x (GALCL+MILLCL)	= $xxxx

Phase I Value (If 1.0 or greater, location satisfies Phase I establishment criteria.)

$$\frac{\text{Sum of Applicable Benefits x AR}}{\text{Life Cycle Cost From Figure 4}}$$

CHAPTER VI - RESULTS OF APPLYING CRITERIA TO NON-TOWERED AIRPORTS, NON-FEDERAL TOWERED AIRPORTS AND ATCT DISCONTINUANCE CANDIDATES

The computer program described in Appendix C, based on the benefit/cost methodology described in Chapters III, IV-C and V, was used to compute benefit/cost ratios for approximately 3,300 non-towered and non-federal towered civil airports and 50 FAA towered airports tentatively identified as tower discontinuance candidates by Reference 11 based on the Terminal Area Forecasts (TAF) over the 15-year period Fiscal Years 1981 through 1995. The results are outlined in Figures 34-A (for non-towered and non-federal towered civil airports) and 34-B (for tentatively-identified FAA ATCT discontinuance candidates). Locations where surface weather observations are currently provided by or under contract with the National Weather Service are not listed. Figure 34-A is sequenced by Region-State and descending Phase II benefit/cost ratio and Figure 34-B is sequenced by location identifier code. Statistical summaries are provided at the ends of Figures 34-A and 34-B.

Figures 34-A and 34-B presume installation and corresponding life-cycle costs and benefits of AWOS with sensors for wind direction and speed, temperature, dew point, altimeter, ceiling, visibility and liquid precipitation. While this is the typical AWOS configuration envisioned by the AWOS Program Office as of the date of this report, future configurations may include additional or fewer sensors. For example, a cloud height (ceiling) sensor may not be justified at certain locations in close proximity to another observation site, while additional sensors, such as for freezing precipitation and thudnerstorms, may be added if cost effective.

It may be recalled from Chapter IV that while benefits of altimeter, ceiling and visibility sensors are functions of annual instrument approaches (AIA's), they are denominated in per itinerant terms in the criteria because reported AIA counts at many airports are often inaccurate and unreliable. The results in Figures 34-A and 34-B allow for these benefits as a function of itinerant operations only if the TAF reflects a positive value for AIA's. If the AIA fields in the TAF read zero, these benefits are suppressed. This same procedure will apply in actual application of the criteria. In the relatively few instances where the installation of AWOS would lead to the approval of instrument approach procedures where theretofore there were none, this suppresion will not be applied in actual practice.

Finally, Figures 34-A and 34-B do not reflect any proximity penalty or remoteness premium that might be applicable as a result of the airport's proximity to or remoteness from other surface weather observation stations.

FIGURE 34-A

RESULTS OF APPLYING CRITERIA TO NON-TOWERED AND NON-FAA TOWERED CIVIL AIRPORTS

(SITES WHERE NWS CURRENTLY OBSERVES WEATHER ARE EXCLUDED)

REG	LOCID	AIRPORT NAME	CITY	ST	LC SAFETY BENS	LC EFFICY BENS	GA+ML AIA'S YR 1	PHASE I B/C#	PHASE II B/C
ALASKAN REGION									
AAL	OTZ	RALPH WIEN MEMORIAL	KOTZEBUE	AK	1209024.	293728.	1169.	5.29	9.98
AAL	UMT	UMIAT	UMIAT	AK	442469.	179060.	413.	3.61*	4.13*
AAL	ANI	ANIAK	ANIAK	AK	229446.	141113.	233.	1.44	2.46
AAL	TKA	TALKEETNA	TALKEETNA	AK	211891.	116827.	197.	1.84*	2.18*
AAL	SXQ	SOLDOTNA	SOLDOTNA	AK	152541.	155150.	0.	6.03	2.04
AAL	PAQ	PALMER MUNI	PALMER	AK	110327.	141374.	0.	1.56	1.67
AAL	BTT	BETTLES	BETTLES	AK	104053.	139323.	0.	4.64	1.62
AAL	CDV	CORDOVA-MILE 13	CORDOVA	AK	110951.	123518.	141.	0.93	1.56
AAL	DLG	DILLINGHAM	DILLINGHAM	AK	90824.	135002.	0.	4.95	1.50
AAL	Z15	BIRCHWOOD	BIRCHWOOD	AK	99572.	119931.	0.	1.25	1.46
AAL	WSN	SOUTH NAKNEK NR 2	SOUTH NAKNEK	AK	73353.	129304.	0.	1.20	1.35
AAL	5NK	NAKNEK	NAKNEK	AK	68308.	127657.	0.	1.16	1.30
AAL	KTN	KETCHIKAN INTL	KETCHIKAN	AK	71519.	120720.	48.	2.00	1.28
AAL	HOM	HOMER	HOMER	AK	57894.	123776.	1.	2.29	1.21
AAL	SIT	SITKA	SITKA	AK	57198.	123041.	3.	3.15	1.20
AAL	ORT	NORTHWAY	NORTHWAY	AK	52122.	118244.	201.	1.81	1.13
AAL	FWL	FAREWELL	FAREWELL	AK	69152.	92377.	65.	0.74*	1.07*
AAL	PTH	PORT HEIDEN	PORT HEIDEN	AK	43567.	100364.	42.	0.41*	0.96*
AAL	GKN	GULKANA	GULKANA	AK	27050.	114192.	0.	1.55	0.94
AAL	5KE	KETCHIKAN HARBOR	KETCHIKAN	AK	26361.	114066.	0.	0.75	0.94
AAL	MTF	METRO FLD	FAIRBANKS	AK	41641.	94627.	0.	0.67	0.91
AAL	2Z0	EMMONAK	EMMONAK	AK	22164.	112569.	0.	0.72	0.90
AAL	FYU	FORT YUKON	FORT YUKON	AK	22394.	112651.	1.	1.49	0.90
AAL	ILI	ILIAMNA	ILIAMNA	AK	21562.	112402.	0.	0.71	0.89
AAL	GST	GUSTAVUS	GUSTAVUS	AK	42803.	89556.	42.	0.55*	0.88*
AAL	WRG	WRANGELL	WRANGELL	AK	20956.	112202.	0.	1.58	0.88
AAL	PII	PHILLIPS FIELD	FAIRBANKS	AK	19783.	111820.	0.	0.69	0.87
AAL	SWD	SEWARD	SEWARD	AK	15152.	110308.	0.	0.65	0.83
AAL	CKU	CORDOVA MUNI	CORDOVA	AK	12812.	109545.	0.	0.62	0.81
AAL	KDK	KODIAK MUNI	KODIAK	AK	11564.	109139.	0.	0.62	0.80
AAL	KSM	ST MARYS	ANDREAFSKY /ST MARYS/	AK	9043.	108314.	0.	0.91	0.78
AAL	ORV	ROBERT /BOB/ CURTIS MEML	NOORVIK	AK	7959.	107865.	0.	0.58	0.77
AAL	Z16	WASILLA	WASILLA	AK	8031.	107321.	0.	0.56	0.77
AAL	TAL	RALPH M CALHOUN MEML	TANANA	AK	7418.	107784.	0.	0.58	0.77
AAL	5Z2	NORTH DOUGLAS	JUNEAU	AK	8914.	107610.	0.	0.57	0.77
AAL	TSG	TANACROSS	TANACROSS	AK	6660.	107537.	0.	0.57	0.76
AAL	PIP	PILOT POINT	PILOT POINT	AK	9624.	104126.	0.	0.51	0.76
AAL	SOV	SELDOVIA	SELDOVIA	AK	6975.	107640.	0.	0.57	0.76
AAL	ENN	NENANA MUNI	NENANA	AK	8432.	106660.	0.	0.54	0.76
AAL	ARC	ARCTIC VILLAGE	ARCTIC VILLAGE	AK	6121.	107361.	0.	0.56	0.75
AAL	KKA	KOYUK	KOYUK	AK	4380.	106793.	0.	0.55	0.74
AAL	OLH	OLD HARBOR	OLD HARBOR	AK	4088.	106697.	0.	0.54	0.74
AAL	WLK	SELAWIK	SELAWIK	AK	1752.	105935.	0.	0.52	0.72
AAL	PUO	PRUDHOE BAY	PRUDHOE BAY	AK	1728.	105928.	0.	0.52	0.72

AAL	MOS	MOSES POINT	MOSES POINT	AK	2939.	105012.	0.	0.49	0.72
AAL	HSL	HUSLIA	HUSLIA	AK	2337.	106126.	0.	0.53	0.72
AAL	94Z	NOME CITY FIELD	NOME	AK	10235.	97966.	0.	0.44	0.72
AAL	RBY	RUBY	RUBY	AK	5515.	101894.	0.	0.46	0.71
AAL	BKC	BUCKLAND	BUCKLAND	AK	960.	105210.	0.	0.50	0.71
AAL	NUL	NULATO	NULATO	AK	1743.	105683.	0.	0.51	0.71
AAL	AK47	TATITLEK	TATITLEK	AK	2921.	103745.	0.	0.47	0.71
AAL	SHH	SHISHMAREF	SHISHMAREF	AK	3503.	101229.	0.	0.45	0.70
AAL	SVA	SAVOONGA	SAVOONGA	AK	456.	105512.	0.	0.51	0.70
AAL	PTU	PLATINUM	PLATINUM	AK	1857.	102095.	0.	0.44	0.69
AAL	FLT	FLAT	FLAT	AK	5512.	98055.	0.	0.42	0.69
AAL	GAM	GAMBELL	GAMBELL	AK	177.	102820.	0.	0.45	0.68
AAL	TOG	TOGIAK	TOGIAK VILLAGE	AK	6043.	95696.	0.	0.42	0.68
AAL	HPB	HOOPER BAY	HOOPER BAY	AK	1223.	99031.	0.	0.41	0.67
AAL	CLP	CLARKS POINT	CLARKS POINT	AK	3761.	96802.	0.	0.41	0.67
AAL	KWN	KWINHAGAK	QUINHAGAK	AK	1548.	93585.	0.	0.41	0.67
AAL	KEK	EKWOK	EKWOK	AK	2045.	99537.	0.	0.42	0.67
AAL	AK44	TALKEETNA VILLAGE STRIP	TALKEETNA	AK	10413.	89081.	0.	0.39	0.66
AAL	WTK	NOATAK	NOATAK	AK	2151.	97747.	0.	0.41	0.66
AAL	TYE	TYONEK	TYONEK	AK	1760.	96831.	0.	0.39	0.66
AAL	MLL	MARSHALL	MARSHALL	AK	1890.	96857.	0.	0.40	0.66
AAL	ORI	PORT LIONS	PORT LIONS	AK	1460.	98584.	0.	0.42	0.66
AAL	PPC	PROSPECT CREEK	PROSPECT CREEK	AK	13135.	86900.	0.	0.41	0.66
AAL	VEE	VENETIE	VENETIE	AK	1167.	96130.	0.	0.39	0.65
AAL	HUS	HUGHES	HUGHES	AK	1496.	96744.	0.	0.38	0.65
AAL	OOK	TOKSOOK BAY	TOKSOOK BAY	AK	1548.	96186.	0.	0.39	0.65
AAL	AUK	ALAKANUK	ALAKANUK	AK	1958.	95496.	0.	0.40	0.65
AAL	AK61	TUNTUTULIAK	TUNTUTULIAK	AK	1764.	95201.	0.	0.37	0.64
AAL	KYU	KOYUKUK	KOYUKUK	AK	876.	94768.	0.	0.37	0.64
AAL	CHP	CIRCLE HOT SPRINGS	CIRCLE HOT SPRINGS	AK	12009.	84955.	0.	0.35	0.64
AAL	5NI	NIKOLAI	NIKOLAI	AK	291.	96316.	0.	0.37	0.64
AAL	WAA	WALES	WALES	AK	347.	94053.	0.	0.36	0.63
AAL	AKK	AKHIOK	AKHIOK	AK	283.	94707.	0.	0.37	0.63
AAL	GLV	GOLOVIN	GOLOVIN	AK	3309.	90404.	0.	0.36	0.62
AAL	MOU	MOUNTAIN VILLAGE	MOUNTAIN VILLAGE	AK	1772.	91114.	0.	0.38	0.62
AAL	IAN	BOB BAKER MEML	KIANA	AK	5514.	87086.	0.	0.37	0.62
AAL	WMO	WHITE MOUNTAIN	WHITE MOUNTAIN	AK	2967.	90822.	0.	0.36	0.62
AAL	GBH	GALBRAITH LAKE	GALBRAITH LAKE	AK	7298.	84827.	0.	0.67	0.61
AAL	CEM	CENTRAL	CENTRAL	AK	1806.	90092.	0.	0.35	0.61
AAL	DRG	DEERING	DEERING	AK	1337.	88994.	0.	0.37	0.60
AAL	KOT	KOTLIK	KOTLIK	AK	1168.	89268.	0.	0.35	0.60
AAL	BGQ	BIG LAKE STRIP NR 2	BIG LAKE	AK	6455.	83143.	0.	0.34	0.60
AAL	6Z4	KETCHIKAN /TEMSCO H/	KETCHIKAN	AK	2800.	86597.	0.	0.32	0.59
AAL	IGG	IGIUGIG	IGIUGIG	AK	19667.	67434.	0.	0.39	0.58
AAL	GNU	GOODNEWS	GOODNEWS	AK	5838.	81397.	0.	0.34	0.58
AAL	AQY	GIRDWOOD	GIRDWOOD	AK	4065.	82364.	0.	0.32	0.57
AAL	KGX	GRAYLING	GRAYLING	AK	3787.	82119.	0.	0.33	0.57
AAL	AK63	TWIN HILLS	TWIN HILLS	AK	765.	81286.	0.	0.28	0.55
AAL	CRC	CIRCLE CITY	CIRCLE	AK	3787.	79173.	0.	0.31	0.55
AAL	Z09	AKOLMIUT	AKOLMIUT	AK	291.	81132.	0.	0.28	0.54
AAL	8Z9	KIPNUK	KIPNUK	AK	585.	81228.	0.	0.28	0.54
AAL	HNS	HAINES	HAINES	AK	15134.	60658.	0.	0.33	0.50
AAL	SCM	SCAMMON BAY	SCAMMON BAY	AK	876.	72662.	0.	0.27	0.49
AAL	TCT	TAKOTNA	TAKOTNA	AK	3267.	67801.	0.	0.25	0.47
AAL	AET	ALLAKAKET	ALLAKAKET	AK	3040.	67732.	0.	0.25	0.47
AAL	KAL	KALTAG	KALTAG	AK	1337.	67943.	0.	0.27	0.46
AAL	PHO	POINT HOPE	POINT HOPE	AK	1105.	66922.	0.	0.27	0.45
AAL	MLY	MANLEY HOT SPRINGS	MANLEY HOT SPRINGS	AK	1567.	64878.	0.	0.24	0.44
AAL	EEK	EEK	EEK	AK	2045.	63802.	0.	0.24	0.44
AAL	KVL	KIVALINA	KIVALINA	AK	291.	66554.	0.	0.26	0.44

AAL	RDV	RED DEVIL	RED DEVIL	AK	5247.	57431.	0.	0.23	0.42
AAL	AK86	NAPAKIAK	NAPAKIAK	AK	1499.	62139.	0.	0.21	0.42
AAL	ELI	ELIM	ELIM	AK	1460.	58017.	0.	0.22	0.40
AAL	MHM	MINCHUMINA	MINCHUMINA	AK	2921.	3212.	0.	0.40	0.40
AAL	Z10	KONGIGANAK	KONGIGANAK	AK	3503.	55862.	0.	0.22	0.40
AAL	PSG	PETERSBURG	PETERSBURG	AK	1513.	57663.	0.	0.31	0.39
AAL	KLG	KALSKAG	KALSKAG	AK	1567.	57733.	0.	0.25	0.39
AAL	RSH	RUSSIAN MISSION	RUSSIAN MISSION	AK	2508.	54768.	0.	0.22	0.38
AAL	AK85	KWIGILLINGOK	KWIGILLINGOK	AK	1460.	56195.	0.	0.20	0.38
AAL	DCK	DAHL CREEK	DAHL CREEK	AK	585.	55910.	0.	0.19	0.38
AAL	KLL	LEVELOCK	LEVELOCK	AK	2594.	52447.	0.	0.22	0.37
AAL	AK87	NEWTOK	NEWTOK	AK	438.	55862.	0.	0.19	0.37
AAL	LNI	LONELY DEW STATION	LONELY	AK	43417.	11281.	18.	0.33*	0.36*
AAL	KNW	NEW STUYAHOK	NEW STUYAHOK	AK	2045.	48030.	0.	0.21	0.33
AAL	WKK	ALEKNAGIK	ALEKNAGIK	AK	3180.	46961.	0.	0.20	0.33
AAL	BLG	BELUGA	BELUGA	AK	14769.	32704.	0.	0.23	0.32
AAL	SHG	SHUNGNAK	SHUNGNAK	AK	457.	46098.	0.	0.19	0.31
AAL	DUT	DUTCH HARBOR	DUTCH HARBOR	AK	349.	46269.	2.	0.21	0.31
AAL	2Z5	CHENA RIVER	FAIRBANKS	AK	16410.	30015.	0.	0.23	0.31
AAL	SMK	ST MICHAEL	ST MICHAEL	AK	1134.	45550.	0.	0.18	0.31
AAL	SDP	SAND POINT	SAND POINT	AK	2548.	42884.	0.	0.20	0.30
AAL	KGK	NEW KOLIGANEK	NEW KOLIGANEK	AK	1752.	41313.	0.	0.18	0.29
AAL	MDR	MEDFRA	MEDFRA	AK	1451.	42215.	0.	0.15	0.29
AAL	KKU	EKUK	EKUK	AK	2508.	40287.	0.	0.17	0.28
AAL	CDL	CANDLE 2	CANDLE	AK	877.	39988.	0.	0.15	0.27
AAL	Z03	EGEGIK /NEW/	EGEGIK	AK	9372.	30943.	0.	0.18	0.27
AAL	EAA	EAGLE	EAGLE	AK	4885.	35434.	0.	0.17	0.27
AAL	17Z	MANOKOTAK	MANOKOTAK	AK	585.	39142.	0.	0.13	0.26
AAL	PKA	NAPAISKAK	NAPAISKAK	AK	876.	37492.	0.	0.14	0.25
AAL	VAK	CHEVAK	CHEVAK	AK	876.	36070.	0.	0.15	0.25
AAL	95Z	BRADLEY SKY-RANCH	NORTH POLE	AK	4497.	32292.	0.	0.14	0.24
AAL	51Z	MINTO /NEW/	MINTO	AK	6357.	29959.	0.	0.15	0.24
AAL	Z74	CHEFORNAK	CHEFORNAK	AK	1460.	33919.	0.	0.12	0.24
AAL	SKK	SHAKTOOLIK	SHAKTOOLIK	AK	291.	36082.	0.	0.15	0.24
AAL	KEB	ENGLISH BAY	ENGLISH BAY	AK	1896.	34062.	0.	0.13	0.24
AAL	4Z4	HOLY CROSS	HOLY CROSS	AK	462.	33594.	0.	0.12	0.23
AAL	OBU	KOBUK /WIEN/	KOBUK	AK	5247.	29458.	0.	0.15	0.23
AAL	Z60	AMBLER	AMBLER	AK	5515.	29684.	0.	0.14	0.23
AAL	WBQ	BEAVER	BEAVER	AK	1460.	31916.	0.	0.14	0.22
AAL	SVS	STEVENS VILLAGE	STEVENS VILLAGE	AK	1460.	30125.	0.	0.13	0.21
AAL	AIN	WAINWRIGHT DEW STATION	WAINWRIGHT	AK	1776.	29743.	2.	0.13*	0.21*
AAL	CXC	CHITINA	CHITINA	AK	3114.	28901.	0.	0.12	0.21
AAL	AK54	TELLER	TELLER	AK	2508.	28703.	0.	0.12	0.21
AAL	AK04	PEDRO BAY	PEDRO BAY	AK	1607.	28408.	0.	0.11	0.20
AAL	ANV	ANVIK	ANVIK	AK	1806.	28474.	0.	0.11	0.20
AAL	AKP	ANAKTUVUK PASS	ANAKTUVUK PASS	AK	1460.	28363.	0.	0.11	0.20
AAL	5NN	NONDALTON	NONDALTON	AK	2067.	28559.	0.	0.11	0.20
AAL	KFP	FALSE PASS	FALSE PASS	AK	1607.	28408.	0.	0.11	0.20
AAL	KCL	CHIGNIK LAGOON	CHIGNIK FLATS	AK	1630.	28416.	0.	0.11	0.20
AAL	15Z	MCCARTHY NR 2	MCCARTHY	AK	2033.	28548.	0.	0.11	0.20
AAL	TKJ	TOK	TOK	AK	1686.	28435.	0.	0.11	0.20
AAL	CYT	YAKATAGA	YAKATAGA	AK	1633.	28424.	0.	0.11	0.20
AAL	Z46	MEADE RIVER	ATKASUK	AK	89.	27913.	0.	0.09	0.19
AAL	PGM	PORT GRAHAM	PORT GRAHAM	AK	585.	28075.	0.	0.10	0.19
AAL	AK10	PILOT STATION	PILOT STATION	AK	585.	28077.	0.	0.10	0.19
AAL	AK79	CHIGNIK LAKE	CHIGNIK LAKE	AK	620.	28087.	0.	0.10	0.19
AAL	RMP	RAMPART	RAMPART	AK	673.	23666.	0.	0.12	0.19
AAL	SRV	STONY RIVER 2	STONY RIVER	AK	730.	23122.	0.	0.10	0.19
AAL	SLQ	SLEETMUTE	SLEETMUTE	AK	0.	27884.	0.	0.09	0.19
AAL	CIK	CHALKYITSIK	CHALKYITSIK	AK	438.	26674.	0.	0.11	0.18

AAL	KYK	KARLUK	KARLUK	AK	150.	27446.	0.	0.12	0.18
AAL	KWT	KWETHLUK	KWETHLUK	AK	291.	25273.	0.	0.10	0.17
AAL	Z79	CHIGNIK	CHIGNIK	AK	4380.	20940.	0.	0.11	0.17
AAL	[illegible]	PHILOS	WASILLA	AK	4149.	19849.	0.	0.10	0.16
AAL	[illegible]	STEBBINS	STEBBINS	AK	291.	23742.	0.	0.10	0.16
AAL	LST	LOST RIVER 1	LOST RIVER	AK	291.	22341.	0.	0.08	0.15
AAL	5Q[illegible]	THE QUEENS	QUEENS	AK	1607.	17283.	0.	0.07	0.13
AAL	KTS	BREVIG MISSION	TELLER MISSION	AK	150.	18666.	0.	0.08	0.13
AAL	Z38	SKY HARBOR	ANCHORAGE	AK	13331.	4352.	0.	0.12	0.12
AAL	Z41	LAKE HOOD STRIP	ANCHORAGE	AK	11645.	6891.	0.	0.12	0.12
AAL	AK45	TUNUNAK	TANUNAK	AK	876.	17045.	0.	0.06	0.12
AAL	AKI	AKIAK	AKIAK	AK	60.	15057.	0.	0.06	0.10
AAL	MYU	MEKORYUK	MEKORYUK	AK	756.	14973.	0.	0.07	0.10
AAL	Z13	AKIACHAK	AKIACHAK	AK	1047.	14243.	0.	0.06	0.10
AAL	UGA	UGASHIK	UGASHIK	AK	2045.	12222.	0.	0.07	0.09
AAL	SKW	SKWENTNA	SKWENTNA	AK	5501.	8043.	5.	0.04*	0.09*
AAL	KVC	KING COVE	KING COVE	AK	876.	11727.	0.	0.05	0.08
AAL	TLT	TULUKSAK	TULUKSAK	AK	673.	12099.	0.	0.06	0.08
AAL	HAY	HAYCOCK	HAYCOCK	AK	291.	11295.	0.	0.04	0.08
AAL	CKX	CHICKEN	CHICKEN	AK	2594.	9141.	0.	0.05	0.08
AAL	AK14	PORTAGE CREEK	PORTAGE CREEK	AK	876.	11436.	0.	0.05	0.08
AAL	24AK	NIGHTMUTE	NIGHTMUTE	AK	150.	12379.	0.	0.04	0.08
AAL	2AK9	INDEPENDENCE CREEK	INDEPENDENCE CREEK	AK	450.	9403.	0.	0.03	0.07
AAL	HNH	HOONAH	HOONAH	AK	8458.	2760.	0.	0.08	0.07
AAL	WCR	CHANDALAR LAKE	CHANDALAR	AK	3091.	6550.	0.	0.05	0.06
AAL	MYK	MAY CREEK	MAY CREEK	AK	585.	8504.	0.	0.03	0.06
AAL	Z95	COUNCIL (PEDERSON)	COUNCIL	AK	818.	8561.	0.	0.04	0.06
AAL	Z22	WILLOW	WILLOW	AK	3787.	5737.	0.	0.05	0.06
AAL	WSM	WISEMAN	WISEMAN	AK	425.	6824.	0.	0.03	0.05
AAL	ZNC	NYAC	NYAC	AK	89.	6692.	0.	0.02	0.05
AAL	9Z1	KLAWOCK	KLAWOCK	AK	1460.	6017.	0.	0.03	0.05
AAL	5TE	TETLIN	TETLIN	AK	526.	5713.	0.	0.02	0.04
AAL	SHX	SHAGELUK	SHAGELUK	AK	876.	5827.	0.	0.03	0.04
AAL	Z84	CLEAR	CLEAR	AK	4775.	1558.	0.	0.05	0.04
AAL	BYA	BOUNDARY	BOUNDARY	AK	438.	5684.	0.	0.02	0.04
AAL	AK05	PERRYVILLE	PERRYVILLE	AK	585.	5732.	0.	0.02	0.04
AAL	NFV	POINT BARROW	POINT BARROW	AK	1372.	3539.	0.	0.02	0.03
AAL	0Z4	DILLINGHAM CITY STRIP	DILLINGHAM	AK	2998.	978.	0.	0.03	0.03
AAL	5HO	HOPE	HOPE	AK	539.	3267.	0.	0.01	0.03
AAL	PCK	PORCUPINE CREEK	PORCUPINE CREEK	AK	150.	2925.	0.	0.01	0.02
AAL	Z17	OPHIR	OPHIR	AK	44.	2890.	0.	0.01	0.02
AAL	PIZ	POINT LAY DEW STATION	POINT LAY	AK	224.	3285.	1.	0.01	0.02
AAL	CZN	CHISANA	CHISANA	AK	291.	2971.	0.	0.01	0.02
AAL	TPO	TANALIAN POINT	TANALIAN POINT	AK	609.	3074.	0.	0.02	0.02
AAL	OLI	OLIKTOK DEW STATION	OLIKTOK POINT	AK	1180.	210.	0.	0.00	0.01
AAL	AK01	BUTTE MUNICIPAL	PALMER	AK	1593.	520.	0.	0.01	0.01

CENTRAL REGION

ACE	CBF	COUNCIL BLUFFS MUNI	COUNCIL BLUFFS	IA	1093963.	190760.	1082.	7.02*	8.54*
ACE	MCW	MASON CITY MUNI	MASON CITY	IA	991968.	264500.	953.	4.30	8.35
ACE	AMW	AMES MUNI	AMES	IA	937027.	268726.	927.	7.31	8.01
ACE	OTM	OTTUMWA INDUSTRIAL	OTTUMWA	IA	814347.	233856.	785.	3.36	6.96
ACE	BRL	BURLINGTON MUNI	BURLINGTON	IA	694590.	216965.	693.	3.81	6.06
ACE	FOD	FORT DODGE MUNI	FORT DODGE	IA	579880.	199874.	556.	2.76	5.18
ACE	MIW	MARSHALLTOWN MUNI	MARSHALLTOWN	IA	566626.	157029.	745.	3.73	4.81
ACE	SPW	SPENCER MUNI	SPENCER	IA	491987.	186102.	500.	3.20	4.51
ACE	CWI	CLINTON MUNI	CLINTON	IA	404627.	173914.	364.	2.91	3.84

ACE	MUT	MUSCATINE MUNI	MUSCATINE	IA	350985.	96147.	351.	2.54	2.97
ACE	TNU	NEWTON MUNI	NEWTON	IA	329095.	96207.	337.	2.14	2.83
ACE	CAV	CLARION MUNI	CLARION	IA	296638.	89439.	296.	2.07*	2.57*
ACE	CNC	CHARITON MUNI	CHARITON	IA	230042.	69866.	271.	1.89*	2.32*
ACE	ICL	CLARINDA MUNI	CLARINDA	IA	272678.	69164.	275.	1.95*	2.27*
ACE	AXA	ALGONA MUNI	ALGONA	IA	189261.	145121.	143.	1.92	2.22
ACE	IOW	IOWA CITY MUNICIPAL	IOWA CITY	IA	179542.	148547.	651.	3.91	2.18
ACE	SRK	SPIRIT LAKE MUNI	SPIRIT LAKE	IA	188507.	137302.	190.	1.68*	2.16*
ACE	OXV	KNOXVILLE MUNI	KNOXVILLE	IA	227448.	50572.	220.	1.60	1.85
ACE	K27	FORT MADISON MUNI	FORT MADISON	IA	132174.	128165.	131.	1.30*	1.73*
ACE	AIO	ATLANTIC MUNI	ATLANTIC	IA	145551.	105079.	121.	1.56	1.67
ACE	RDK	RED OAK MUNICIPAL	RED OAK	IA	195586.	46647.	178.	2.06	1.61
ACE	EBS	WEBSTER CITY MUNI	WEBSTER CITY	IA	180943.	61610.	182.	1.23	1.61
ACE	BNW	BOONE MUNI	BOONE	IA	175311.	64656.	157.	2.11	1.59
ACE	SHL	SHELDON MUNI	SHELDON	IA	165485.	73220.	160.	1.24	1.59
ACE	DEH	DECORAH MUNI	DECORAH	IA	145057.	72781.	148.	1.05	1.45
ACE	CCY	CHARLES CITY MUNI	CHARLES CITY	IA	130971.	26947.	126.	0.99	1.45
ACE	C23	MAQUOKETA MUNI	MAQUOKETA	IA	147657.	64538.	141.	1.10*	1.41*
ACE	ADU	AUDUBON MUNI	AUDUBON	IA	89591.	121532.	84.	1.30	1.40
ACE	MXO	MONTICELLO MUNICIPAL	MONTICELLO	IA	157304.	52556.	157.	1.11*	1.39*
ACE	SLB	STORM LAKE MUNI	STORM LAKE	IA	161987.	36789.	154.	1.20	1.32
ACE	EST	ESTHERVILLE MUNI	ESTHERVILLE	IA	137660.	55088.	132.	1.00	1.28
ACE	LRJ	LEMARS MUNI	LEMARS	IA	158809.	32630.	144.	1.66	1.27
ACE	EFW	JEFFERSON MUNI	JEFFERSON	IA	135739.	50718.	123.	1.34	1.24
ACE	ORC	ORANGE CITY MUNI	ORANGE CITY	IA	125467.	53346.	118.	0.99	1.19
ACE	DNS	DENISON MUNI	DENISON	IA	134611.	40414.	122.	1.39	1.16
ACE	POH	POCAHONTAS MUNI	POCAHONTAS	IA	44755.	119971.	0.	2.18	1.09
ACE	IDG	IDA GROVE MUNI	IDA GROVE	IA	68060.	67615.	69.	0.69*	1.03*
ACE	PRO	PERRY MUNI	PERRY	IA	121820.	32505.	135.	1.06	1.03
ACE	CSQ	CRESTON MUNI	CRESTON	IA	36363.	117232.	0.	1.87	1.02
ACE	EOK	KEOKUK MUNI	KEOKUK	IA	34921.	116761.	0.	0.87	1.01
ACE	MEY	MAPLETON MUNI	MAPLETON	IA	96011.	51802.	86.	1.04	0.98
ACE	CIN	ARTHUR N NEU	CARROLL	IA	29896.	115121.	0.	1.62	0.96
ACE	D34	FOREST CITY MUNI	FOREST CITY	IA	27928.	111688.	0.	1.54	0.93
ACE	EGQ	EMMETSBURG MUNI	EMMETSBURG	IA	33443.	104906.	113.	1.08	0.92
ACE	HNR	HARLAN MUNI	HARLAN	IA	72097.	62041.	241.	1.70	0.89
ACE	C25	WAVERLY MUNI	WAVERLY	IA	54540.	71522.	203.	1.60	0.84
ACE	OK9	OELWEIN MUNI	OELWEIN	IA	90809.	35892.	92.	0.52	0.84
ACE	MPZ	MT PLEASANT MUNI	MT PLEASANT	IA	95617.	27927.	94.	0.66	0.82
ACE	SKI	SAC CITY MUNI	SAC CITY	IA	102281.	17776	95.	0.62*	0.80*
ACE	CRZ	CORNING MUNI	CORNING	IA	101268.	17444.	96.	0.65*	0.79*
ACE	K21	CENTERVILLE MUNI	CENTERVILLE	IA	17221.	100745.	0.	0.55	0.78
ACE	SDA	SHENANDOAH MUNI	SHENANDOAH	IA	82565.	28888.	73.	0.82	0.74
ACE	3Y2	GEORGE L SCOTT MUNI	WEST UNION	IA	72818.	34846.	73.	0.58*	0.72*
ACE	SOY	SIOUX CENTER MUNI	SIOUX CENTER	IA	24059.	78507.	0.	0.49	0.68
ACE	PEA	PELLA MUNI	PELLA	IA	19029.	82363.	0.	0.99	0.67
ACE	K22	CHEROKEE MUNI	CHEROKEE	IA	46087.	49190.	0.	0.57	0.63
ACE	6C5	INDEPENDENCE MUNI	INDEPENDENCE	IA	28988.	60417.	0.	0.48	0.59
ACE	FFL	FAIRFIELD MUNI	FAIRFIELD	IA	42569.	39327.	0.	1.68	0.54
ACE	IFA	IOWA FALLS MUNI	IOWA FALLS	IA	33647.	37069.	0.	0.43	0.47
ACE	3Y3	WINTERSET-MADISON COUNTY	WINTERSET	IA	40042.	23939.	0.	0.44	0.43
ACE	OOA	OSKALOOSA MUNI	OSKALOOSA	IA	20053.	31974.	0.	0.30	0.35
ACE	8C8	FLYERS	WATERLOO	IA	40085.	13083.	0.	0.40	0.35
ACE	HFT	HAMPTON MUNICIPAL	HAMPTON	IA	17304.	32823.	0.	0.27	0.33
ACE	C17	MARION	MARION	IA	34470.	14070.	0.	0.37	0.32
ACE	OK7	HUMBOLDT MUNI	HUMBOLDT	IA	29846.	12559.	0.	0.32	0.28
ACE	Y76	NORTH FIELD /PVT/	DES MOINES	IA	29539.	9644.	0.	0.31	0.26
ACE	K28	GREENFIELD MUNI	GREENFIELD	IA	25089.	13195.	0.	0.28	0.25
ACE	5C2	ANTIQUE AIRFIELD	BLAKESBURG	IA	26222.	8559.	0.	0.26	0.23
ACE	4C8	ALBIA MUNI	ALBIA	IA	17770.	16301.	0.	0.22	0.23

ACE	K44	VINTON VETERANS MEML ARPK	VINTON	IA	21157.	11912.	0.	0.24	0.22
ACE	5C8	EKMAN FIELD	DES MOINES	IA	17352.	12462.	0.	0.20	0.20
ACE	5D2	NORTHWOOD MUNI	NORTHWOOD	IA	17763.	11233.	0.	0.20	0.19
ACE	K25	HUSBAND FIELD	DALLAS CENTER	IA	20395.	7744.	0.	0.21	0.19
ACE	6C8	NICHOLS	LA PORTE CITY	IA	21677.	7075.	0.	0.22	0.19
ACE	4K6	BLOOMFIELD MUNI	BLOOMFIELD	IA	16043.	10534.	0.	0.18	0.18
ACE	D02	OSAGE MUNI	OSAGE	IA	19077.	7841.	0.	0.20	0.18
ACE	C61	WASHINGTON MUNI	WASHINGTON	IA	19070.	6224.	0.	0.20	0.17
ACE	1Y4	NEVADA MUNI	NEVADA	IA	17763.	7432.	0.	0.18	0.17
ACE	Y00	ZANGGER	LARCHWOOD	IA	16235.	7474.	0.	0.17	0.16
ACE	K36	ONAWA MUNI	ONAWA	IA	17324.	5654.	0.	0.17	0.15
ACE	K35	MISSOURI VALLEY	MISSOURI VALLEY	IA	16784.	5478.	0.	0.17	0.15
ACE	Y43	ANITA MUNI-KEVIN BURKE MEMORIAL FIELD	ANITA	IA	15159.	4948.	0.	0.15	0.13
ACE	0K4	EAGLE GROVE MUNI	EAGLE GROVE	IA	8531.	7791.	0.	0.11	0.11
ACE	5C3	BEEDS LAKE	HAMPTON	IA	11631.	3796.	0.	0.12	0.10
ACE	D03	SIBLEY MUNI	SIBLEY	IA	8156.	6482.	0.	0.10	0.10
ACE	2Y4	ROCKWELL CITY MUNI	ROCKWELL CITY	IA	10625.	3468.	0.	0.11	0.09
ACE	6C0	ELDORA MUNI	ELDORA	IA	5415.	7202.	0.	0.07	0.08
ACE	1Y9	PAULLINA MUNI	PAULLINA	IA	8662.	2827.	0.	0.09	0.08
ACE	K37	OSCEOLA MUNI	OSCEOLA	IA	8412.	3290.	0.	0.09	0.08
ACE	8C4	MATHEWS MEMORIAL	TIPTON	IA	9292.	3033.	0.	0.10	0.08
ACE	7C3	MONONA MUNI	MONONA	IA	9591.	3131.	0.	0.10	0.08
ACE	7C5	SIG FIELD	MONTEZUMA	IA	6657.	2173.	0.	0.07	0.06
ACE	0Y0	GUTHRIE CENTER MUNI	GUTHRIE CENTER	IA	7144.	2332.	0.	0.07	0.06
ACE	0Y5	NASH FIELD INDIANOLA	INDIANOLA	IA	6073.	3069.	0.	0.06	0.06
ACE	Y67	ELLEN CHURCH FIELD	CRESCO	IA	6126.	2000.	0.	0.06	0.05
ACE	K29	GRINNELL	GRINNELL	IA	5314.	2379.	0.	0.05	0.05
ACE	C27	MANCHESTER MUNI	MANCHESTER	IA	6015.	1963.	0.	0.06	0.05
ACE	0Y7	LAMONI MUNICIPAL	LAMONI	IA	1843.	602.	0.	0.02	0.02
ACE	IXD	JOHNSON COUNTY INDUSTRIAL	OLATHE	KS	1517568.	288438.	995.	6.35*	12.00*
ACE	3LA	LAWRENCE MUNI	LAWRENCE	KS	936718.	253983.	831.	5.98*	7.98*
ACE	LBL	LIBERAL MUNI	LIBERAL	KS	634796.	221771.	523.	5.61	5.69
ACE	MHK	MANHATTAN MUNI	MANHATTAN	KS	581753.	210398.	439.	4.39	5.26
ACE	GCK	GARDEN CITY MUNI	GARDEN CITY	KS	532720.	200987.	362.	3.06	4.87
ACE	3KM	COMOTARA AIRPARK	WICHITA	KS	451762.	183679.	450.	3.30*	4.22*
ACE	3AU	AUGUSTA MUNI	AUGUSTA	KS	519681.	109632.	519.	3.55*	4.18*
ACE	EWK	NEWTON-CITY-COUNTY	NEWTON	KS	523942.	102422.	446.	4.05	4.16
ACE	HYS	HAYS MUNI	HAYS	KS	331908.	164231.	280.	2.83	3.30
ACE	WLD	STROTHER FIELD	WINFIELD/ARKANSAS CITY	KS	357800.	114482.	342.	3.38	3.14
ACE	EMP	EMPORIA MUNI	EMPORIA	KS	401798.	68857.	330.	2.32*	3.13*
ACE	FSK	FORT SCOTT MUNI	FORT SCOTT	KS	292003.	66607.	284.	2.38	2.38
ACE	PTS	ATKINSON MUNI	PITTSBURG	KS	242665.	68405.	234.	1.94	2.07
ACE	CFV	COFFEYVILLE MUNI	COFFEYVILLE	KS	174359.	108004.	161.	1.74	1.88
ACE	CNU	CHANUTE MARTIN JOHNSON	CHANUTE	KS	179758.	96503.	181.	1.40*	1.84*
ACE	CEA	CESSNA ACFT FIELD	WICHITA	KS	228778.	39378.	223.	1.50*	1.78*
ACE	IDP	INDEPENDENCE MUNI	INDEPENDENCE	KS	152274.	104463.	148.	1.39	1.71
ACE	GBD	GREAT BEND MUNI	GREAT BEND	KS	102765.	138884.	1.	3.94	1.61
ACE	BEC	BEECH FACTORY	WICHITA	KS	189702.	39820.	135.	1.19*	1.53*
ACE	RSL	RUSSELL MUNI	RUSSELL	KS	160672.	32986.	151.	1.02*	1.29*
ACE	LYO	LYONS-RICE COUNTY MUNI	LYONS	KS	160025.	29049.	150.	1.39	1.26
ACE	PHG	PHILLIPSBURG MUNI	PHILLIPSBURG	KS	101776.	58905.	98.	0.76*	1.07*
ACE	K95	ULYSSES	ULYSSES	KS	107833.	45368.	81.	1.47	1.02
ACE	PPF	TRI CITY	PARSONS	KS	30285.	115227.	1.	1.47	0.97
ACE	2K4	LARNED-PAWNEE COUNTY	LARNED	KS	109480.	24071.	108.	0.71*	0.89*
ACE	3KC	STATE LINE AIRPARK	LEAWOOD	KS	100045.	32651.	0.	1.03	0.88
ACE	K32	RIVERSIDE	WICHITA	KS	81832.	37528.	0.	0.86	0.79
ACE	3JC	JUNCTION CITY MUNI	JUNCTION CITY	KS	[illegible]4642.	70801.	0.	0.65	0.77
ACE	2K3	STANTON COUNTY MUNI	JOHNSON	KS	80099.	35741.	270.	1.30	0.77
ACE	K31	COPELAND	WICHITA	KS	89887.	18617.	85.	0.55*	0.72*

ACE	RPB	BELLEVILLE MUNI	BELLEVILLE	KS	57549.	36487.	53.	0.43*	0.62*
ACE	1K4	EL DORADO MUN	EL DORADO	KS	72046.	17198.	307.	1.49	0.59
ACE	PTT	PRATT MUNI	PRATT	KS	72734.	14308.	61.	0.77	0.58
ACE	H77	WELLINGTON MUNI	WELLINGTON	KS	64682.	21255.	235.	1.76	0.57
ACE	8K4	MEADE MUNI	MEADE	KS	64322.	16758.	58.	0.39*	0.54*
ACE	K88	ALLEN COUNTY	IOLA	KS	32451.	46070.	0.	0.46	0.52
ACE	K78	ABILENE MUNI	ABILENE	KS	40050.	34100.	0.	0.46	0.49
ACE	2K9	SCOTT CITY MUNI	SCOTT CITY	KS	31393.	36573.	0.	0.40	0.45
ACE	K50	COOK AIRFIELD INC	DERBY	KS	47662.	15561.	0.	0.49	0.42
ACE	1K2	CLAY CENTER MUNI	CLAY CENTER	KS	20772.	42242.	0.	0.34	0.42
ACE	CBK	SHALTZ FIELD	COLBY	KS	29615.	32158.	0.	1.24	0.41
ACE	K74	OAKLEY MUNI	OAKLEY	KS	30821.	31088.	0.	0.37	0.41
ACE	K61	BELOIT MUNI	BELOIT	KS	30617.	29468.	105.	0.75	0.40
ACE	1K1	BENTON	BENTON	KS	43324.	11670.	120.	0.79	0.37
ACE	MPR	MCPHERSON	MCPHERSON	KS	39153.	12778.	0.	1.62	0.35
ACE	K75	OSBORNE MUNI	OSBORNE	KS	10514.	42794.	0.	0.24	0.35
ACE	7K1	HERINGTON MUNI	HERINGTON	KS	23476.	27053.	80.	0.65	0.34
ACE	ANY	ANTHONY MUNI	ANTHONY	KS	37911.	12237.	130.	0.88	0.33
ACE	HLC	HILL CITY MUNI	HILL CITY	KS	32191.	15806.	0.	0.35	0.32
ACE	1K8	HUGOTON MUNI	HUGOTON	KS	35978.	11743.	0.	0.37	0.32
ACE	KS04	PLAINVILLE ARPK	PLAINVILLE	KS	12753.	29473.	0.	0.21	0.28
ACE	K68	GARNETT MUNI	GARNETT	KS	19910.	17317.	0.	0.24	0.25
ACE	30T	OTTAWA MUNI	OTTAWA	KS	27147.	9941.	0.	0.28	0.25
ACE	9K8	KINGMAN MUNI	KINGMAN	KS	23381.	12930.	0.	0.25	0.24
ACE	K60	ATWOOD-RAWLINS COUNTY CITY-COUNTY	ATWOOD	KS	18392.	16505.	0.	0.22	0.23
ACE	K34	GARDNER MUNI	GARDNER	KS	24543.	8011.	0.	0.25	0.22
ACE	K81	OSAWATOMIE-PAOLA MUNI	OSAWATOMIE/PAOLA	KS	19015.	11193.	0.	0.21	0.20
ACE	K59	AMELIA EARHART	ATCHISON	KS	22234.	7257.	0.	0.23	0.20
ACE	13K	EUREKA MUNI	EUREKA	KS	19078.	7580.	0.	0.20	0.18
ACE	K80	OBERLIN MUNI	OBERLIN	KS	14057.	13029.	0.	0.17	0.18
ACE	K73	NORTON MUNI	NORTON	KS	14226.	9943.	0.	0.16	0.16
ACE	5K2	TRIBUNE MUNI	TRIBUNE	KS	18070.	5898.	0.	0.19	0.16
ACE	1K5	ELKHART-MORTON COUNTY	ELKHART	KS	14967.	6135.	0.	0.16	0.14
ACE	7V3	ST FRANCIS MUNI	ST FRANCIS	KS	7236.	12863.	0.	0.11	0.13
ACE	2K7	NEODESHA MUNI	NEODESHA	KS	16618.	3091.	15.	0.14	0.13
ACE	2K5	MARYSVILLE MUNI	MARYSVILLE	KS	13982.	4564.	0.	0.14	0.12
ACE	69K	WAMEGO MUNI	WAMEGO	KS	12272.	4005.	0.	0.12	0.11
ACE	3TA	STAFFORD MUNI	STAFFORD	KS	7255.	7667.	0.	0.09	0.10
ACE	8K8	CIMARRON MUNICIPAL	CIMARRON	KS	11826	3860.	0.	0.12	0.10
ACE	3K3	SYRACUSE-HAMILTON COUNTY MUNI	SYRACUSE	KS	8269.	2699.	0.	0.08	0.07
ACE	70K	MAIZE	WICHITA/MAIZE/	KS	6393.	2087.	0.	0.06	0.06
ACE	56K	PLAINS MUNI	PLAINS	KS	6594.	2152.	0.	0.07	0.06
ACE	K64	VINLAND VALLEY AERODROME	BALDWIN CITY	KS	7158.	2336.	0.	0.07	0.06
ACE	1K3	HAMILTON FIELD	DERBY	KS	7256.	2368.	0.	0.07	0.06
ACE	K82	SMITH CENTER MUNI	SMITH CENTER	KS	6026.	1967.	0.	0.06	0.05
ACE	K71	LINCOLN MUNI	LINCOLN	KS	6184.	2019.	0.	0.06	0.05
ACE	3WE	WEISS	ST LOUIS	MO	1827253.	376423.	1287.	8.56*	14.64*
ACE	K84	MC COMAS-LEE'S SUMMIT MUNI	LEES SUMMIT	MO	1758036.	302987.	1151.	7.76*	13.69*
ACE	3GV	EAST KANSAS CITY	GRAIN VALLEY	MO	1052323.	289708.	1022.	8.70	8.92
ACE	3SZ	ST. CHARLES COUNTY	ST CHARLES	MO	977499.	182687.	745.	4.92*	7.71*
ACE	JEF	JEFFERSON CITY MEML	JEFFERSON CITY	MO	881824.	255538.	832.	6.00*	7.56*
ACE	VIH	ROLLA NATIONAL	ROLLA/VICHY	MO	682205.	217619.	716.	4.38	5.98
ACE	K07	ROLLA DOWNTOWN	ROLLA	MO	676763.	219819.	682.	5.27*	5.96*
ACE	HIG	HIGGINSVILLE INDUSTRIAL MUNI	HIGGINSVILLE	MO	494009.	118060.	446.	6.41	4.07
ACE	MAW	MALDEN MUNI	MALDEN	MO	428299.	170532.	426.	3.10	3.98
ACE	K48	CHILLICOTHE MUNICIPAL	CHILLICOTHE	MO	345538.	144299.	289.	2.77	3.25
ACE	POF	EARL FIELDS MEMORIAL	POPLAR BLUFF	MO	308044.	160950.	177.	1.92	3.12
ACE	AIZ	LEE C FINE MEMORIAL	KAISER/LAKE OZARK/	MO	243239.	147271.	179.	2.02	2.59
ACE	M43	DEXTER MUNI	DEXTER	MO	315393.	66703.	301.	2.77	2.54

ACE	3SQ	ST CHARLES	ST CHARLES	MO	278257.	75229.	266.	1.91	2.35
ACE	K24	E W COTTON WOODS MEMORIAL	COLUMBIA	MO	271739.	78127.	270.	1.82*	2.32*
ACE	LBO	FLOYD W. JONES LEBANON	LEBANON	MO	247137.	54988.	239.	1.96	2.01
ACE	M62	COUNTY MEMORIAL	NEW MADRID	MO	209169.	61235.	210.	1.52*	1.80*
ACE	BUM	BUTLER MEMORIAL	BUTLER	MO	208872.	35943.	218.	1.41*	1.63*
ACE	FAM	FARMINGTON REGIONAL	FARMINGTON	MO	123614.	119145.	100.	1.94	1.61
ACE	MBY	OMAR N BRADLEY	MOBERLY	MO	144905.	76912.	138.	1.23	1.47
ACE	H63	WEST PLAINS MUNI	WEST PLAINS	MO	89785.	127280.	0.	1.23	1.44
ACE	2K2	AIR PARK SOUTH	OZARK	MO	128485.	51248.	104.	0.91	1.19
ACE	H22	FESTUS MEML	FESTUS	MO	74991.	97917.	134.	2.37	1.15
ACE	3DW	DOWNTOWN	SPRINGFIELD	MO	68034.	98396.	0.	0.97	1.11
ACE	02K	ARROWHEAD	ST LOUIS	MO	93103.	67518.	0.	1.10	1.07
ACE	IRK	CLARENCE CANNON MEMORIAL	KIRKSVILLE	MO	41115.	118782.	0.	1.71	1.06
ACE	K02	PERRYVILLE MUN	PERRYVILLE	MO	130021.	27508.	129.	0.87*	1.05*
ACE	SIK	SIKESTON MEML MUNI	SIKESTON	MO	68599.	83507.	0.	2.64	1.01
ACE	82K	CAMERON MUNI	CAMERON	MO	86611.	58908.	0.	1.00	0.97
ACE	3IP	INDEPENDENCE MEMORIAL	INDEPENDENCE	MO	104191.	34008.	0.	1.08	0.92
ACE	DMO	SEDALIA MEMORIAL	SEDALIA	MO	19128.	111586.	1.	1.29	0.87
ACE	MO50	WENTZVILLE	WENTZVILLE	MO	63325.	65653.	0.	0.80	0.86
ACE	H41	MEXICO MEMORIAL	MEXICO	MO	82911.	37935.	75.	0.59*	0.80*
ACE	PLK	M GRAHAM CLARK	POINT LOOKOUT /BRANSON	MO	78271.	39635.	73.	0.65	0.78
ACE	TRX	TRENTON MUNICIPAL	TRENTON	MO	90148.	18762.	69.	1.36	0.72
ACE	84K	CLINTON MEMORIAL	CLINTON	MO	73017.	24598.	61.	0.71	0.65
ACE	VER	JESSE VIERTEL MEMORIAL	BOONVILLE	MO	58894.	36073.	1.	1.78	0.63
ACE	NVD	NEVADA MUNI	NEVADA	MO	73874.	20243.	58.	1.10	0.63
ACE	K15	LINN CREEK-GRAND GLAIZE MEML	OSAGE BEACH	MO	50108.	41305.	0.	0.61	0.61
ACE	MNF	MOUNTAIN VIEW	MOUNTAIN VIEW	MO	11271.	74380.	0.	0.36	0.57
ACE	EOS	NEOSHO MEML	NEOSHO	MO	55150.	30516.	1.	2.27	0.57
ACE	MHL	MARSHALL MEML MUNI	MARSHALL	MO	35523.	47193.	0.	0.49	0.55
ACE	1HO	CREVE COEUR	ST LOUIS	MO	55762.	23236.	0.	0.59	0.52
ACE	9K4	SKYHAVEN	WARRENSBURG	MO	57613.	20434.	194.	1.28	0.52
ACE	2H2	AURORA MEMORIAL MUNI	AURORA	MO	15637.	61336.	0.	0.34	0.51
ACE	MO49	WASHINGTON MEMORIAL	WASHINGTON	MO	27957.	42864.	0.	0.40	0.47
ACE	3EX	EXCELSIOR SPRINGS MEMORIAL	EXCELSIOR SPRINGS	MO	22698.	48099.	0.	0.38	0.47
ACE	75K	BETHANY MEMORIAL	BETHANY	MO	51844.	16926.	0.	0.51	0.46
ACE	94K	CASSVILLE MUNICIPAL	CASSVILLE	MO	54921.	9452.	52.	0.35*	0.43*
ACE	H19	BOWLING GREEN MUNICIPAL	BOWLING GREEN	MO	39525.	25938.	134.	0.94	0.43
ACE	3VS	ROY OTTEN MEMORIAL AIRFIELD	VERSAILLES	MO	16971.	43609.	0.	0.30	0.40
ACE	HAE	HANNIBAL MUNI	HANNIBAL	MO	28095.	29613.	0.	1.18	0.38
ACE	K56	MARYVILLE MEML	MARYVILLE	MO	24082.	28266.	0.	0.32	0.35
ACE	H21	CAMDENTON MEMORIAL	CAMDENTON	MO	24553.	24329.	0.	0.30	0.32
ACE	H20	MYERS PARK MEMORIAL MUNICIPAL	CARTHAGE	MO	35436.	11566.	0.	0.37	0.31
ACE	MO5	CARUTHERSVILLE MEMORIAL	CARUTHERSVILLE	MO	18717.	28602.	0.	0.27	0.31
ACE	H74	CABOOL MEMORIAL	CABOOL	MO	31256.	13168.	99.	0.66	0.30
ACE	4K3	LEXINGTON MUNI	LEXINGTON	MO	16726.	28300.	0.	0.25	0.30
ACE	35M	MISSISSIPPI COUNTY	CHARLESTON	MO	24249.	18415.	0.	0.29	0.28
ACE	MO10	ROOSTERVILLE	LIBERTY	MO	28508.	9306.	0.	0.29	0.25
ACE	M14	KENNETT MEMORIAL	KENNETT	MO	20737.	16883.	0.	0.25	0.25
ACE	UBX	CUBA MUNI	CUBA	MO	23484.	10393.	0.	0.24	0.23
ACE	MO43	STOCKTON MUNI	STOCKTON	MO	23903.	7801.	0.	0.23	0.21
ACE	MO08	LAKE WINNEBAGO MUNI	LAKE WINNEBAGO	MO	22882.	7469.	0.	0.24	0.20
ACE	MO16	MEMPHIS MEMORIAL	MEMPHIS	MO	14180.	15875.	0.	0.18	0.20
ACE	M12	STEELE MUNI	STEELE	MO	22318.	8408.	0.	0.22	0.20
ACE	H65	FULTON MUNI	FULTON	MO	14883.	14089.	48.	0.36	0.19
ACE	K39	ST CLAIR MEMORIAL	ST CLAIR	MO	19884.	9308.	0.	0.22	0.19
ACE	K52	MONROE CITY REGIONAL	MONROE CITY	MO	23779.	4223.	23.	0.15*	0.19*
ACE	34M	CAMPBELL MUNI	CAMPBELL	MO	19866.	6485.	0.	0.20	0.18
ACE	MO85	HARRISONVILLE	HARRISONVILLE	MO	18896.	8698.	0.	0.20	0.18
ACE	4MO4	MISSOURI CITY	LIBERTY	MO	13819.	9629.	0.	0.16	0.16
ACE	1H5	WILLOW SPRINGS MEMORIAL	WILLOW SPRINGS	MO	17283.	5641.	0.	0.17	0.15

ACE	73K	BILL MARTIN MEMORIAL	AVA	MO	15743.	5138.	0.	0.15	0.14
ACE	H64	LAMAR MUNI	LAMAR	MO	13454.	4391.	0.	0.13	0.12
ACE	H62	SULLIVAN MEMORIAL	SULLIVAN	MO	12566.	4101.	0.	0.13	0.11
ACE	K04	HAERR FIELD	TAYLOR	MO	11336.	3700.	0.	0.12	0.10
ACE	K57	GOULD PETERSON MUNICIPAL	TARKIO	MO	11839.	3864.	0.	0.12	0.10
ACE	MO14	MANSFIELD MUNI	MANSFIELD	MO	8856.	5708.	0.	0.10	0.10
ACE	M84	BOONVILLE MUNI	BOONVILLE	MO	10735.	3504.	0.	0.11	0.09
ACE	K89	MACON-FOWER MEML	MACON	MO	7778.	2539.	0.	0.08	0.07
ACE	78Y	RANKIN	MARYVILLE	MO	6169.	4194.	0.	0.07	0.07
ACE	H79	ELDON MODEL AIRPARK	ELDON	MO	8239.	2689.	0.	0.08	0.07
ACE	M48	HOUSTON MEMORIAL	HOUSTON	MO	7368.	2405.	0.	0.08	0.06
ACE	K33	SALEM MEMORIAL	SALEM	MO	6629.	2164.	0.	0.06	0.06
ACE	K26	CARROLLTON MEMORIAL	CARROLLTON	MO	5778.	1886.	0.	0.06	0.05
ACE	4K5	ALBANY MEMORIAL	ALBANY	MO	3987.	1301.	0.	0.04	0.04
ACE	MO03	MODERS	HOUSE SPRINGS	MO	3158.	1031.	0.	0.03	0.03
ACE	MO13	TWIN CITY AIRPARK	LUTESVILLE	MO	3600.	1175.	0.	0.04	0.03
ACE	89K	FARRIS STRIP	FAUCETT	MO	1017.	332.	0.	0.01	0.01
ACE	EAR	KEARNEY MUNI	KEARNEY	NE	569950.	202691.	515.	4.10	5.13
ACE	OLU	COLUMBUS MUNI	COLUMBUS	NE	411588.	175893.	382.	3.15	3.90
ACE	HSI	HASTINGS MUNI	HASTINGS	NE	346635.	164374.	302.	2.63	3.40
ACE	MCK	MCCOOK MUNI	MCCOOK	NE	290425.	156788.	262.	2.76	2.97
ACE	MLE	MILLARD	OMAHA	NE	274805.	164484.	0.	5.78	2.92
ACE	SNY	SIDNEY MUNI	SIDNEY	NE	201984.	141458.	174.	2.00	2.28
ACE	AIA	ALLIANCE MUNI	ALLIANCE	NE	190141.	139272.	137.	1.74	2.19
ACE	FET	FREMONT MUNI	FREMONT	NE	197005.	131372.	185.	1.73	2.18
ACE	CDR	CHADRON MUNI	CHADRON	NE	194104.	117525.	134.	2.00	2.07
ACE	BIE	BEATRICE MUNI	BEATRICE	NE	176602.	96760.	160.	1.36	1.82
ACE	CZD	COZAD MUNI	COZAD	NE	144342.	45548.	139.	0.96*	1.26*
ACE	HDE	BREWSTER FIELD	HOLDREGE	NE	97393.	45759.	92.	0.81	0.95
ACE	LCG	WAYNE MUNI	WAYNE	NE	80045.	59049.	74.	0.63*	0.92*
ACE	OGA	SEARLE FIELD	OGALLALA	NE	91388.	29604.	58.	1.53	0.80
ACE	BBW	BROKEN BOW MUNI	BROKEN BOW	NE	34402.	81248.	24.	0.53	0.77
ACE	3NO	NORTH OMAHA	OMAHA	NE	71371.	43112.	0.	0.79	0.76
ACE	LXN	LEXINGTON MUNI	LEXINGTON	NE	34449.	75698.	0.	1.46	0.73
ACE	ANW	AINSWORTH MUNI	AINSWORTH	NE	15151.	83065.	0.	0.66	0.65
ACE	7K8	MARTIN FIELD	SO SIOUX CITY	NE	52816.	41947.	0.	0.62	0.63
ACE	PMV	PLATTSMOUTH MUNI	PLATTSMOUTH	NE	73630.	19262.	232.	1.49	0.62
ACE	ONL	O NEILL MUNI	O NEILL	NE	67470.	24344.	64.	0.53	0.61
ACE	09K	SARGENT MUNI	SARGENT	NE	3670.	76475.	0.	0.30	0.53
ACE	K46	FLIGHTLAND	OMAHA	NE	48839.	21358.	0.	0.51	0.47
ACE	AUH	AURORA MUNI	AURORA	NE	37512.	26549.	98.	0.90	0.43
ACE	GTE	GOTHENBURG MUNI	GOTHENBURG	NE	34831.	19898.	112.	0.75	0.36
ACE	08K	HARVARD STATE	HARVARD	NE	34770.	17554.	0.	0.38	0.35
ACE	K17	YORK MUNI	YORK	NE	20699.	31144.	0.	0.29	0.34
ACE	4V7	KIMBALL MUNI	KIMBALL	NE	11929.	30222.	0.	0.21	0.28
ACE	30A	SOUTH OMAHA	OMAHA /PAPILLION/	NE	23375.	12582.	0.	0.25	0.24
ACE	9V5	MODISETT	RUSHVILLE	NE	5866.	26613.	0.	0.14	0.22
ACE	4V9	ANTELOPE COUNTY	NELIGH	NE	19429.	11641.	0.	0.21	0.21
ACE	ODX	EVELYN SHARP FIELD	ORD	NE	14239.	15483.	0.	0.18	0.20
ACE	OV3	PIONEER VILLAGE FIELD	MINDEN	NE	11425.	18650.	0.	0.17	0.20
ACE	12K	SUPERIOR MUNI	SUPERIOR	NE	15752.	14530.	25.	0.26	0.20
ACE	OKS	OSHKOSH MUNI	OSHKOSH	NE	23270.	5742.	0.	0.14	0.19
ACE	IML	IMPERIAL MUNI	IMPERIAL	NE	14977.	14095.	37.	0.29	0.19
ACE	NE22	TEKAMAH	TEKAMAH	NE	20251.	6612.	0.	0.21	0.18
ACE	07K	CENTRAL CITY MUNI	CENTRAL CITY	NE	12053.	14435.	0.	0.15	0.18
ACE	84Y	BLOOMFIELD MUNI	BLOOMFIELD	NE	17460.	8414.	0.	0.18	0.17
ACE	93Y	DAVID CITY MUNI	DAVID CITY	NE	9705.	16243.	0.	0.14	0.17
ACE	FNB	BRENNER FIELD	FALLS CITY	NE	18421.	6013.	0.	0.19	0.16
ACE	FBY	FAIRBURY MUNI	FAIRBURY	NE	14731.	9443.	32.	0.25	0.16

ACE	BUB	CRAM FIELD	BURWELL	NE	10119.	11814.	9.	0.09*	0.15*
ACE	SCB	SCRIBNER STATE	SCRIBNER	NE	13659.	9411.	0.	0.16	0.15
ACE	7NE7	SEWARD MUNI	SEWARD	NE	11135.	11562.	0.	0.14	0.15
ACE	AHQ	WAHOO MUNI	WAHOO	NE	15895.	6082.	10.	0.12*	0.15*
ACE	K13	FAIRMONT STATE AIRFIELD	FAIRMONT	NE	12204.	10231.	0.	0.15	0.15
ACE	15K	ALBION MUNI	ALBION	NE	12863.	9470.	0.	0.14	0.15
ACE	CSB	CAMBRIDGE MUNI	CAMBRIDGE	NE	11875.	8963.	0.	0.14	0.14
ACE	3GN	GRUNDMAN	NEBRASKA CITY	NE	14812.	4836.	0.	0.15	0.13
ACE	NE02	HARTINGTON MUNI	HARTINGTON	NE	6033.	13016.	0.	0.10	0.13
ACE	6K3	CREIGHTON MUNI	CREIGHTON	NE	5363.	14120.	0.	0.10	0.13
ACE	5V3	THOMAS COUNTY	THEDFORD	NE	8304.	9749.	5.	0.08*	0.12*
ACE	K03	CRETE MUNI	CRETE	NE	8363.	10146.	0.	0.31	0.12
ACE	47V	CURTIS MUNI	CURTIS	NE	8279.	7654.	0.	0.10	0.11
ACE	GRN	GORDON MUNI	GORDON	NE	7820.	7504.	0.	0.10	0.10
ACE	0V0	GRANT MUNI	GRANT	NE	9960.	3252.	0.	0.10	0.09
ACE	K09	HEBRON MUNI	HEBRON	NE	7403.	4875.	0.	0.08	0.08
ACE	7V7	RED CLOUD MUNI	RED CLOUD	NE	7402.	2416.	0.	0.07	0.07
ACE	K01	AUBURN MUNI	AUBURN	NE	7013.	4175.	0.	0.06	0.06
ACE	NE21	TECUMSEH MUNICIPAL	TECUMSEH	NE	6973.	2276.	0.	0.07	0.06
ACE	NE23	FLYING V	UTICA	NE	5701.	1861.	0.	0.06	0.05
ACE	8V2	STUART-ATKINSON MUNI	STUART/ATKINSON	NE	4633.	2072.	0.	0.05	0.04

EASTERN REGION

AEA	33N	DELAWARE AIRPARK	DOVER/CHESWOLD	DE	639262.	211667.	652.	3.29	5.65
AEA	GED	SUSSEX COUNTY	GEORGETOWN	DE	331583.	163185.	321.	2.35	3.29
AEA	REH	REHOBOTH AIRCRAFTERS	REHOBOTH BEACH	DE	257095.	139130.	241.	1.91*	2.63*
AEA	N92	SUMMIT AIRPARK	MIDDLETOWN	DE	96944.	65996.	0.	2.96	1.08
AEA	0N4	CHANDELLE ESTATES	DOVER	DE	75202.	73660.	0.	0.94	0.99
AEA	N98	MILFORD AIRPARK	MILFORD	DE	11217.	20145.	0.	0.17	0.21
AEA	15N	JENKINS	WYOMING	DE	12992.	9734.	0.	0.15	0.15
AEA	38N	SMYRNA	SMYRNA	DE	11626.	6551.	0.	0.12	0.12
AEA	N06	LAUREL	LAUREL	DE	8739.	2853.	0.	0.09	0.08
AEA	SBY	SALISBURY-WICOMICO COUNTY	SALISBURY	MD	1424433.	338446.	0.	2.29	11.71
AEA	GAI	MONTGOMERY COUNTY ARPK	GAITHERSBURG	MD	1300322.	331389.	1263.	8.71	10.84
AEA	MTN	GLENN L. MARTIN STATE	BALTIMORE	MD	809587.	159066.	740.	4.27*	6.44*
AEA	W18	SUBURBAN	LAUREL	MD	700564.	130159.	644.	4.16*	5.52*
AEA	FDK	FREDERICK MUNI	FREDERICK	MD	596747.	135097.	498.	5.81	4.86
AEA	N80	OCEAN CITY	OCEAN CITY	MD	506517.	193248.	0.	1.40	4.65
AEA	ANP	LEE	ANNAPOLIS	MD	570122.	115292.	537.	3.52*	4.55*
AEA	CBE	CUMBERLAND MUNI	CUMBERLAND	MD	396671.	154278.	367.	2.86*	3.66*
AEA	2G4	GARRETT COUNTY	OAKLAND	MD	241386.	111434.	250.	1.03	2.34
AEA	2W6	ST MARYS COUNTY	LEONARDTOWN	MD	261956.	72876.	0.	0.61	2.22
AEA	W48	ESSEX SKYPARK	BALTIMORE	MD	262627.	53852.	197.	1.64*	2.10*
AEA	W42	FALLSTON	FALLSTON	MD	232942.	63323.	209.	0.59*	1.97*
AEA	ESN	EASTON MUNI	EASTON	MD	117464.	143337.	1.	4.10	1.73
AEA	W00	FREEWAY	MITCHELLVILLE	MD	116174.	48401.	0.	1.19	1.09
AEA	W29	BAY BRIDGE INDUSTRIAL	STEVENSVILLE	MD	127148.	35110.	311.	2.14	1.08
AEA	W32	HYDE FLD	CLINTON	MD	112917.	42134.	0.	1.19	1.03
AEA	W54	WESTMINSTER	WESTMINSTER	MD	102690.	25187.	81.	0.86	0.85
AEA	CGE	CAMBRIDGE MUNI	CAMBRIDGE	MD	38025.	69090.	0.	0.51	0.71
AEA	W28	P G AIRPARK	FRIENDLY	MD	73629.	31952.	0.	0.76	0.70
AEA	1W2	BALTIMORE AIRPARK	BALTIMORE	MD	69476.	25345.	0.	0.70	0.63
AEA	0W3	ALDINO	CHURCHVILLE	MD	30536.	62571.	0.	0.48	0.62
AEA	W50	DAVIS	LAYTONSVILLE	MD	63302.	20663.	0.	0.63	0.56
AEA	2W5	MARYLAND	INDIAN HEAD	MD	46496.	30921.	0.	0.52	0.51
AEA	2W2	CLEARVIEW AIRPARK	WESTMINSTER	MD	56250.	11261.	44.	0.34*	0.45*

AEA	CGS	COLLEGE PARK	COLLEGE PARK	MD	32813.	15990.	0.	0.34	0.32
AEA	2W8	AQUA-LAND/CLIFFTON SKYPARK	NEWBURG	MD	34888.	11386.	0.	0.34	0.31
AEA	2N0	CECIL COUNTY AIRPARK	ELKTON	MD	18545.	11333.	0.	0.20	0.20
AEA	W19	PARK HALL	PARK HALL	MD	18072.	5900.	0.	0.18	0.16
AEA	W41	CRISFIELD MUNI	CRISFIELD	MD	8924.	8205.	0.	0.11	0.11
AEA	0W2	DEEP CREEK AIRPARK	CHURCHTON	MD	5590.	1825.	0.	0.05	0.05
AEA	N87	TRENTON-ROBBINSVILLE	ROBBINSVILLE	NJ	4753774.	877609.	5133.	22.00	37.42
AEA	7MY	BURLINGTON COUNTY AIRPARK	MOUNT HOLLY	NJ	1475711.	364937.	1478.	9.90*	12.23*
AEA	WWD	CAPE MAY COUNTY	WILDWOOD	NJ	1137595.	291583.	1314.	5.88	9.50
AEA	BLM	MONMOUTH COUNTY	BELMAR-FARMINGDALE	NJ	1033627.	303423.	944.	8.42*	8.88*
AEA	16N	CAMDEN-BURLINGTON	BERLIN	NJ	994306.	178297.	972.	6.28*	7.79*
AEA	MIV	MILLVILLE MUNI	MILLVILLE	NJ	926928.	239208.	1026.	4.88	7.75
AEA	17N	CROSS KEYS	CROSS KEYS	NJ	511839.	163460.	494.	2.69	4.49
AEA	AIY	ATLANTIC CITY MUNI/BADER FIELD	ATLANTIC CITY	NJ	463629.	181497.	491.	2.96	4.32
AEA	3N9	SMITHVILLE AIRFIELD	SMITHVILLE	NJ	442824.	86185.	421.	3.20*	3.51*
AEA	N44	ROBERT J. MILLER AIR PARK	TOMS RIVER	NJ	373037.	108738.	405.	2.70	3.20
AEA	N12	LAKEWOOD	LAKEWOOD	NJ	384777.	64911.	403.	2.10	2.99
AEA	N83	BRIDGEPORT	BRIDGEPORT	NJ	359062.	75688.	345.	1.74	2.89
AEA	LDJ	LINDEN	LINDEN	NJ	233877.	160944.	0.	2.40	2.62
AEA	N52	SOMERSET	SOMERVILLE	NJ	200979.	170972.	0.	2.63	2.47
AEA	N81	HAMMONTON MUNI	HAMMONTON	NJ	285041.	59084.	256.	1.33*	2.29*
AEA	19N	ALBION	ALBION	NJ	175614.	98384.	71.	1.55*	1.82*
AEA	N63	SUSSEX	SUSSEX	NJ	195226.	63736.	0.	2.07	1.72
AEA	39N	PRINCETON	PRINCETON/ROCKY HILL/	NJ	104330.	133553.	285.	1.28	1.58
AEA	1N7	BLAIRSTOWN	BLAIRSTOWN	NJ	145145.	56810.	0.	1.57	1.34
AEA	N50	LI CALZI	BRIDGETON	NJ	134043.	48980.	0.	1.37	1.22
AEA	29N	KROELINGER	VINELAND	NJ	132781.	41251.	125.	0.90*	1.16*
AEA	26N	OCEAN CITY MUNI	OCEAN CITY	NJ	116897.	43448.	0.	1.25	1.07
AEA	N61	COLTS NECK	COLTS NECK	NJ	94043.	41145.	0.	0.99	0.90
AEA	N40	SKY MANOR	PITTSTOWN	NJ	112700.	23448.	126.	0.50	0.90
AEA	N73	RED LION	VINCENTOWN	NJ	93451.	26764.	62.	0.70*	0.80*
AEA	N85	ALEXANDRIA	PITTSTOWN	NJ	83021.	34945.	0.	0.87	0.78
AEA	N21	FORRESTAL	PRINCETON	NJ	0.	105363.	0.	0.51	0.70
AEA	47N	KUPPER	MANVILLE	NJ	46271.	55589.	0.	0.63	0.68
AEA	N64	SOMERSET HILLS	BASKING RIDGE	NJ	66973.	21862.	0.	0.71	0.59
AEA	N51	SOLBERG-HUNTERDON	READINGTON	NJ	64725.	22359.	0.	0.69	0.58
AEA	81N	FLANDERS VALLEY	FLANDERS	NJ	64490.	23488.	0.	0.69	0.58
AEA	N58	HANOVER	HANOVER	NJ	61510.	20080.	0.	0.62	0.54
AEA	72N	MANAHAWKIN	MANAHAWKIN	NJ	66363.	11609.	61.	0.40*	0.52*
AEA	2N8	MARLBORO	MATAWAN	NJ	31798.	33934.	0.	0.69	0.44
AEA	27N	SALEM AIRFIELD	SALEM	NJ	39822.	12997.	0.	0.40	0.35
AEA	N07	LINCOLN PARK	LINCOLN PARK	NJ	21833.	26024.	0.	0.30	0.32
AEA	12N	AEROFLEX-ANDOVER	ANDOVER	NJ	23192.	18071.	0.	0.28	0.27
AEA	25N	RUDYS	VINELAND	NJ	24624.	5260.	17.	0.16*	0.20*
AEA	N05	HACKETTSTOWN	HACKETTSTOWN	NJ	22954.	7493.	0.	0.24	0.20
AEA	1N6	NORDHEIM FLYING K AIRPARK	BARGAINTOWN	NJ	21404.	6987.	0.	0.22	0.19
AEA	24N	PITMAN	PITMAN	NJ	19783.	6458.	0.	0.20	0.17
AEA	4N1	GREENWOOD LAKE	WEST MILFORD	NJ	16637.	6680.	0.	0.18	0.16
AEA	N75	TWIN PINE	PENNINGTON	NJ	18204.	5943.	0.	0.18	0.16
AEA	1N4	WOODBINE MUNI	WOODBINE	NJ	10625.	12876.	0.	0.15	0.16
AEA	28N	VINELAND-DOWNSTOWN	VINELAND	NJ	14016.	4576.	0.	0.14	0.12
AEA	00N	BUCKS	BRIDGETON	NJ	9102.	2971.	0.	0.09	0.08
AEA	SWF	STEWART	NEWBURGH	NY	1801567.	399426.	1942.	10.39*	14.62*
AEA	FOK	SUFFOLK COUNTY	WESTHAMPTON BEACH	NY	1658190.	289936.	1585.	8.74*	12.94*
AEA	3G8	GENESEE COUNTY	BATAVIA	NY	1503258.	310453.	1646.	7.53	12.05
AEA	MGJ	ORANGE COUNTY	MONTGOMERY	NY	1245029.	256857.	1332.	9.66	9.98
AEA	N17	TRI-CITIES	ENDICOTT	NY	1148136.	299479.	1246.	9.50*	9.62*
AEA	DKK	DUNKIRK MUNI	DUNKIRK	NY	908703.	258701.	968.	5.10	7.76

AEA	SCH	SCHENECTADY COUNTY	SCHENECTADY	NY	914023.	155002.	877.	5.58*	7.10*
AEA	JHW	CHAUTAUQUA COUNTY	JAMESTOWN	NY	587206.	201677.	644.	3.14	5.24
AEA	9G0	BUFFALO AIRPARK	BUFFALO	NY	612135.	124948.	658.	3.24	4.90
AEA	ART	WATERTOWN NEW YORK INTL	WATERTOWN	NY	415483.	173092.	455.	2.02	3.91
AEA	N82	WURTSBORO-SULLIVAN COUNTY	WURTSBORO	NY	474276.	100958.	456.	3.08*	3.32*
AEA	N69	STORMVILLE	STORMVILLE	NY	460941.	90837.	449.	2.98*	3.67*
AEA	MSV	SULLIVAN COUNTY INTL	MONTICELLO	NY	397303.	143239.	473.	2.75	3.59
AEA	GFL	WARREN COUNTY	GLENS FALLS	NY	372851.	158732.	406.	2.98	3.53
AEA	1N1	BROOKHAVEN	SHIRLEY	NY	290289.	200118.	0.	9.88	3.26
AEA	N24	RAMAPO VALLEY	SPRING VALLEY	NY	268422.	192776.	0.	3.28	3.06
AEA	MSS	RICHARDS FIELD	MASSENA	NY	286411.	149942.	328.	1.62	2.90
AEA	OIC	LT.WARREN EATON	NORWICH	NY	177279.	135444.	187.	1.66*	2.08*
AEA	DSV	DANSVILLE MUNI	DANSVILLE	NY	142702.	150216.	0.	6.46	1.95
AEA	PLB	CLINTON CO	PLATTSBURGH	NY	156163.	131719.	169.	1.31	1.91
AEA	D35	PRIOR AVIATION SERVICE INC	BUFFALO	NY	135869.	149703.	0.	1.91	1.90
AEA	N03	CORTLAND COUNTY-CHASE FIELD	CORTLAND	NY	154622.	120564.	129.	3.10	1.83
AEA	9G3	AKRON	AKRON	NY	205029.	38557.	222.	0.99	1.62
AEA	44N	SKY ACRES	MILLBROOK	NY	113290.	122882.	109.	1.16*	1.57*
AEA	FLU	FLUSHING	NEW YORK/FLUSHING/	NY	177457.	57907.	0.	1.87	1.56
AEA	SLK	ADIRONDACK	SARANAC LAKE	NY	108833.	123641.	117.	0.95	1.54
AEA	HTO	EAST HAMPTON	EAST HAMPTON	NY	94883.	136327.	0.	1.52	1.54
AEA	N22	PENN YAN	PENN YAN	NY	100193.	124520.	91.	1.41	1.49
AEA	0B8	ELIZABETH FIELD	FISHERS ISLAND	NY	104916.	107766.	106.	1.03*	1.41*
AEA	N00	OSWEGO COUNTY	FULTON	NY	135253.	66544.	0.	5.19	1.34
AEA	06N	RANDALL	MIDDLETOWN	NY	170044.	31125.	165.	1.09*	1.34*
AEA	ELZ	WELLSVILLE MUNI ARPT,TARANTINE FLD	WELLSVILLE	NY	71045.	118467.	68.	1.00	1.26
AEA	10N	KOBELT	WALLKILL	NY	132004.	56546.	0.	1.47	1.25
AEA	5B2	SARATOGA COUNTY	SARATOGA SPRINGS	NY	86964.	95598.	0.	3.52	1.21
AEA	0G0	TRANSIT AIR PARK INC.	LOCKPORT	NY	33806.	116399.	0.	0.86	1.00
AEA	20N	KINGSTON-ULSTER	KINGSTON	NY	32651.	116021.	0.	0.85	0.99
AEA	1B1	COLUMBIA COUNTY	HUDSON	NY	31272.	115549.	1.	1.83	0.98
AEA	9G6	PINE HILL	ALBION	NY	122240.	24496.	117.	0.77*	0.97*
AEA	N23	SIDNEY MUNI	SIDNEY	NY	23796.	109782.	1.	1.12	0.89
AEA	7N3	SANDS POINT	PORT WASHINGTON	NY	13972.	109925.	0.	0.65	0.82
AEA	OGS	OGDENSBURG INTL	OGDENSBURG	NY	12503.	109444.	0.	0.97	0.81
AEA	46N	SKY PARK	RED HOOK	NY	84532.	37348.	86.	0.64*	0.81*
AEA	N66	ONEONTA MUNI	ONEONTA	NY	19625.	87198.	0.	0.53	0.71
AEA	D22	ANGOLA AIRWAYS	ANGOLA	NY	68251.	22277.	0.	0.67	0.60
AEA	OLE	OLEAN MUNI	OLEAN	NY	51267.	29490.	0.	1.78	0.54
AEA	0G7	SENECA FALLS AIRPORT INC	SENECA FALLS	NY	57587.	18797.	0.	0.62	0.51
AEA	34D	ORCHARD PARK	ORCHARD PARK	NY	54191.	17692.	0.	0.58	0.48
AEA	LKP	LAKE PLACID	LAKE PLACID	NY	32267.	37455.	0.	0.45	0.46
AEA	5B7	RENSSELAER COUNTY AIRPARK INC	TROY	NY	9749.	56912.	0.	0.32	0.44
AEA	D77	LANCASTER AIRPORT INC	LANCASTER	NY	46529.	15192.	0.	0.49	0.41
AEA	1B8	CANASTOTA	CANASTOTA	NY	30498.	22229.	0.	0.38	0.35
AEA	6G3	PALMYRA AIRPARK	PALMYRA	NY	31841.	20896.	0.	0.38	0.35
AEA	21N	MATTITUCK AIRBASE	MATTITUCK	NY	27919.	22564.	0.	0.35	0.34
AEA	4G2	HAMBURG AIRDROME INC.	HAMBURG	NY	34774.	11351.	0.	0.36	0.31
AEA	0B3	CAMILLUS	CAMILLUS	NY	34391.	11227.	0.	0.37	0.30
AEA	MAL	MALONE-DUFORT	MALONE	NY	16560.	27966.	0.	0.27	0.30
AEA	7N1	CORNING-PAINTED POST	CORNING	NY	25427.	18306.	0.	0.30	0.29
AEA	5G0	LE ROY (FREUDIGMAN FIELD)	LE ROY	NY	28815.	13009.	0.	0.31	0.28
AEA	B24	AMA EXECUTIVE AIRSTRIP	HAMILTON	NY	34720.	6031.	36.	0.23*	0.27*
AEA	MTP	SKY PORTEL	MONTAUK	NY	11229.	21460.	0.	0.19	0.22
AEA	6B4	FRANKFORT-HIGHLAND INC.	FRANKFORT /UTICA/	NY	23750.	7752.	0.	0.25	0.21
AEA	5B8	DUFLO	NEW BREMEN	NY	7829.	20421.	0.	0.16	0.19
AEA	NY10	MICHAEL FIELD	CICEPO	NY	16936.	10547.	0.	0.20	0.18
AEA	01G	PERRY-WARSAW	PERRY	NY	18005.	7052.	0.	0.20	0.17
AEA	N77	MAHOPAC	MAHOPAC	NY	17411.	7571.	0.	0.19	0.17
AEA	D51	CLARENCE AERODROME	EAST AMHERST	NY	18612.	6077.	0.	0.19	0.16

AEA	N72	WARWICK MUNI	WARWICK	NY	18669.	6095.	0.	0.20	0.16
AEA	NK03	KAMP	DURHAMVILLE	NY	16316.	5490.	0.	0.18	0.15
AEA	D70	HONEOYE FALLS	HONEOYE FALLS	NY	16555.	5405.	0.	0.17	0.15
AEA	8G3	GIERMEK EXECUTIVE	OLEAN	NY	15836.	5169.	0.	0.16	0.14
AEA	NY27	FULCO	JOHNSTOWN	NY	14944.	4878.	0.	0.16	0.13
AEA	23N	EDWARDS	BAYPORT	NY	9946.	8870.	0.	0.13	0.13
AEA	4B0	SOUTH ALBANY	SOUTH BETHLEHEM	NY	13078.	4270.	0.	0.14	0.12
AEA	D38	CANANDAIGUA	CANANDAIGUA	NY	12204.	3983.	0.	0.13	0.11
AEA	NY55	BURRELLO-MECHANICVILLE	MECHANICVILLE	NY	8905.	5417.	0.	0.10	0.10
AEA	N89	L.H.J./CHANNEL MASTER	ELLENVILLE	NY	6743.	7204.	0.	0.09	0.09
AEA	NY20	NELLIS FIELD	FORT PLAIN	NY	8012.	2615.	0.	0.09	0.07
AEA	9G5	ROYALTON	GASPORT	NY	8504.	2776.	0.	0.09	0.07
AEA	N37	MONTICELLO	MONTICELLO	NY	7048.	2480.	6.	0.05*	0.06*
AEA	B01	GRANVILLE	GRANVILLE	NY	6513.	2597.	0.	0.07	0.06
AEA	PTD	POTSDAM MUNI/DAMON FLD/	POTSDAM	NY	6904.	2253.	0.	0.07	0.06
AEA	4N2	CHENANGO BRIDGE	BINGHAMTON	NY	6505.	2123.	0.	0.07	0.06
AEA	4B1	DUANESBURO	DUANESBURG	NY	6734.	2199.	0.	0.07	0.06
AEA	7N2	PEEKSKILL	PEEKSKILL	NY	5354.	1748.	0.	0.06	0.05
AEA	D80	PALMER	OLCOTT	NY	5117.	1670.	0.	0.05	0.05
AEA	B16	WHITFORDS	WEEDSPORT	NY	5592.	1825.	0.	0.06	0.05
AEA	NY23	RYDERS SKYPORT	GOUVERNEUR	NY	2205.	3230.	0.	0.03	0.04
AEA	41N	F&F AIRPARK INC.	ONEONTA	NY	3710.	696.	3.	0.02*	0.03*
AEA	NY54	COOPERSTOWN-WESTVILLE	WESTVILLE	NY	2384.	1779.	0.	0.03	0.03
AEA	D79	DART	MAYVILLE	NY	1894.	618.	0.	0.02	0.02
AEA	1N2	SPADARO	EAST MORICHES	NY	2073.	677.	0.	0.02	0.02
AEA	NY03	ATHENS	ATHENS	NY	935.	305.	0.	0.01	0.01
AEA	G08	ROSTRAVER	MONONGAHELA	PA	1582569.	315030.	1544.	10.04*	12.61*
AEA	N25	BOB SHANNON MEMORIAL FIELD	DOWNINGTOWN	PA	1119470.	227241.	1060.	6.98*	8.95*
AEA	40N	CHESTER COUNTY G O CARLSON	COATESVILLE	PA	853697.	255518.	853.	4.45	7.37
AEA	1N9	ALLENTOWN QUEEN CITY MUNI	ALLENTOWN	PA	763764.	211316.	732.	4.98*	6.48*
AEA	LBE	WESTMORELAND COUNTY	LATROBE	PA	719481.	226791.	771.	6.49*	6.29*
AEA	JST	JOHNSTOWN-CAMBRIA COUNTY	JOHNSTOWN	PA	638572.	201590.	793.	2.16	5.58
AEA	N67	WINGS FIELD	PHILADELPHIA	PA	538121.	216958.	408.	3.70	5.02
AEA	G01	BEAVER COUNTY	BEAVER FALLS	PA	497904.	193863.	481.	3.49*	4.60*
AEA	BTP	BUTLER-GRAHAM	BUTLER	PA	527346.	153260.	402.	3.65*	4.52*
AEA	N10	PERKIOMEN VALLEY	COLLEGEVILLE	PA	524507.	129302.	524.	2.43	4.34
AEA	DUJ	DU BOIS-JEFFERSON COUNTY	DU BOIS	PA	445567.	172018.	512.	1.56	4.10
AEA	3G2	WASHINGTON COUNTY	WASHINGTON	PA	411433.	186666.	371.	3.27*	3.97*
AEA	N57	THE NEW GARDEN FLYING FLD	TOUGHKENAMON	PA	436355.	106074.	398.	2.31	3.60
AEA	UKT	QUAKERTOWN	QUAKERTOWN	PA	370687.	168623.	360.	2.44	3.58
AEA	BFD	BRADFORD REGIONAL	BRADFORD	PA	387965.	151560.	447.	1.27	3.58
AEA	N88	DOYLESTOWN	DOYLESTOWN	PA	375123.	159302.	328.	2.41	3.55
AEA	N34	TURNER FIELD	PROSPECTVILLE	PA	338315.	194751.	137.	3.16	3.54
AEA	THV	YORK	YORK	PA	419625.	113334.	413.	2.79*	3.54*
AEA	A00	ALTOONA-BLAIR COUNTY	ALTOONA	PA	363102.	166138.	391.	3.19*	3.52*
AEA	N46	POTTSTOWN LIMERICK	POTTSTOWN	PA	270734.	165034.	186.	2.42*	2.90*
AEA	N47	POTTSTOWN MUNI	POTTSTOWN	PA	239879.	147251.	235.	1.94*	2.57*
AEA	N43	EASTON	EASTON	PA	264348.	118418.	238.	1.78*	2.54*
AEA	FKL	CHESS-LAMBERTON	FRANKLIN	PA	227968.	139665.	248.	0.98	2.44
AEA	2G7	NEW CASTLE MUNI	NEW CASTLE	PA	289890.	76468.	247.	1.91*	2.43*
AEA	2G9	SOMERSET COUNTY	SOMERSET	PA	264440.	86029.	277.	1.07	2.33
AEA	2G6	PORT MEADVILLE	MEADVILLE	PA	175753.	117245.	178.	0.91	1.95
AEA	HZL	HAZLETON MUNI	HAZLETON	PA	197516.	84497.	194.	1.19	1.87
AEA	8G4	CAMPBELL	PITTSBURGH	PA	212331.	63358.	200.	0.94	1.83
AEA	PSB	MID-STATE	PHILIPSBURG	PA	137727.	127486.	145.	1.12	1.76
AEA	UNV	UNIVERSITY PARK	STATE COLLEGE	PA	100650.	138214.	0.	1.50	1.59
AEA	MPO	POCONO MOUNTAINS MUNI	MT POCONO	PA	156764.	78615.	146.	1.14	1.56
AEA	N65	3-M	BRISTOL	PA	140062.	84782.	101.	1.10*	1.49*
AEA	LHV	W T PIPER MEML	LOCK HAVEN	PA	156793.	51178.	0.	1.62	1.38

AEA	SEG	PENN VALLEY	SELINSGROVE	PA	111315.	81234.	97.	0.91*	1.28*
AEA	N30	CHERRY RIDGE	HONESDALE	PA	155675.	35685.	130.	1.01*	1.27*
AEA	4G0	PITTSBURGH-MONROEVILLE	MONROEVILLE	PA	119447.	63838.	0.	1.33	1.22
AEA	8G5	ST MARYS MUNI	ST MARYS	PA	127411.	41174.	132.	0.63	1.12
AEA	IDI	INDIANA COUNTY/JIMMY STEWART FLD/	INDIANA	PA	46984.	120702.	0.	1.38	1.11
AEA	N27	TOWANDA	TOWANDA	PA	37009.	111833.	67.	0.96	0.99
AEA	W3W	WILKES-BARRE WYOMING VALLEY	WILKES-BARRE	PA	67498.	81998.	0.	0.92	0.99
AEA	N68	CHAMBERSBURG MUNICIPAL	CHAMBERSBURG	PA	91644.	52989.	85.	0.75*	0.96*
AEA	5G8	PITTSBURGH BOQUET AIRPARK	JEANNETTE	PA	106070.	37108.	0.	1.11	0.95
AEA	8G7	ZELIENOPLE MUNICIPAL	ZELIENOPLE	PA	101423.	38412.	0.	0.88	0.93
AEA	RVL	MIFFLIN COUNTY	REEDSVILLE	PA	71841.	65547.	51.	0.70*	0.91*
AEA	2G3	CONNELLSVILLE	CONNELLSVILLE	PA	100642.	33959.	1.	1.67	0.89
AEA	9N1	VANSANT	ERWINNA	PA	98887.	32284.	0.	0.99	0.87
AEA	4G1	GREENVILLE MUNI	GREENVILLE	PA	106493.	24195.	69.	0.76*	0.87*
AEA	8G2	LAWRENCE	CORRY	PA	95785.	29153.	94.	0.39	0.83
AEA	9G8	EBENSBURG	EBENSBURG	PA	97116.	21238.	68.	0.67*	0.79*
AEA	N99	BRANDYWINE	WEST CHESTER	PA	84628.	30583.	0.	0.89	0.77
AEA	6G1	TITUSVILLE	TITUSVILLE	PA	98454.	17289.	97.	0.62*	0.77*
AEA	N70	PENNRIDGE	PERKASIE	PA	73766.	32360.	0.	0.79	0.71
AEA	8N9	WARRINGTON	DOYLESTOWN	PA	179.	105422.	0.	0.51	0.70
AEA	WAY	GREENE COUNTY	WAYNESBURG	PA	74861.	24435.	0.	0.78	0.66
AEA	4G9	BEDFORD	BEDFORD	PA	13375.	59524.	0.	0.32	0.48
AEA	ZER	SCHUYLKILL COUNTY /JOE ZERBEY/	POTTSVILLE	PA	55384.	15638.	48.	0.36*	0.47*
AEA	N29	HERSHEY AIR PARK	HERSHEY	PA	47594.	19791.	45.	0.33*	0.45*
AEA	G07	MOUNT PLEASANT-SCOTTDALE	MOUNT PLEASANT	PA	49313.	16098.	0.	0.51	0.43
AEA	N31	KUTZTOWN AIRPARK	KUTZTOWN	PA	45713.	16030.	0.	0.46	0.41
AEA	N54	BUEHL FIELD	LANGHORNE	PA	43943.	14663.	30.	0.31	0.39
AEA	9G1	WEST PENN	TARENTUM	PA	37948.	17328.	0.	0.41	0.37
AEA	N94	CARLISLE	CARLISLE	PA	39084.	12758.	0.	0.41	0.34
AEA	29D	GROVE CITY	GROVE CITY	PA	29793.	21650.	0.	0.80	0.34
AEA	N38	GRAND CANYON STATE	WELLSBORO	PA	41701.	7305.	41.	0.26*	0.33*
AEA	N13	BLOOMSBURG MUNI	BLOOMSBURG	PA	20459.	24644.	0.	0.72	0.30
AEA	G05	FINLEYVILLE	FINLEYVILLE	PA	31386.	10245.	0.	0.33	0.28
AEA	3G1	ERIE COUNTY	WATTSBURG	PA	31092.	10150.	0.	0.31	0.27
AEA	6W6	HANOVER	HANOVER	PA	24342.	16230.	0.	0.27	0.27
AEA	N76	MILLARD	ANNVILLE	PA	10407.	28292.	0.	0.20	0.26
AEA	PA21	WEST MIDDLESEX	WEST MIDDLESEX	PA	29616.	9669.	0.	0.30	0.26
AEA	N79	NORTHUMBERLAND COUNTY	SHAMOKIN	PA	9329.	27929.	0.	0.29	0.25
AEA	N96	BELLEFONTE SKYPARK	BELLEFONTE	PA	7009.	29867.	0.	0.17	0.25
AEA	N74	PENNS CAVE	CENTRE HALL	PA	7525.	30036.	0.	0.17	0.25
AEA	3G9	BUTLER FARM SHOW	BUTLER	PA	28688.	9365.	0.	0.29	0.25
AEA	11D	CLARION COUNTY	CLARION	PA	9947.	23143.	0.	0.18	0.22
AEA	N97	CLEARFIELD-LAWRENCE	CLEARFIELD	PA	26835.	7027.	21.	0.16	0.22
AEA	N53	STROUDSBURG-POCONO AIRPARK	EAST STROUDSBURG	PA	24157.	4845.	20.	0.16*	0.19*
AEA	22N	CARBON COUNTY	LEHIGHTON	PA	18717.	10363.	33.	0.30	0.19
AEA	31D	INTER COUNTY	IRWIN	PA	20749.	6774.	0.	0.21	0.18
AEA	7N8	BUTTER VALLEY GOLF PORT	BALLY	PA	18963.	6189.	0.	0.19	0.17
AEA	2W7	DEVENER	HANOVER	PA	19153.	6253.	0.	0.20	0.17
AEA	76N	SKYHAVEN	TUNKHANNOCK	PA	12380.	12324.	0.	0.15	0.16
AEA	6W7	BATTLEFIELD	GETTYSBURG	PA	16109.	5260.	0.	0.16	0.14
AEA	57N	OXFORD	OXFORD	PA	15528.	5069.	0.	0.16	0.14
AEA	7G3	LEECHBURG	LEECHBURG	PA	14370.	4692.	0.	0.14	0.13
AEA	N71	ELIZABETHTOWN-MARIETTA INC	MT JOY /MARIETTA/	PA	14625.	4773.	0.	0.15	0.13
AEA	W05	DOERSOM	GETTYSBURG	PA	15035.	4909.	0.	0.15	0.13
AEA	9W8	BAUBLITZ COMMERCIAL	BROGUE	PA	14534.	4745.	0.	0.15	0.13
AEA	9N3	SEAMANS FLD	FACTORYVILLE	PA	9163.	8507.	0.	0.11	0.12
AEA	SCE	STATE COLLEGE AIR DEPOT	STATE COLLEGE	PA	14311.	2722.	13.	0.04*	0.11*
AEA	22D	BANDEL	EIGHTY FOUR	PA	10100.	5506.	0.	0.11	0.10
AEA	89N	CENTRAL MANOR	MOUNTVILLE	PA	11476.	3747.	0.	0.12	0.10
AEA	26D	KEYSTONE PARK	EMPORIUM	PA	9975.	3256.	0.	0.10	0.09

AEA	N16	CENTRE AIRPARK	CENTRE HALL	PA	8617.	2813.	0.	0.09	0.08
AEA	G06	MC VILLE	FREEPORT	PA	8860.	2893.	0.	0.09	0.08
AEA	N35	PUNXSUTAWNEY	PUNXSUTAWNEY	PA	9067.	2960.	0.	0.09	0.08
AEA	PA11	BROKENSTRAW	PITTSFIELD	PA	7783.	4749.	0.	0.09	0.08
AEA	PA22	HERMITAGE	SHARON	PA	8755.	2858.	0.	0.09	0.08
AEA	PA23	MIFFLINTOWN	MIFFLINTOWN	PA	8445.	3301.	0.	0.09	0.08
AEA	07N	BERMUDIAN VALLEY AIRPARK	KRALLTOWN	PA	8842.	2886.	0.	0.09	0.08
AEA	PA08	MOORHEAD AIRPARK	NORTH EAST	PA	7922.	2586.	0.	0.08	0.07
AEA	69N	SLATINGTON	SLATINGTON	PA	8034.	2622.	0.	0.08	0.07
AEA	PA17	SENECA AIRPARK INC	SENECA	PA	7158.	2337.	0.	0.07	0.06
AEA	N42	SHIPPENSBURG	SHIPPENSBURG	PA	6882.	2247.	0.	0.07	0.06
AEA	N32	BLUE SWAN	SAYRE	PA	5917.	1932.	0.	0.06	0.05
AEA	8N8	DANVILLE	DANVILLE	PA	5968.	1948.	0.	0.06	0.05
AEA	7G4	BLUE KNOB VALLEY	NEWRY	PA	5508.	1798.	0.	0.06	0.05
AEA	PA06	LAKEHILL	MARS	PA	6110.	1995.	0.	0.06	0.05
AEA	9N9	HALLSTEAD	HALLSTEAD	PA	1429.	3005.	0.	0.02	0.03
AEA	1N3	ALBERT	PHILIPSBURG	PA	3699.	1208.	0.	0.04	0.03
AEA	42N	LEBANON VALLEY AIRPARK	MYERSTOWN	PA	2974.	971.	0.	0.03	0.03
AEA	74N	BENDIGO	TOWER CITY	PA	3694.	1206.	0.	0.04	0.03
AEA	70N	SPRING HILL AIRPARK	STERLING	PA	2154.	703.	0.	0.02	0.02
AEA	8N6	CARBONDALE-CLIFFORD	CARBONDALE	PA	1798.	587.	0.	0.02	0.02
AEA	71N	SUNBURY	SUNBURY	PA	1623.	530.	0.	0.02	0.01
AEA	7SP	SEVEN SPRINGS	SEVEN SPRINGS BOROUGH	PA	0.	76.	0.	0.00	0.00
AEA	W09	LEESBURG MUNI/GODFREY/FIELD	LEESBURG	VA	1066712.	197364.	907.	7.71	8.40
AEA	W98	CHESTERFIELD COUNTY	CHESTERFIELD	VA	934683.	183265.	905.	5.20	7.43
AEA	W07	SHANNON	FREDERICKSBURG	VA	656279.	196520.	604.	4.57	5.67
AEA	SHD	SHENANDOAH VALLEY	STAUNTON/WAYNESB/HARRI	VA	527132.	191875.	544.	3.36	4.78
AEA	W10	MANASSAS MUNI/HARRY P DAVIS FIELD	MANASSAS	VA	346883.	208016.	0.	13.54	3.69
AEA	LNP	LONESOME PINE	WISE	VA	218198.	139998.	212.	1.62	2.38
AEA	MFV	ACCOMACK COUNTY	MELFA	VA	282814.	72845.	276.	1.81	2.36
AEA	W83	HANOVER COUNTY MUNI	ASHLAND	VA	224220.	65403.	175.	2.05	1.92
AEA	PVG	CHESAPEAKE PORTSMOUTH	PORTSMOUTH	VA	168447.	112262.	0.	6.60	1.87
AEA	FKN	FRANKLIN MUNI-JOHN BEVERLY ROSE	FRANKLIN	VA	235048.	46088.	232.	1.91	1.87
AEA	W66	WARRENTON-FAUQUIER	MIDLAND	VA	197444.	63401.	131.	1.49	1.73
AEA	PTB	PETERSBURG MUNI	PETERSBURG	VA	219761.	36756.	210.	1.06	1.70
AEA	W70	WILLIAMSBURG-JAMESTOWN	WILLIAMSBURG/JAMESTOWN	VA	152579.	78456.	0.	5.28	1.54
AEA	PSK	NEW RIVER VALLEY	DUBLIN	VA	135323.	83348.	126.	0.85	1.45
AEA	DAN	DANVILLE MUNI	DANVILLE	VA	147224.	59486.	0.	1.32	1.37
AEA	HSP	INGALLS FIELD	HOT SPRINGS	VA	98468.	79907.	84.	0.88	1.19
AEA	W89	HOPEWELL	HOPEWELL	VA	151314.	25898.	141.	0.88	1.18
AEA	W22	WOODBRIDGE	WOODBRIDGE	VA	122746.	48470.	0.	1.23	1.14
AEA	5A1	MOUNTAIN EMPIRE	MARION/WYTHEVILLE	VA	110282.	59134.	99.	0.75*	1.13*
AEA	5FQ	SUFFOLK MUNI	SUFFOLK	VA	54441.	113941.	0.	1.91	1.12
AEA	GVE	GORDONSVILLE MUNI	GORDONSVILLE	VA	129155.	27884.	122.	0.88*	1.04*
AEA	W16	WINCHESTER MUNI	WINCHESTER	VA	70936.	53874.	0.	1.92	0.83
AEA	W92	SKY BRYCE	BASYE	VA	27592.	86719.	0.	0.52	0.76
AEA	6A8	VIRGINIA HIGHLANDS	ABINGDON	VA	37284.	68987.	0.	1.24	0.71
AEA	W13	WAYNESBORO	WAYNESBORO	VA	14565.	86528.	0.	0.41	0.67
AEA	TGI	TANGIER ISLAND	TANGIER	VA	20519.	74562.	0.	0.41	0.63
AEA	W49	CULPEPER MUNI T.I.MARTIN FIELD	CULPEPER	VA	52338.	31428.	0.	1.39	0.56
AEA	W93	ORANGE COUNTY	ORANGE	VA	42056.	42382.	0.	0.50	0.56
[illegible]	W97	WEST POINT MUNI	WEST POINT	VA	56980.	20807.	53.	0.42*	0.52*
[illegible]	[illegible]	V P I	BLACKSBURG	VA	28051.	46724.	0.	1.34	0.50
[illegible]	[illegible]	FALWELL	LYNCHBURG	VA	14253.	59538.	0.	0.31	0.49
[illegible]	[illegible]	WILLIAM M TUCK	SOUTH BOSTON	VA	30219.	37875.	0.	0.98	0.45
[illegible]	[illegible]	SMITH MOUNTAIN LAKE	MONETA	VA	15602.	50286.	0.	0.29	0.44
[illegible]	[illegible]	SOUTH NORFOLK	CHESAPEAKE	VA	48306.	15768.	0.	0.47	0.43
[illegible]	[illegible]	EMPORIA MUNI	EMPORIA	VA	25093.	37489.	0.	1.12	0.42
[illegible]	[illegible]	BLUE RIDGE	MARTINSVILLE	VA	40123.	22741.	135.	0.94	0.42

AD-A135 674 ESTABLISHMENT AND DISCONTINUANCE CRITERIA FOR AUTOMATED WEATHER OBSERVING SYSTEMS (AWOS)(U) FEDERAL AVIATION ADMINISTRATION WASHINGTON DC OFFICE OF AVIAT.. 2/2

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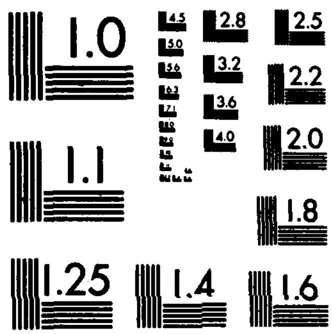
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AEA	W90	NEW LONDON	FOREST	VA	41991.	13708.	0.	0.40	0.37
AEA	GDY	GRUNDY MUNI	GRUNDY	VA	25629.	22417.	0.	0.29	0.32
AEA	FRR	FRONT ROYAL-WARREN COUNTY	FRONT ROYAL	VA	31909.	16198.	0.	0.33	0.32
AEA	BKT	ALLEN PERKINSON MUNI	BLACKSTONE	VA	26359.	11400.	0.	0.30	0.25
AEA	7A4	RICHLANDS MUNI	RICHLANDS	VA	23390.	13420.	0.	0.25	0.24
AEA	W57	GLOUCESTER	GLOUCESTER	VA	20683.	6749.	0.	1.08	0.18
AEA	W96	NEW KENT COUNTY	QUINTON	VA	12583.	12642.	0.	0.15	0.17
AEA	FVX	FARMVILLE MUNI	FARMVILLE	VA	10039.	14454.	0.	0.13	0.16
AEA	AKQ	WAKEFIELD MUNI	WAKEFIELD	VA	18256.	5957.	0.	0.88	0.16
AEA	VBW	BRIDGEWATER AIR PARK	BRIDGEWATER	VA	16004.	5224.	0.	0.15	0.14
AEA	8W2	NEW MARKET	NEW MARKET	VA	8717.	12267.	0.	0.11	0.14
AEA	W81	CREWE MUNI	CREWE	VA	14625.	4773.	0.	0.15	0.13
AEA	W45	LURAY CAVERNS	LURAY	VA	12036.	5635.	2.	0.52	0.12
AEA	PTG	LEE COUNTY	PENNINGTON GAP	VA	5768.	7680.	0.	0.20	0.09
AEA	HLX	TWIN COUNTY	GALAX/HILLSVILLE	VA	7363.	2403.	0.	0.22	0.06
AEA	LVL	LAWRENCEVILLE/BRUNSWICK MUNI	LAWRENCEVILLE	VA	5971.	1949.	0.	0.29	0.05
AEA	W31	LUNENBURG COUNTY	KENBRIDGE	VA	2762.	3699.	0.	0.04	0.04
AEA	BLF	MERCER COUNTY	BLUEFIELD	WV	516035.	187907.	535.	2.25	4.68
AEA	MRB	EASTERN WEST VIRGINIA REGIONAL ARPT	MARTINSBURG	WV	338940.	154776.	329.	2.64*	3.28*
AEA	SSU	GREENBRIER	WHITE SULPHUR SPRINGS	WV	303597.	155689.	296.	2.54*	3.05*
AEA	W67	BUCKHANNON-UPSHUR COUNTY	BUCKHANNON	WV	42789.	119328.	0.	0.93	1.08
AEA	I07	SUMMERSVILLE	SUMMERSVILLE	WV	26128.	113892.	0.	1.37	0.93
AEA	3I2	MASON COUNTY	POINT PLEASANT	WV	71175.	34531.	62.	0.49*	0.70*
AEA	I16	KEE FLD	PINEVILLE	WV	73835.	21370.	50.	0.51*	0.63*
AEA	4I0	MINGO COUNTY	WILLIAMSON	WV	15715.	63033.	0.	0.36	0.52
AEA	48I	BRAXTON COUNTY	SUTTON	WV	11930.	56869.	0.	0.29	0.46
AEA	I18	JACKSON COUNTY	RAVENSWOOD	WV	4966.	57331.	0.	0.24	0.41
AEA	W99	GRANT COUNTY	PETERSBURG	WV	23725.	23545.	0.	0.30	0.31
AEA	4G7	FAIRMONT MUNI	FAIRMONT	WV	21292.	7455.	13.	0.16*	0.19*
AEA	I94	MCDONALD FIELD	TAPLIN	WV	3795.	23523.	0.	0.11	0.18
AEA	W59	HINTON-ALDERSON	PENCE SPRINGS	WV	7235.	19092.	0.	0.13	0.18
AEA	7G1	HERRON	NEW CUMBERLAND	WV	18100.	5909.	0.	0.18	0.16
AEA	74D	MARSHALL COUNTY	MOUNDSVILLE	WV	7906.	9327.	0.	0.10	0.11
AEA	W35	POTOMAC AIRPARK	BERKELEY SPRINGS	WV	12075.	2070.	11.	0.09*	0.09*
AEA	I41	ROBERT NEWLON FLD	HUNTINGTON	WV	8657.	2826.	0.	0.09	0.08
AEA	I13	NEW RIVER GORGE	LANSING	WV	6365.	2078.	0.	0.06	0.06
AEA	I25	WELCH MUNI	WELCH	WV	6783.	2215.	0.	0.07	0.06
AEA	55I	SLATE RUN	SPENCER	WV	5169.	2801.	0.	0.06	0.05
AEA	I89	FAYETTE	FAYETTEVILLE	WV	0.	5792.	0.	0.02	0.04

GREAT LAKES REGION

AGL	UGN	WAUKEGAN MEMORIAL	WAUKEGAN	IL	2174053.	465236.	2252.	10.11	17.54
AGL	LOT	LEWIS UNIVERITY	ROMBOVILLE	IL	1982273.	385352.	2009.	10.20	15.73
AGL	JOT	JOLIET MUNI	JOLIET	IL	1195687.	273011.	1260.	6.62	9.76
AGL	UIN	QUINCY MUNI BALDWIN FIELD	QUINCY	IL	1007667.	268312.	1088.	6.17	8.48
AGL	MVN	MT VERNON-OUTLAND	MT VERNON	IL	928502.	248997.	1058.	6.10	7.82
AGL	IKK	GREATER KANKAKEE	KANKAKEE	IL	828557.	154896.	865.	4.04	6.53
AGL	C06	ELGIN	ELGIN	IL	694207.	228636.	623.	4.35	6.13
AGL	LWV	LAWRENCEVILLE-VINCENNES MUNI	LAWRENCEVILLE	IL	725586.	167027.	721.	4.79	5.93
AGL	MTO	COLES COUNTY MEMORIAL	MATTOON-CHARLESTON	IL	681951.	201816.	719.	3.57	5.87
AGL	3HA	LANSING MUNICIPAL	CHICAGO	IL	610105.	216021.	553.	4.08*	5.49*
AGL	C18	FRANKFORT	FRANKFORT	IL	680957.	130450.	723.	3.03	5.39
AGL	3CK	CRYSTAL LAKE	CRYSTAL LAKE	IL	554221.	203193.	455.	3.31	5.03
AGL	C81	CAMPBELL	GRAYSLAKE	IL	586917.	120497.	547.	3.58*	4.70*
AGL	C16	ILLINI	URBANA	IL	489226.	164880.	446.	3.36*	4.35*
AGL	SQI	WHITESIDE CO ARPT-JOS H BITTORF FLD	STERLING ROCKFALLS	IL	357599.	165446.	376.	2.19	3.48

AGL	3MY	MOUNT HAWLEY AUXILIARY	PEORIA	IL	389396.	117939.	382.	2.66*	3.37*
AGL	C77	BELVIDERE LTD	BELVIDERE	IL	316982.	156924.	290.	2.25*	3.15*
AGL	C56	SANGER	MONEE	IL	397725.	71510.	393.	2.45	3.12
AGL	10C	GALT FIELD	GREENWOOD/WONDER LAKE	IL	327421.	118153.	310.	2.27*	2.96*
AGL	SLO	SALEM-LECKRONE	SALEM	IL	275834.	121688.	270.	2.13	2.64
AGL	ENL	CENTRALIA MUNI	CENTRALIA	IL	271574.	123770.	280.	1.82	2.63
AGL	1C5	CLOW INTL	PLAINFIELD	IL	235867.	149355.	0.	2.66	2.56
AGL	RSV	ROBINSON MUNI	ROBINSON	IL	301957.	80488.	312.	2.12	2.54
AGL	FEP	THE ALBERTUS	FREEPORT	IL	298911.	69176.	308.	1.61	2.45
AGL	12C	ROCHELLE MUN	ROCHELLE	IL	280115.	58893.	280.	1.84*	2.25*
AGL	IJX	JACKSONVILLE MUNI	JACKSONVILLE	IL	179372.	139787.	160.	1.65	2.12
AGL	3HW	HOWELL	CHICAGO/BLUE ISLAND/	IL	162755.	146188.	0.	2.00	2.05
AGL	C73	DIXON MUNI-CHARLES R. WALGREEN FIELD	DIXON	IL	230479.	57254.	229.	1.53*	1.91*
AGL	C09	MORRIS MUNI	MORRIS	IL	167859.	87846.	165.	1.27*	1.70*
AGL	C15	PEKIN MUNI	PEKIN	IL	102975.	138976.	0.	3.65	1.61
AGL	C45	WADDELL	MANITO	IL	198624.	35511.	195.	1.26*	1.56*
AGL	OLY	OLNEY-NOBLE	OLNEY-NOBLE	IL	115632.	114319.	109.	1.21	1.53
AGL	06C	CHICAGO/SCHAUMBURG	CHICAGO/SCHAUMBURG	IL	100005.	125712.	0.	1.41	1.50
AGL	HSB	HARRISBURG-RALEIGH	HARRISBURG	IL	159000.	62836.	152.	1.35	1.47
AGL	3LC	LOGAN COUNTY	LINCOLN	IL	163524.	43793.	160.	1.10	1.38
AGL	0C0	DACY	HARVARD	IL	149915.	48935.	0.	1.59	1.32
AGL	SAR	SPARTA COMMUNITY-HUNTER FIELD	SPARTA	IL	138244.	52038.	0.	0.32	1.26
AGI	3K6	SHAFER METRO EAST	ST JACOB	IL	107610.	68335.	0.	1.21	1.17
AGL	2H3	FAIRFIELD MUNI	FAIRFIELD	IL	128616.	35124.	110.	0.90	1.09
AGL	1H8	CASEY MUNI	CASEY	IL	102893.	46905.	72.	0.82	1.00
AGL	C75	MARSHALL COUNTY	LACON	IL	116265.	25376.	115.	0.77*	0.94*
AGL	2H0	SHELBY COUNTY	SHELBYVILLE	IL	38161.	70368.	0.	0.62	0.72
AGL	1M0	CAIRO	CAIRO	IL	24310.	83144.	0.	0.54	0.71
AGL	VLA	VANDALIA MUNI	VANDALIA	IL	81966.	24263.	80.	0.59	0.71
AGL	MQB	MACOMB MUNICIPAL	MACOMB	IL	40309.	55485.	0.	1.36	0.64
AGL	GRE	GREENVILLE	GREENVILLE	IL	64720.	26883.	58.	0.64	0.61
AGL	C80	WAGON WHEEL	ROCKTON	IL	66705.	24010.	66.	0.47*	0.60*
AGL	DKB	DEKALB MUNI	DEKALB	IL	56776.	31841.	0.	0.62	0.59
AGL	C34	GIBSON CITY MUNI	GIBSON CITY	IL	71729.	12824.	70.	0.45*	0.56*
AGL	C66	MONMOUTH MUNICIPAL	MONMOUTH	IL	28680.	55193.	0.	1.05	0.56
AGL	C48	SANDWICH	SANDWICH	IL	57079.	18632.	0.	0.58	0.50
AGL	C07	KEWANEE MUNI	KEWANEE	IL	32111.	39382.	0.	1.09	0.48
AGL	PRG	EDGAR COUNTY	PARIS	IL	25501.	46979.	0.	1.06	0.48
AGL	CTK	INGERSOLL	CANTON	IL	36595.	29345.	0.	1.18	0.44
AGL	H07	HIGHLAND-WINET	HIGHLAND	IL	44022.	19160.	0.	0.49	0.42
AGL	1H2	EFFINGHAM COUNTY MEMORIAL	EFFINGHAM	IL	28590.	33418.	0.	0.96	0.41
AGL	M30	METROPOLIS MUNI	METROPOLIS	IL	18826.	39917.	0.	0.33	0.39
AGL	3LF	LITCHFIELD MUNI	LITCHFIELD	IL	30027.	29065.	0.	0.39	0.39
AGL	PPQ	PITTSFIELD PENSTONE MUNICIPAL	PITTSFIELD	IL	19708.	35671.	0.	0.78	0.37
AGL	C13	OTTAWA	OTTAWA	IL	28087.	26515.	0.	0.35	0.36
AGL	1C8	COTTONWOOD	ROCKFORD	IL	25076.	27450.	0.	0.34	0.35
AGL	C95	WOODS FIELD	EAST MOLINE	IL	38051.	12420.	0.	0.39	0.34
AGL	CUL	CARMI MUNI	CARMI	IL	36163.	11803.	0.	1.37	0.32
AGL	H96	BENTON MUNI	BENTON	IL	29519.	17622.	0.	0.33	0.31
AGL	C54	VALLEY	SPRING VALLEY	IL	13292.	31400.	0.	0.24	0.30
AGL	DTG	DWIGHT	DWIGHT	IL	24591.	16014.	0.	0.28	0.27
AGL	STQ	ROWE AVIATION	STREATOR	IL	15015.	26186.	0.	0.23	0.27
AGL	K06	GREATER BEARDSTOWN	BEARDSTOWN	IL	16450.	15008.	0.	0.21	0.21
AGL	3TV	TAYLORVILLE MUNI	TAYLORVILLE	IL	20638.	10959.	0.	0.23	0.21
AGL	C82	BRESSON AIRPORT	COMPTON	IL	16642.	13419.	0.	0.20	0.20
AGL	C41	PIPER	PRINCETON	IL	15503.	13048.	0.	0.19	0.19
AGL	79IL	MILFORD	MILFORD	IL	13387.	15012.	0.	0.17	0.19
AGL	1C2	NEW LENOX-HOWELL	NEW LENOX	IL	18015.	11202.	0.	0.20	0.19
AGL	3KK	KANKAKEE	KANKAKEE	IL	20537.	6704.	0.	0.22	0.18
AGL	C00	MERCER COUNTY	ALEDO	IL	16006.	9976.	0.	0.19	0.17

AGL	H84	FLORA MUNI	FLORA	IL	6853.	16713.	0.	0.26	0.16
AGL	0C3	WILHELMI FIELD	JOLIET	IL	15458.	5046.	0.	0.16	0.14
AGL	0C8	SPOHNHOLTZ	NEWARK	IL	13374.	4366.	0.	0.14	0.12
AGL	I02	MT CARMEL MUNI	MT CARMEL	IL	11018.	6100.	0.	0.13	0.11
AGL	K96	TUSCOLA	TUSCOLA	IL	9806.	3201.	0.	0.10	0.09
AGL	0C7	GRANDPAS' FARM MENDOTA	MENDOTA	IL	4097.	5336.	0.	0.06	0.06
AGL	C51	HAVANA	HAVANA	IL	4757.	1553.	0.	0.05	0.04
AGL	BDF	RINKENBERGER	BRADFORD	IL	1089.	355.	0.	0.01	0.01
AGL	VPZ	PORTER COUNTY MUNI	VALPARAISO	IN	1417583.	297272.	1531.	6.41	11.39
AGL	GYY	GARY MUNI	GARY	IN	1229950.	210965.	1207.	8.32*	9.57*
AGL	EKM	ELKHART MUNI	ELKHART	IN	798441.	239728.	837.	6.05*	6.90*
AGL	BAK	COLUMBUS BAKALAR MUNI	COLUMBUS	IN	774227.	235313.	848.	3.78	6.71
AGL	OKK	KOKOMO MUNI	KOKOMO	IN	618219.	208087.	641.	3.26	5.49
AGL	RID	RICHMOND MUNI	RICHMOND	IN	614603.	132012.	634.	3.44	4.96
AGL	4I8	INDIANAPOLIS METROPOLITAN	INDIANAPOLIS	IN	483706.	186857.	498.	3.25	4.46
AGL	C65	PLYMOUTH MUNI	PLYMOUTH	IN	458425.	182150.	475.	2.32	4.26
AGL	AID	ANDERSON MUNI	ANDERSON	IN	405621.	174114.	415.	3.35*	3.85*
AGL	MZZ	MARION MUNI	MARION	IN	372994.	165982.	386.	2.17	3.58
AGL	3FK	FRANKLIN	FRANKLIN	IN	364398.	169867.	356.	2.74*	3.55*
AGL	GSH	GOSHEN MUNI	GOSHEN	IN	390617.	90464.	405.	1.69	3.20
AGL	SMD	SMITH FIELD	FORT WAYNE	IN	316569.	150902.	303.	1.88	3.11
AGL	05C	GRIFFITH	GRIFFITH	IN	326930.	100868.	331.	1.84	2.84
AGL	MGC	MICHIGAN CITY	MICHIGAN CITY	IN	229687.	143404.	240.	1.57	2.48
AGL	I22	RANDOLPH COUNTY	WINCHESTER	IN	223887.	144530.	220.	1.81*	2.45*
AGL	5I1	SKYWAY	GREENWOOD	IN	222118.	144660.	208.	1.80*	2.44*
AGL	BFR	VIRGIL I GRISSOM MUNI	BEDFORD	IN	240759.	115584.	245.	1.80	2.37
AGL	ANQ	TRI-STATE STEUBEN COUNTY	ANGOLA	IN	230719.	115570.	224.	1.81	2.30
AGL	UWL	NEW CASTLE-HENRY CO. MUNI.	NEW CASTLE	IN	242307.	81943.	245.	1.22	2.15
AGL	03C	HUNTINGTON MUNI	HUNTINGTON	IN	262322.	53394.	260.	1.70*	2.10*
AGL	ASW	WARSAW MUNI	WARSAW	IN	222318.	87071.	230.	1.21	2.06
AGL	C39	MICHIGAN CITY MUNI	MICHIGAN CITY	IN	260439.	43003.	299.	1.41	2.02
AGL	3I3	SKY KING	TERRE HAUTE	IN	191237.	111849.	164.	1.48*	2.01*
AGL	3SM	SHELBYVILLE MUNI	SHELBYVILLE	IN	226634.	68962.	221.	1.27	1.96
AGL	I14	EAGLE CREEK AIRPARK	INDIANAPOLIS	IN	139210.	150801.	0.	5.41	1.93
AGL	C62	KENDALLVILLE MUNI	KENDALLVILLE	IN	199732.	86388.	186.	1.41*	1.90*
AGL	RCR	FULTON COUNTY	ROCHESTER	IN	210870.	42517.	216.	1.24	1.68
AGL	CFJ	CRAWFORDSVILLE MUNI	CRAWFORDSVILLE	IN	203264.	40383.	202.	1.15	1.62
AGL	SER	FREEMAN MUNI	SEYMOUR	IN	110977.	126450.	99.	1.44	1.58
AGL	IWH	WABASH MUNI	WABASH	IN	164497.	53249.	166.	1.01	1.45
AGL	CEV	METTEL FIELD	CONNERSVILLE	IN	124325.	83296.	110.	1.08	1.41
AGL	3AR	ARETZ	LAFAYETTE	IN	144029.	47018.	0.	1.51	1.27
AGL	I99	ALEXANDRIA	ALEXANDRIA	IN	151153.	28926.	141.	0.75	1.20
AGL	SIV	SULLIVAN COUNTY	SULLIVAN	IN	127688.	49086.	124.	0.86	1.17
AGL	I76	PERU MUNI	PERU	IN	135711.	35217.	133.	0.69	1.14
AGL	IMS	MADISON MUNI	MADISON	IN	112361.	57752.	89.	0.83	1.13
AGL	I21	INDIANAPOLIS BROOKSIDE AIRPARK	INDIANAPOLIS	IN	129546.	37238.	98.	0.98	1.11
AGL	4I7	PUTNAM COUNTY	GREENCASTLE	IN	128856.	23501.	122.	0.80*	1.01*
AGL	OEA	ONEAL	VINCENNES	IN	122759.	21351.	123.	0.80*	0.96*
AGL	HNB	HUNTINGBURG	HUNTINGBURG	IN	77403.	56442.	56.	0.85	0.89
AGL	MCX	WHITE COUNTY	MONTICELLO	IN	86807.	45102.	85.	0.59	0.88
AGL	I38	HAPS	JEFFERSONVILLE	IN	26990.	102668.	0.	0.65	0.86
AGL	I52	INDIANAPOLIS TERRY	INDIANAPOLIS	IN	87302.	40574.	83.	0.51	0.85
AGL	DCY	DAVIESS COUNTY	WASHINGTON	IN	84874.	27708.	0.	0.89	0.75
AGL	TEL	PERRY COUNTY MUNI	TELL CITY	IN	58069.	48779.	0.	1.57	0.71
AGL	50I	KENTLAND MUNI	KENTLAND	IN	40366.	43214.	41.	0.53*	0.69*
AGL	FRH	FRENCH LICK MUNI	FRENCH LICK	IN	62582.	41778.	55.	0.72	0.69
AGL	GGP	LOGANSPORT MUNI	LOGANSPORT	IN	47493.	44931.	0.	0.58	0.61
AGL	3SY	SPEEDWAY	INDIANAPOLIS	IN	69441.	22667.	0.	0.73	0.61
AGL	3HO	HOBART SKY RANCH	HOBART	IN	61440.	27508.	0.	0.67	0.59

AGL	I81	BROWNSBURG	BROWNSBURG	IN	57697.	21544.	0.	0.61	0.53
AGL	3LP	LAPORTE MUNI	LAPORTE	IN	34493.	40458.	35.	0.36*	0.50*
AGL	07C	AUBURN DEKALB	AUBURN	IN	40630.	34245.	25.	0.36	0.50
AGL	FKR	FRANKFORT MUNI	FRANKFORT	IN	48653.	24004.	44.	0.34	0.48
AGL	5I4	SHERIDAN	SHERIDAN	IN	16049.	54891.	0.	0.35	0.47
AGL	C98	LAKE VILLAGE	LAKE VILLAGE	IN	49553.	16175.	0.	0.52	0.44
AGL	C64	WAWASEE	SYRACUSE	IN	28194.	35976.	0.	0.38	0.43
AGL	0I2	ARTHUR MUNI	BRAZIL	IN	48310.	8667.	47.	0.29	0.38
AGL	OVO	NORTH VERNON	NORTH VERNON	IN	42784.	13968.	0.	0.45	0.38
AGL	3HM	HALSMER	LAFAYETTE	IN	34241.	22837.	21.	0.31*	0.38*
AGL	I83	SALEM MUNI	SALEM	IN	16013.	35050.	0.	0.28	0.34
AGL	C03	NAPPANEE MUNI	NAPPANEE	IN	41155.	7689.	38.	0.26*	0.32*
AGL	7I2	REESE	MUNCIE	IN	28311.	13182.	0.	0.32	0.28
AGL	7I5	HIGHLAND	PERRYSVILLE	IN	28591.	11882.	0.	0.31	0.27
AGL	3C2	SHENK	GARRETT	IN	22788.	11718.	0.	0.24	0.23
AGL	I72	WESTFIELD	WESTFIELD	IN	22501.	7345.	0.	0.23	0.20
AGL	6I4	BOONE COUNTY	LEBANON	IN	22527.	7353.	0.	0.23	0.20
AGL	3I1	ELWOOD	ELWOOD	IN	19440.	10363.	0.	0.21	0.20
AGL	RZL	JASPER COUNTY	RENSSELAER	IN	21149.	6904.	0.	0.21	0.19
AGL	PLD	STEED FLD	PORTLAND	IN	8871.	17746.	0.	0.27	0.18
AGL	4C4	ARENS FIELD	WINAMAC	IN	23468.	4237.	22.	0.15*	0.18*
AGL	6I3	RUZICKA	KOKOMO	IN	19700.	6430.	0.	0.21	0.17
AGL	7I1	KELLYS AIRFIELD	MOORESVILLE	IN	18908.	6173.	0.	0.20	0.17
AGL	C92	MENTONE	MENTONE	IN	15150.	4945.	0.	0.16	0.13
AGL	GFD	POPE FIELD	GREENFIELD	IN	13049.	4260.	0.	0.14	0.12
AGL	C40	MILLER	BLUFFTON	IN	13991.	4567.	0.	0.14	0.12
AGL	C63	NEW CASTLE MUNI	NEW CASTLE	IN	13762.	4492.	0.	0.14	0.12
AGL	3C1	MISHAWAKA PILOTS CLUB	ELKHART	IN	10819.	2914.	30.	0.20	0.09
AGL	1I3	SHAWNEE FIELD	BLOOMFIELD	IN	9898.	3231.	0.	0.10	0.09
AGL	3EV	SKYLANE	EVANSVILLE	IN	9879.	3225.	0.	0.10	0.09
AGL	I42	PAOLI MUNI	PAOLI	IN	7318.	3469.	0.	0.08	0.07
AGL	IN02	POST-AIRE	INDIANAPOLIS	IN	5655.	1846.	0.	0.06	0.05
AGL	67I	D AND R AIRPARK	RUSHVILLE	IN	4082.	1333.	0.	0.04	0.04
AGL	1I7	CLINTON	CLINTON	IN	2951.	963.	0.	0.03	0.03
AGL	1I1	JESSUP	ANDERSON	IN	2730.	891.	0.	0.03	0.02
AGL	2IN2	MT COMFORT	INDIANAPOLIS	IN	1093.	303.	0.	0.01*	0.01*
AGL	3AE	ACE AIRPARK	ANDERSON	IN	1493.	487.	0.	0.02	0.01
AGL	1D2	METTETAL	PLYMOUTH	MI	729407.	170340.	709.	4.71*	5.98*
AGL	Y70	IONIA COUNTY	IONIA	MI	560438.	179064.	591.	2.86	4.91
AGL	9D9	HASTINGS MUNI	HASTINGS	MI	591541.	132339.	624.	4.10	4.81
AGL	D92	CUSTER	MONROE	MI	512475.	186677.	540.	3.08	4.65
AGL	IMT	FORD	IRON MOUNTAIN/KINGSFOR	MI	512338.	188161.	550.	2.86	4.65
AGL	D98	ROMEO	ROMEO	MI	528660.	160606.	514.	3.54*	4.58*
AGL	3TR	JERRY TYLER MEML	NILES	MI	459840.	180788.	487.	2.32	4.26
AGL	ADG	THE LENAWEE COUNTY	ADRIAN	MI	540741.	96411.	566.	2.89	4.23
AGL	2G5	GROSSE ILE MUNI	DETROIT/GROSSE ILE	MI	518311.	112848.	369.	3.59*	4.19*
AGL	CMX	HOUGHTON COUNTY MEMORIAL	HANCOCK	MI	437813.	175751.	472.	2.02	4.08
AGL	3HE	LIVINGSTON COUNTY	HOWELL	MI	430884.	165340.	429.	2.56	3.96
AGL	4D0	ABRAMS MUNI	GRAND LEDGE	MI	492496.	85765.	316.	3.07*	3.84*
AGL	7D2	OAKLAND-TROY	TROY	MI	455087.	113131.	455.	3.04*	3.78*
AGL	0D1	SOUTH HAVEN MUNI	SOUTH HAVEN	MI	469238.	81868.	490.	2.44	3.66
AGL	GLR	OTSEGO COUNTY	GAYLORD	MI	373971.	167864.	397.	2.45	3.60
AGL	5D3	OWOSSO CITY	OWOSSO	MI	451588.	80101.	458.	2.37	3.53
AGL	PHN	ST CLAIR COUNTY INTL	PORT HURON	MI	411406.	76333.	380.	1.92	3.24
AGL	MNM	MENOMINEE-MARINETTE TWIN COUNTY	MENOMINEE	MI	323328.	159026.	341.	2.28	3.20
AGL	3CM	JAMES CLEMENTS MUNI	BAY CITY	MI	333253.	135338.	323.	2.34*	3.11*
AGL	ESC	DELTA COUNTY	ESCANABA	MI	305723.	155491.	311.	2.05	3.06
AGL	C19	TULIP CITY	HOLLAND	MI	297400.	132134.	295.	2.17*	2.85*
AGL	Y47	OAKLAND SOUTHWEST	NEW HUDSON	MI	288061.	117960.	278.	2.03*	2.70*

AGL	Y84	MACKINAC ISLAND	MACKINAC ISLAND	MI	292834.	187147.	297.	2.16*	2.66*
AGL	C91	CASS COUNTY MEML	DOWAGIAC	MI	312685.	77871.	314.	2.13*	2.59*
AGL	5G9	WAGON WHEEL	LAMBERTVILLE	MI	301285.	53913.	291.	1.88*	2.36*
AGL	0G9	SALEM	SALEM	MI	300059.	54205.	290.	1.87*	2.35*
AGL	PLN	EMMET COUNTY	PELLSTON	MI	209495.	137511.	239.	1.29	2.31
AGL	ACB	ANTRIM COUNTY	BELLAIRE	MI	199069.	139642.	201.	1.78	2.25
AGL	AMN	GRATIOT COMMUNITY	ALMA	MI	208774.	129709.	213.	1.39	2.25
AGL	5D8	BROOKS FIELD	MARSHALL	MI	262673.	53175.	279.	1.14	2.10
AGL	D95	DUPONT-LAPEER	LAPEER	MI	256557.	57312.	251.	1.65*	2.09*
AGL	Y15	CHEBOYGAN CITY-COUNTY	CHEBOYGAN	MI	179043.	134572.	209.	1.34	2.08
AGL	8D4	SPARTA	SPARTA	MI	168961.	134965.	167.	1.53*	2.02*
AGL	IWD	GOGEBIC COUNTY	IRONWOOD	MI	163351.	133637.	158.	1.61	1.98
AGL	UIZ	BERZ-MACOMB	UTICA	MI	227681.	59436.	227.	1.46	1.91
AGL	MQT	MARQUETTE COUNTY	MARQUETTE	MI	124798.	146095.	0.	1.81	1.80
AGL	MOP	MT PLEASANT MUNICIPAL	MT PLEASANT	MI	224782.	43206.	229.	1.14	1.78
AGL	MBL	MANISTEE CO.-BLACKER	MANISTEE	MI	208865.	55971.	228.	0.98	1.76
AGL	3GM	GRAND HAVEN MEML AIRPARK	GRAND HAVEN	MI	197759.	54367.	191.	1.30*	1.68*
AGL	09G	MASON JEWETT FIELD	MASON	MI	206337.	36437.	203.	1.31*	1.61*
AGL	CVX	CHARLEVOIX MUNI	CHARLEVOIX	MI	130905.	102315.	135.	0.91	1.55
AGL	07G	FITCH H BEACH	CHARLOTTE	MI	177769.	52798.	189.	0.83	1.53
AGL	35D	PADGHAM FIELD	ALLEGAN	MI	178379.	42722.	194.	0.67	1.47
AGL	3TE	AL MEYERS	TECUMSEH	MI	169613.	32857.	164.	1.07*	1.35*
AGL	CAD	WEXFORD COUNTY	CADILLAC	MI	116091.	52851.	116.	0.66	1.12
AGL	CIU	CHIPPEWA COUNTY INTERNATIONAL	SAULT STE MARIE	MI	49797.	116876.	0.	0.93	1.11
AGL	6D9	IOSCO COUNTY	EAST TAWAS	MI	137434.	24263.	135.	0.87*	1.07*
AGL	Y85	HILLSDALE MUNI	HILLSDALE	MI	134496.	24742.	132.	0.85*	1.06*
AGL	3BB	BIG BEAVER	TROY	MI	113638.	37094.	0.	1.19	1.00
AGL	6D6	GREENVILLE MUNI	GREENVILLE	MI	36416.	113912.	0.	0.82	1.00
AGL	D13	MCKINLEY	FRASER	MI	90044.	47925.	0.	1.01	0.92
AGL	77D	ROBEN-HOOD	BIG RAPIDS	MI	95737.	35848.	94.	0.67*	0.87*
AGL	3FM	FREMONT MUNI	FREMONT	MI	103962.	23008.	109.	0.46	0.84
AGL	D96	BRANCH COUNTY MEMORIAL	COLDWATER	MI	75086.	41686.	49.	0.59	0.78
AGL	ISQ	SCHOOLCRAFT COUNTY	MANISTIQUE	MI	93371.	20174.	98.	0.39	0.75
AGL	SJX	BEAVER ISLAND	ST JAMES	MI	5649.	107207.	0.	0.56	0.75
AGL	IRS	KIRSCH MUNI	STURGIS	MI	34915.	68318.	0.	1.34	0.69
AGL	Y93	ATLANTA MUNI	ATLANTA	MI	4540.	85759.	0.	0.36	0.60
AGL	3BS	JACK BARSTOW	MIDLAND	MI	67842.	22124.	1.	2.15	0.60
AGL	83D	MACKINAC COUNTY	ST IGNACE	MI	10690.	74537.	0.	0.37	0.57
AGL	ERY	LUCE COUNTY HALE	NEWBERRY	MI	59265.	16402.	50.	0.34	0.50
AGL	78D	CARO MUNI	CARO	MI	58975.	10416.	58.	0.37*	0.46*
AGL	1MI6	ROSEDALE	SAULT STE MARIE	MI	0.	63329.	0.	0.28	0.42
AGL	D87	HARBOR SPRINGS	HARBOR SPRINGS	MI	9591.	50568.	0.	0.28	0.40
AGL	35G	HARRY W. BROWNE	SAGINAW	MI	43624.	14241.	0.	1.06	0.38
AGL	57D	MACOMB	NEW HAVEN	MI	40684.	14594.	0.	0.42	0.37
AGL	76G	MARINE CITY	MARINE CITY	MI	34168.	18242.	0.	0.38	0.35
AGL	43G	LARSEN AIR PARK	BELLVILLE	MI	39838.	13020.	0.	0.41	0.35
AGL	GDW	GLADWIN	GLADWIN	MI	36186.	14314.	0.	0.39	0.34
AGL	3NP	BELFORD MAULE FIELD	NAPOLEON	MI	36883.	12039.	0.	0.38	0.33
AGL	1G4	SPENCER FIELD	WIXOM	MI	35704.	13225.	0.	0.37	0.33
AGL	76D	HURON COUNTY MEMORIAL	BAD AXE	MI	31894.	16034.	0.	0.35	0.32
AGL	HAI	THREE RIVERS MUNICIPAL DR HAINES	THREE RIVERS	MI	29355.	19042.	0.	0.98	0.32
AGL	C05	SOUTH KENT	GRAND RAPIDS	MI	35031.	11435.	0.	0.37	0.31
AGL	61D	OTSEGO-PLAINWELL MUNI	PLAINWELL	MI	34187.	11159.	0.	0.36	0.30
AGL	LDM	MASON COUNTY	LUDINGTON	MI	28477.	14171.	0.	0.87	0.28
AGL	99G	CARLS	SOUTH ROCKWOOD	MI	29744.	9709.	0.	0.30	0.26
AGL	2D8	DAVIS	EAST LANSING	MI	27724.	9049.	0.	0.28	0.24
AGL	C28	NEWAYGO	NEWAYGO	MI	18858.	17926.	0.	0.23	0.24
AGL	13C	LAKEVIEW	LAKEVIEW	MI	24434.	11566.	0.	0.27	0.24
AGL	37G	ALMONT	ALMONT	MI	23051.	10147.	0.	0.24	0.22
AGL	BFA	BOYNE MOUNTAIN	BOYNE FALLS	MI	27392.	4812.	27.	0.17*	0.21*

AGL	Y31	WEST BRANCH COMMUNITY	WEST BRANCH	MI	23557.	7689.	0.	0.79	0.21
AGL	7Y0	TIMBERS SKY CAMP	SOUTH BRANCH	MI	8327.	23633.	0.	0.16	0.21
AGL	D15	LAKE ISABELLA LANDING AREA	WEIDMAN	MI	8236.	20997.	0.	0.15	0.19
AGL	42C	WHITE CLOUD	WHITE CLOUD	MI	18244.	8458.	0.	0.20	0.18
AGL	OGM	ONTONAGON COUNTY	ONTONAGON	MI	21845.	3910.	21.	0.14*	0.17*
AGL	39C	OSELKA	THREE OAKS	MI	19033.	6213.	0.	0.19	0.17
AGL	5D7	MILAN	MILAN	MI	18493.	6036.	0.	0.19	0.16
AGL	Y83	SANDUSKY CITY	SANDUSKY	MI	15753.	7645.	0.	0.17	0.16
AGL	Y94	EAST JORDAN CITY	EAST JORDAN	MI	13090.	9502.	0.	0.15	0.15
AGL	44G	BETZ	BLISSFIELD	MI	16651.	5435.	0.	0.17	0.15
AGL	40C	WATERVLIET MUNI	WATERVLIET	MI	15303.	5779.	0.	0.16	0.14
AGL	48D	CLARE MUNI	CLARE	MI	12582.	6610.	0.	0.14	0.13
AGL	Y91	HOME ACRES SKY RANCH	LAKE CITY	MI	12992.	6303.	0.	0.14	0.13
AGL	Y17	ACME SKYPORT	ACME	MI	13386.	4633.	0.	0.14	0.12
AGL	41C	WAYLAND MUNI	WAYLAND	MI	13657.	4461.	0.	0.14	0.12
AGL	65G	MAPLE GROVE	FOWLERVILLE	MI	14104.	4604.	0.	0.14	0.12
AGL	Y66	DRUMMOND ISLAND	DRUMMOND ISLAND	MI	8469.	7640.	0.	0.11	0.11
AGL	C01	PILOT COUNTRY	COOPERSVILLE	MI	12865.	4199.	0.	0.13	0.11
AGL	45G	HYNE FIELD	BRIGHTON	MI	12795.	4178.	0.	0.13	0.11
AGL	55G	ARNOLD FIELD	CROSWELL	MI	11897.	3883.	0.	0.12	0.10
AGL	88G	GRADOLPH FLD	PETERSBURG	MI	11897.	3883.	0.	0.12	0.10
AGL	HLM	PARK TOWNSHIP	HOLLAND	MI	21.	13503.	0.	0.05*	0.09*
AGL	3D4	CITY-COUNTY	FRANKFORT	MI	3569.	7438.	0.	0.06	0.07
AGL	24C	LOWELL CITY	LOWELL	MI	8327.	2718.	0.	0.08	0.07
AGL	98G	SEBEWAING	SEBEWAING	MI	6835.	2231.	0.	0.07	0.06
AGL	RCT	MILLER FIELD	REED CITY	MI	6476.	2113.	0.	0.07	0.06
AGL	3RC	ROSCOMMON CONSERVATION	ROSCOMMON	MI	6766.	2209.	0.	0.07	0.06
AGL	80D	CLARE COUNTY	HARRISON	MI	5739.	1873.	0.	0.06	0.05
AGL	09C	AUSTIN LAKE	KALAMAZOO	MI	3749.	1224.	0.	0.04	0.03
AGL	D18	DOWNWIND ACRES	WILLIS	MI	2593.	848.	0.	0.03	0.02
AGL	ANE	ANOKA COUNTY-BLAINE ARPT(JANES FIELD)	MINNEAPOLIS	MN	1685813.	402190.	1767.	11.78*	13.87*
AGL	21D	LAKE ELMO	ST PAUL	MN	1476545.	307368.	1414.	9.32*	11.85*
AGL	D97	SOUTH ST PAUL MUNI-RICHARD E FLEMING FLD	SOUTH ST PAUL	MN	987086.	184762.	945.	6.15*	7.79*
AGL	INL	FALLS INTL	INTERNATIONAL FALLS	MN	863829.	237896.	918.	3.63	7.32
AGL	HIB	CHISHOLM-HIBBING	HIBBING	MN	707556.	215566.	834.	3.47	6.13
AGL	GPZ	GRAND RAPIDS ITASCA COUNTY	GRAND RAPIDS	MN	670368.	213486.	678.	3.41	5.87
AGL	MKT	MANKATO MUNI	MANKATO	MN	586035.	201835.	612.	3.32	5.23
AGL	BRD	BRAINERD-CROW WING CO/WALTER WIELAND FLD	BRAINERD	MN	498261.	184650.	537.	2.56	4.54
AGL	AXN	CHANDLER FIELD	ALEXANDRIA	MN	385646.	159209.	346.	2.90	3.62
AGL	OWA	OWATONNA MUNI	OWATONNA	MN	373983.	166052.	374.	2.61	3.59
AGL	PKD	PARK RAPIDS MUNI	PARK RAPIDS	MN	337899.	153153.	449.	1.61	3.26
AGL	FRM	FAIRMONT MUNI	FAIRMONT	MN	311565.	156794.	317.	1.96	3.11
AGL	TVF	THIEF RIVER FALLS REGIONAL	THIEF RIVER FALLS	MN	302662.	148123.	318.	2.01	3.00
AGL	MML	MARSHALL MUNI-RYAN FIELD	MARSHALL	MN	291604.	153489.	331.	1.99	2.96
AGL	ILL	WILLMAR MUNI	WILLMAR	MN	304939.	102477.	296.	1.76	2.71
AGL	EVM	EVELETH-VIRGINIA MUNI	EVELETH	MN	308691.	76146.	312.	1.40	2.56
AGL	BDE	BAUDETTE INTL	BAUDETTE	MN	273305.	84895.	262.	2.40	2.38
AGL	BJI	BEMIDJI MUNI	BEMIDJI	MN	202343.	139028.	186.	1.37	2.27
AGL	AEL	ALBERT LEA MUNI	ALBERT LEA	MN	191553.	109156.	166.	1.29	2.00
AGL	COQ	CLOQUET CARLTON COUNTY	CLOQUET	MN	234487.	49715.	240.	1.06	1.89
AGL	OTG	WORTHINGTON MUNI	WORTHINGTON	MN	168845.	104248.	159.	1.26	1.81
AGL	AUM	AUSTIN MUNI	AUSTIN	MN	227488.	42124.	218.	1.30	1.79
AGL	ELO	ELY MUNI	ELY	MN	168027.	98171.	165.	1.08	1.77
AGL	ULM	NEW ULM MUNI	NEW ULM	MN	132102.	127183.	134.	1.18	1.72
AGL	Y12	AIRLAKE INDUSTRIAL PARK	LAKEVILLE	MN	199689.	59371.	194.	1.38*	1.72*
AGL	ROX	ROSEAU MUNI	ROSEAU	MN	135522.	83826.	128.	0.94	1.46
AGL	BBB	BENSON MUNI	BENSON	MN	139765.	76965.	117.	1.28	1.44
AGL	LXL	LITTLE FALLS-MORRISON COUNTY	LITTLE FALLS	MN	159452.	45008.	191.	1.30	1.36
AGL	MWM	WINDOM MUNI	WINDOM	MN	140481.	60064.	140.	0.90	1.33

AGL	FFM	FERGUS FALLS MUNI-EINAR MICKELSON FLD	FERGUS FALLS	MN	55305.	123415.	0.	1.06	1.19
AGL	ONA	WINONA MUNI-MAX CONRAD FLD	WINONA	MN	134402.	43481.	120.	1.11	1.18
AGL	MVE	MONTEVIDEO-CHIPPEWA COUNTY	MONTEVIDEO	MN	141848.	24601.	137.	0.97	1.11
AGL	Y25	GATEWAY NORTH INDUSTRIAL	ANOKA	MN	116423.	24699.	81.	0.74*	0.94*
AGL	PQN	PIPESTONE MUNI	PIPESTONE	MN	22263.	107328.	0.	0.63	0.86
AGL	DTL	DETROIT LAKES	DETROIT LAKES	MN	22158.	103824.	0.	0.60	0.84
AGL	MJQ	JACKSON MUNI	JACKSON	MN	101444.	17625.	98.	0.70	0.79
AGL	CKN	CROOKSTON MUNI KIRKWOOD FLD	CROOKSTON	MN	52631.	57185.	0.	0.67	0.73
AGL	MOX	MORRIS MUNI	MORRIS	MN	67118.	22240.	61.	0.47	0.59
AGL	Y39	OLIVIA MUNI	OLIVIA	MN	55181.	29095.	193.	1.34	0.56
AGL	RWF	REDWOOD FALLS MUNI	REDWOOD FALLS	MN	33231.	28701.	2.	1.23	0.41
AGL	FBL	FARIBAULT MUNI	FARIBAULT	MN	40541.	13232.	0.	1.55	0.36
AGL	SAZ	STAPLES MUNICIPAL	STAPLES	MN	43364.	7986.	39.	0.28	0.34
AGL	HCD	HUTCHINSON MUNI	HUTCHINSON	MN	30610.	20918.	0.	0.34	0.34
AGL	Y33	MAPLE LAKE MUNI	MAPLE LAKE	MN	29159.	18002.	75.	0.54	0.31
AGL	AIT	AITKIN MUNICIPAL	AITKIN	MN	31114.	10157.	0.	0.85	0.27
AGL	GRM	DEVILS TRACK MUNI	GRAND MARAIS	MN	32996.	5305.	31.	0.24	0.26
AGL	D31	RED WING MUNI	RED WING	MN	25602.	12059.	0.	0.27	0.25
AGL	10D	WINSTED MUNI	WINSTED	MN	28932.	9444.	0.	0.29	0.25
AGL	8Y6	LEADERS CLEAR LAKE	CLEAR LAKE	MN	28513.	9307.	0.	0.28	0.25
AGL	ACQ	WASECA MUNI	WASECA	MN	20034.	15321.	0.	0.71	0.23
AGL	8Y0	BLUE EARTH MUNI	BLUE EARTH	MN	26270.	8575.	0.	0.26	0.23
AGL	Y63	ELBOW LAKE MUNI	ELBOW LAKE	MN	24773.	8086.	0.	0.25	0.22
AGL	D14	FERTILE MUNI	FERTILE	MN	20739.	12233.	0.	0.23	0.22
AGL	20Y	FLYNNS FIELD	MONTICELLO	MN	23479.	7664.	0.	0.23	0.21
AGL	8Y2	BUFFALO MUNI	BUFFALO	MN	23801.	6322.	70.	0.48	0.20
AGL	14D	PRINCETON MUNI	PRINCETON	MN	23141.	7553.	0.	0.23	0.20
AGL	D36	SKY HARBOR	DULUTH	MN	21114.	6891.	0.	0.21	0.19
AGL	CBG	CAMBRIDGE MUNI	CAMBRIDGE	MN	20788.	6785.	0.	0.21	0.18
AGL	64Y	WADENA MUNI	WADENA	MN	17996.	8691.	0.	0.19	0.18
AGL	Y68	TRACY MUNI	TRACY	MN	10407.	14644.	0.	0.14	0.17
AGL	RAD	WARROAD INTL-SWEDE CARLSON FIELD	WARROAD	MN	8156.	17414.	0.	0.13	0.17
AGL	D19	LUVERNE MUNI	LUVERNE	MN	10144.	13368.	0.	0.14	0.16
AGL	25D	FOREST LAKE	FOREST LAKE	MN	17827.	5819.	0.	0.18	0.16
AGL	74Y	NORTHPORT	WHITE BEAR LAKE	MN	18577.	6063.	0.	0.19	0.16
AGL	D33	LONGVILLE MUNI	LONGVILLE	MN	17075.	5572.	0.	0.17	0.15
AGL	Y69	LITCHFIELD MUNI	LITCHFIELD	MN	16763.	5471.	0.	0.16	0.15
AGL	9Y7	FOSSTON MUNI	FOSSTON	MN	14781.	7319.	0.	0.16	0.15
AGL	SYN	CARLETON	STANTON	MN	15513.	5064.	0.	0.15	0.14
AGL	14Y	TODD FIELD	LONG PRAIRIE	MN	12731.	6650.	0.	0.14	0.13
AGL	D24	ORTONVILLE MUNI	ORTONVILLE	MN	15250.	4978.	0.	0.15	0.13
AGL	54Y	RUSH CITY MUNI	RUSH CITY	MN	13236.	4320.	0.	0.13	0.12
AGL	CHU	HOUSTON COUNTY	CALEDONIA	MN	14794.	3793.	50.	0.33	0.12
AGL	1D6	HECTOR MUNI	HECTOR	MN	12061.	3937.	0.	0.12	0.11
AGL	Y58	SLEEPY EYE MUNI	SLEEPY EYE	MN	12762.	4166.	0.	0.13	0.11
AGL	Y29	GLENCOE MUNI	GLENCOE	MN	12201.	3983.	0.	0.12	0.11
AGL	D81	RED LAKE FALLS MUNI	RED LAKE FALLS	MN	12996.	4243.	0.	0.13	0.11
AGL	53D	GLENWOOD MUNI	GLENWOOD	MN	13222.	3181.	55.	0.29	0.11
AGL	04Y	HAWLEY MUNI	HAWLEY	MN	11008.	3593.	0.	0.11	0.10
AGL	D40	ST JAMES MUNI	ST JAMES	MN	11144.	3638.	0.	0.11	0.10
AGL	D00	NORMAN COUNTY ADA-TWIN VALLEY	ADA - TWIN VALLEY	MN	11448.	3737.	0.	0.11	0.10
AGL	03Y	HALLOCK MUNI	HALLOCK	MN	6723.	7213.	0.	0.20	0.09
AGL	12Y	LE SUEUR MUNI	LE SUEUR	MN	10373.	3386.	0.	0.10	0.09
AGL	87D	DODGE COUNTY	DODGE CENTER	MN	11132.	2864.	37.	0.24	0.09
AGL	ORB	ORR REGIONAL	ORR	MN	10295.	3360.	0.	0.34	0.09
AGL	DXX	DAWSON-MADISON-LAC QUI PARLE COUNTY	MADISON	MN	9936.	3243.	0.	0.10	0.09
AGL	49Y	FILLMORE COUNTY	PRESTON	MN	10561.	3447.	0.	0.11	0.09
AGL	D42	SPRINGFIELD MUNI	SPRINGFIELD	MN	8912.	2909.	0.	0.09	0.08
AGL	76Y	BENSON	WHITE BEAR LAKE	MN	8565.	2796.	0.	0.09	0.08
AGL	68Y	WELLS MUNI	WELLS	MN	7594.	2479.	0.	0.08	0.07

AGL	19D	MORA MUNI	MORA	MN	7914.	2583.	0.	0.08	0.07
AGL	62Y	TWO HARBORS MUNICIPAL	TWO HARBORS	MN	6334.	2067.	0.	0.06	0.06
AGL	58Y	SILVER BAY MUNI	SILVER BAY	MN	5256.	1716.	0.	0.05	0.05
AGL	70Y	WHEATON MUNI	WHEATON	MN	4339.	1416.	0.	0.04	0.04
AGL	6D1	BROOTEN MUNI	BROOTEN	MN	4552.	1486.	0.	0.05	0.04
AGL	06Y	HERMAN MUNI	HERMAN	MN	2667.	871.	0.	0.03	0.02
AGL	6MN5	MAHNOMEN COUNTY	MAHNOMEN	MN	2590.	845.	0.	0.03	0.02
AGL	JMS	JAMESTOWN MUNI	JAMESTOWN	ND	509805.	186818.	525.	3.41	4.63
AGL	DVL	DEVILS LAKE MUNI	DEVILS LAKE	ND	384053.	145141.	457.	3.17	3.52
AGL	DIK	DICKINSON MUNICIPAL	DICKINSON	ND	139674.	92378.	144.	1.24	1.54
AGL	D04	BOWMAN MUNICIPAL	BOWMAN	ND	50891.	111271.	0.	0.88	1.08
AGL	RUG	RUGBY MUNI	RUGBY	ND	47066.	14769.	37.	0.43	0.41
AGL	Y19	MANDAN MUNI	MANDAN	ND	23697.	20795.	0.	0.29	0.30
AGL	GAF	GRAFTON MUNI	GRAFTON	ND	22107.	20923.	0.	0.27	0.29
AGL	6D8	BARNES COUNTY MUNICIPAL	VALLEY CITY	ND	25935.	13588.	0.	0.28	0.26
AGL	HEI	HETTINGER MUNICIPAL	HETTINGER	ND	16180.	16239.	0.	0.20	0.22
AGL	D63	BRECKENRIDGE-WAHPETON INTERSTATE	WAHPETON	ND	18242.	11077.	0.	0.21	0.19
AGL	D60	TIOGA MUNI	TIOGA	ND	16367.	10466.	0.	0.19	0.18
AGL	D09	BOTTINEAU MUNI	BOTTINEAU	ND	8969.	15927.	0.	0.14	0.17
AGL	D55	LANGDON MUNI	LANGDON	ND	15877.	10305.	0.	0.18	0.17
AGL	06D	ROLLA MUNI	ROLLA	ND	8969.	13359.	0.	0.13	0.15
AGL	ND34	LISBON MUNI	LISBON	ND	17452.	5697.	0.	0.18	0.15
AGL	3ND0	VINCE	NORTHWOOD	ND	16180.	5281.	0.	0.16	0.14
AGL	ND31	LARIMORE MUNI	LARIMORE	ND	16180.	5281.	0.	0.16	0.14
AGL	1ND3	HAMRY FIELD	KINDRED	ND	14577.	4758.	0.	0.15	0.13
AGL	08D	STANLEY MUNI	STANLEY	ND	8969.	10739.	0.	0.12	0.13
AGL	Y36	MOHALL MUNI	MOHALL	ND	14300.	4668.	0.	0.15	0.13
AGL	PMB	PEMBINA MUNI	PEMBINA	ND	10546.	8565.	0.	0.13	0.13
AGL	ND44	MOTT MUNICIPAL	MOTT	ND	14300.	4668.	0.	0.15	0.13
AGL	S32	COOPERSTOWN MUNI	COOPERSTOWN	ND	13214.	4313.	0.	0.14	0.12
AGL	D50	CROSBY MUNI	CROSBY	ND	13214.	4313.	0.	0.14	0.12
AGL	05D	NEW TOWN MUNI	NEW TOWN	ND	5815.	12329.	0.	0.10	0.12
AGL	ND59	ST THOMAS MUNI	ST THOMAS	ND	12251.	4000.	0.	0.12	0.11
AGL	96D	WALHALLA MUNI	WALHALLA	ND	12120.	3957.	0.	0.12	0.11
AGL	D57	GLEN ULLIN MUNI	GLEN ULLIN	ND	11146.	3638.	0.	0.11	0.10
AGL	ND06	CAVALIER MUNI	CAVALIER	ND	9756.	3185.	0.	0.10	0.09
AGL	S25	WATFORD CITY MUNI	WATFORD CITY	ND	10059.	3283.	0.	0.10	0.09
AGL	D56	MAYVILLE MUNI	MAYVILLE	ND	9133.	2982.	0.	0.09	0.08
AGL	Y37	PARK RIVER MUNI	PARK RIVER	ND	8607.	2810.	0.	0.09	0.08
AGL	Y74	HANKINS FIELD	PARSHALL	ND	7926.	2587.	0.	0.08	0.07
AGL	S28	INTERNATIONAL PEACE GARDEN	DUNSEITH	ND	7994.	2609.	0.	0.08	0.07
AGL	ND12	ELLENDALE MUNI	ELLENDALE	ND	6871.	2243.	0.	0.07	0.06
AGL	ND49	OAKES MUNICIPAL	OAKES	ND	5927.	1935.	0.	0.06	0.05
AGL	ASY	ASHLEY MUNI	ASHLEY	ND	5814.	1898.	0.	0.06	0.05
AGL	20U	BEACH	BEACH	ND	4555.	1487.	0.	0.05	0.04
AGL	D64	WESTHOPE MUNI	WESTHOPE	ND	4238.	1383.	0.	0.04	0.04
AGL	90Y	LEONARD MUNICIPAL	LEONARD	ND	1778.	580.	0.	0.02	0.02
AGL	22G	LORAIN COUNTY REGIONAL	LORAIN/ELYRIA/	OH	1847813.	416113.	1898.	10.60	15.04
AGL	MGY	DAYTON GENERAL ARPT SOUTH	DAYTON	OH	1533983.	353604.	1633.	7.54	12.54
AGL	HAO	HAMILTON AIRPORT	HAMILTON	OH	914329.	263137.	909.	6.23*	7.82*
AGL	2I4	BOLTON FLD	COLUMBUS	OH	831125.	247558.	927.	5.44*	7.17*
AGL	LNN	LOST NATION	WILLOUGHBY	OH	741814.	183543.	721.	4.88*	6.15*
AGL	MWO	HOOK FIELD MUNI	MIDDLETOWN	OH	700924.	219733.	738.	4.31	6.12
AGL	MNN	MARION MUNI	MARION	OH	696627.	209299.	727.	3.88	6.02
AGL	5G7	BLUFFTON	BLUFFTON	OH	657383.	152361.	632.	3.38	5.38
AGL	1G3	ANDREW W PATON OF KENT STATE UNIV	KENT	OH	570555.	204952.	489.	3.95*	5.15*
AGL	AOH	ALLEN COUNTY	LIMA	OH	567656.	203933.	562.	3.14	5.13
AGL	PHD	HARRY CLEVER FIELD	NEW PHILADELPHIA	OH	556437.	190945.	550.	3.91*	4.97*

AGL	I19	GREENE COUNTY	XENIA	OH	525331.	165270.	529.	3.03	4.59
AGL	7G2	ASHTABULA COUNTY	ASHTABULA	OH	470970.	127304.	497.	2.65	3.98
AGL	14G	PROGRESS FIELD	FREMONT	OH	453845.	129132.	464.	3.37	3.87
AGL	I77	CINCINNATI-BLUE ASH	CINCINNATI	OH	438446.	110033.	443.	2.24	3.64
AGL	02G	COLUMBIANA COUNTY	EAST LIVERPOOL	OH	430110.	113303.	414.	2.02	3.61
AGL	GQQ	GALION MUNI	GALION	OH	367903.	173837.	335.	2.37	3.60
AGL	TDZ	METCALF FIELD	TOLEDO	OH	382623.	152559.	310.	3.14	3.56
AGL	FDY	FINDLAY	FINDLAY	OH	372240.	93812.	383.	1.96	3.10
AGL	I15	FAIRFIELD COUNTY	LANCASTER	OH	308698.	158290.	237.	2.40*	3.10*
AGL	I67	HARRISON	HARRISON	OH	341742.	62577.	345.	2.45*	2.69*
AGL	ZZV	ZANESVILLE MUNI	ZANESVILLE	OH	297361.	101900.	295.	2.00	2.65
AGL	USE	FULTON COUNTY	WAUSEON	OH	323121.	73356.	327.	2.09	2.63
AGL	I69	CLERMONT COUNTY	BATAVIA	OH	253676.	99921.	228.	1.76*	2.35*
AGL	3G4	ASHLAND COUNTY	ASHLAND	OH	273536.	70996.	288.	1.20	2.29
AGL	16G	SENECA COUNTY	TIFFIN	OH	237402.	103530.	0.	0.77	2.27
AGL	2G1	CONCORD AIRPARK	PAINESVILLE	OH	278077.	50950.	266.	1.72*	2.19*
AGL	17G	PORT BUCYRUS-CRAWFORD COUNTY	BUCYRUS	OH	220987.	90048.	210.	1.54*	2.07*
AGL	SKY	GRIFFING SANDUSKY	SANDUSKY	OH	147984.	140344.	86.	1.67	1.92
AGL	4I3	KNOX COUNTY	MOUNT VERNON	OH	163721.	122112.	165.	1.39*	1.90*
AGL	I12	SIDNEY	SIDNEY	OH	212256.	60434.	220.	1.05	1.81
AGL	TSO	CARROLL COUNTY-TOLSON	CARROLLTON	OH	220993.	50966.	203.	1.45	1.81
AGL	4G3	GREAT LAKES AERO-PORT	ALLIANCE	OH	214979.	50786.	191.	1.37*	1.77*
AGL	I23	FAYETTE COUNTY	WASHINGTON COURT HOUSE	OH	212567.	53699.	200.	1.29	1.77
AGL	DFI	DEFIANCE MEML	DEFIANCE	OH	137859.	126948.	138.	1.19	1.76
AGL	I17	PIQUA	PIQUA	OH	211508.	45697.	220.	1.50	1.71
AGL	UNI	OHIO UNIVERSITY	ATHENS/ALBANY	OH	174817.	81060.	170.	1.21	1.70
AGL	1G5	FREEDOM FIELD	MEDINA	OH	143321.	107174.	0.	1.70	1.66
AGL	0G6	WILLIAMS COUNTY	BRYAN	OH	139941.	102362.	139.	1.15*	1.61*
AGL	DLZ	DELAWARE MUNI	DELAWARE	OH	106887.	131079.	0.	1.45	1.58
AGL	15G	WELTZIEN SKYPARK	WADSWORTH	OH	141922.	61374.	0.	1.53	1.35
AGL	1G0	WOOD COUNTY	BOWLING GREEN	OH	157792.	42722.	159.	0.83	1.33
AGL	I78	UNION COUNTY	MARYSVILLE	OH	158380.	40834.	153.	1.07	1.32
AGL	3G6	TRI-CITY	SEBRING	OH	118277.	69776.	124.	0.59	1.25
AGL	OXD	MIAMI UNIVERSITY	OXFORD	OH	140750.	42451.	141.	0.68	1.22
AGL	4I2	SOUTH COLUMBUS	COLUMBUS	OH	94690.	83209.	0.	1.17	1.18
AGL	2I8	NEWARK-HEATH	NEWARK	OH	103248.	71465.	1.	3.25	1.16
AGL	GAS	GALLIA-MEIGS REGIONAL	GALLIPOLIS	OH	49949.	121669.	0.	1.02	1.14
AGL	OH17	HENRY COUNTY	NAPOLEON	OH	82755.	86276.	72.	0.77*	1.12*
AGL	PCW	CARL R KELLER FIELD	PORT CLINTON	OH	46954.	120688.	0.	0.98	1.11
AGL	UYF	MADISON COUNTY	LONDON	OH	66615.	97586.	204.	1.60	1.09
AGL	06G	YOUNGSTOWN EXECUTIVE	YOUNGSTOWN	OH	42970.	119390.	0.	1.63	1.08
AGL	I40	RICHARD DOWNING	COSHOCTON	OH	125387.	37593.	119.	0.84*	1.08*
AGL	6G5	BARNESVILLE-BRADFIELD	BARNESVILLE	OH	137219.	23188.	140.	0.67	1.07
AGL	I68	LEBANON-WARREN COUNTY	LEBANON	OH	127557.	30647.	120.	0.81*	1.05*
AGL	HOC	HIGHLAND COUNTY	HILLSBORO	OH	115318.	41919.	108.	0.96	1.04
AGL	PMH	GREATER PORTSMOUTH REGIONAL	PORTSMOUTH	OH	46419.	109061.	1.	1.62	1.03
AGL	04G	LANSDOWNE	YOUNGSTOWN	OH	129460.	23724.	129.	0.86*	1.02*
AGL	I54	MAD RIVER INC.	TREMONT CITY	OH	33090.	116166.	0.	0.84	0.99
AGL	7I7	BELLEFONTAINE MUNI	BELLEFONTAINE	OH	116942.	30252.	117.	0.74	0.98
AGL	VNW	VAN WERT MUNI	VAN WERT	OH	112144.	35814.	107.	0.67	0.98
AGL	AXV	NEIL ARMSTRONG	WAPAKONETA	OH	123566.	21270.	124.	0.84*	0.96*
AGL	29G	PORTAGE COUNTY	RAVENNA	OH	88342.	56799.	80.	0.69*	0.96*
AGL	CYO	PICKAWAY COUNTY MEMORIAL	CIRCLEVILLE	OH	98026.	39999.	95.	0.65	0.92
AGL	2G2	STEUBENVILLE PIER	STEUBENVILLE	OH	74121.	59346.	0.	0.89	0.89
AGL	89D	KELLEYS ISLAND LAND FLD	KELLEYS ISLAND	OH	26673.	102749.	0.	0.64	0.86
AGL	56D	WYANDOT COUNTY	UPPER SANDUSKY	OH	66586.	54780.	102.	1.08	0.81
AGL	7G8	GEAUGA COUNTY	MIDDLEFIELD	OH	74775.	39605.	65.	0.56*	0.76*
AGL	3I7	MYERS	PHILLIPSBURG	OH	88808.	24365.	47.	0.65	0.75
AGL	8G1	WILLARD	WILLARD	OH	43314.	69303.	34.	0.50*	0.75*
AGL	CQA	LAKEFIELD	CELINA	OH	90539.	22088.	84.	0.68	0.75

AGL	BJJ	WAYNE COUNTY	WOOSTER	OH	66365.	45187.	43.	0.60*	0.74*
AGL	3D8	BORDNER AIRSTRIP	BOWLING GREEN	OH	65749.	44860.	0.	0.73	0.73
AGL	1G1	ELYRIA	ELYRIA	OH	84869.	24910.	83.	0.57*	0.73*
AGL	I73	MORAINE AIR PARK	DAYTON	OH	80064.	26135.	0.	0.83	0.71
AGL	OH30	PUT IN BAY	PUT IN BAY	OH	9979.	91169.	0.	0.43	0.67
AGL	3I9	BUCKEYE VALLEY	HEBRON	OH	68051.	27629.	62.	0.47*	0.64*
AGL	OH21	HURON COUNTY-CITY OF NORWALK	NORWALK	OH	15362.	80414.	0.	0.43	0.64
AGL	62D	WARREN	WARREN	OH	53335.	38229.	35.	0.47*	0.61*
AGL	1G6	STRONGSVILLE	STRONGSVILLE	OH	67482.	22028.	0.	0.70	0.59
AGL	10G	HOLMES COUNTY	MILLERSBURG	OH	60667.	21489.	55.	0.39	0.55
AGL	4G4	YOUNGSTOWN ELSER METRO	NORTH LIMA	OH	66390.	12201.	62.	0.41*	0.52*
AGL	37I	TROY SKYPARK	TROY	OH	65978.	12995.	64.	0.41*	0.52*
AGL	12G	SHELBY COMMUNITY	SHELBY	OH	60728.	15765.	58.	0.39*	0.51*
AGL	PVZ	CASEMENT	PAINESVILLE	OH	58787.	10405.	57.	0.37*	0.46*
AGL	I44	DAHIO	DAYTON	OH	28293.	36181.	0.	0.38	0.43
AGL	OH14	WOODRUFF	MONTPELIER	OH	41691.	18578.	0.	0.45	0.40
AGL	CDI	CAMBRIDGE MUNI	CAMBRIDGE	OH	14795.	45061.	0.	0.55	0.40
AGL	3I0	RIVERSIDE	ZANESVILLE	OH	44403.	14495.	0.	0.44	0.39
AGL	7D5	PRIEBE	FINDLAY	OH	18497.	38371.	0.	0.30	0.38
AGL	I62	BROOKVILLE AIR-PARK	BROOKVILLE	OH	39531.	18295.	0.	0.42	0.38
AGL	FZI	FOSTORIA METROPOLITAN	FOSTORIA	OH	26983.	26724.	85.	0.61	0.36
AGL	AMT	ALEXANDER SALAMON	WEST UNION	OH	18469.	35182.	0.	0.31	0.36
AGL	RZT	ROSS COUNTY	CHILLICOTHE	OH	27504.	23470.	0.	0.34	0.34
AGL	8G6	HARRISON COUNTY	CADIZ	OH	24968.	24187.	78.	0.46	0.33
AGL	I10	NOBLE COUNTY AIRPARK	CALDWELL	OH	17058.	31706.	0.	0.27	0.32
AGL	VES	DARKE COUNTY	VERSAILES	OH	37270.	11093.	130.	0.69	0.32
AGL	3G3	WADSWORTH MUNI	WADSWORTH	OH	31106.	15451.	0.	0.34	0.31
AGL	I74	GRIMES FIELD	URBANA	OH	31398.	12786.	0.	0.33	0.29
AGL	GEO	BROWN COUNTY	GEORGETOWN	OH	10231.	31581.	0.	0.23	0.28
AGL	OWX	PUTNAM COUNTY	OTTAWA	OH	25963.	15215.	0.	0.28	0.27
AGL	4G8	COLUMBIA	COLUMBIA STATION	OH	27818.	9081.	0.	0.28	0.25
AGL	OH23	BLATTER	ORRVILLE	OH	12354.	24148.	0.	0.20	0.24
AGL	I43	JAMES A RHODES	JACKSON	OH	15116.	19680.	45.	0.35	0.23
AGL	HTW	LAWRENCE COUNTY AIRPARK	CHESAPEAKE/HUNTINGTON	OH	16133.	17942.	0.	0.21	0.23
AGL	4D6	CHARDON	CHARDON	OH	24779.	8089.	0.	0.25	0.22
AGL	2D7	BEACH CITY	BEACH CITY	OH	25152.	8212.	0.	0.25	0.22
AGL	5D4	MARTIN FIELD	CANTON	OH	14109.	15383.	0.	0.18	0.20
AGL	04I	COLUMBUS SOUTHWEST	COLUMBUS	OH	22919.	7482.	0.	0.23	0.20
AGL	OH20	NORTHFIELD	NORTHFIELD	OH	22324.	7288.	0.	0.22	0.20
AGL	22I	VINTON COUNTY	MCARTHUR	OH	10874.	16212.	0.	0.16	0.18
AGL	09I	DELPHOS	DELPHOS	OH	19094.	6234.	0.	0.19	0.17
AGL	19I	BROWNIES LEBANON	LEBANON	OH	9163.	14203.	0.	0.13	0.16
AGL	1G8	DYER	TORONTO	OH	18335.	5985.	0.	0.18	0.16
AGL	I66	CLINTON FIELD	WILMINGTON	OH	9201.	13065.	0.	0.13	0.15
AGL	I71	MORGAN COUNTY	MCCONNELSVILLE	OH	5381.	16708.	0.	0.11	0.15
AGL	42I	PARR	ZANESVILLE	OH	13001.	9419.	0.	0.15	0.15
AGL	I57	PIKE COUNTY	WAVERLY	OH	8491.	12859.	0.	0.12	0.14
AGL	I95	HARDIN COUNTY	KENTON	OH	15612.	5096.	0.	0.16	0.14
AGL	OI03	ALDERMAN	ST CLAIRSVILLE	OH	15113.	4933.	0.	0.15	0.13
AGL	88D	HURON	HURON	OH	9203.	8393.	0.	0.11	0.12
AGL	40I	WAYNESVILLE	WAYNESVILLE	OH	13004.	4245.	0.	0.13	0.11
AGL	67D	BOTSFORD	WELLINGTON	OH	11945.	4439.	0.	0.12	0.11
AGL	4G5	MONROE COUNTY	WOODSFIELD	OH	6789.	8250.	0.	0.09	0.10
AGL	I70	OBERLIN	OBERLIN	OH	10715.	3498.	0.	0.11	0.09
AGL	38D	SALEM AIRPARK INC	SALEM	OH	10222.	3337.	0.	0.10	0.09
AGL	I51	TYLER	ABERDEEN	OH	4877.	6981.	0.	0.07	0.08
AGL	4I9	MORROW COUNTY	MT GILEAD	OH	9229.	3013.	0.	0.10	0.08
AGL	2D1	BARBER	ALLIANCE	OH	8963.	2926.	0.	0.09	0.08
AGL	I86	PERRY COUNTY	NEW LEXINGTON	OH	7694.	2511.	0.	0.08	0.07
AGL	6G4	WYNKOOP	MT VERNON	OH	6524.	2770.	0.	0.07	0.06

AGL	OH15	MINERVA	MINERVA	OH	7258.	2370.	0.	0.07	0.06
AGL	OH07	SUNSET STRIP	MARLBORO	OH	5984.	1953.	0.	0.06	0.05
AGL	6D2	ASHTABULA CONNEAUT	CONNEAUT	OH	5051.	1649.	0.	0.05	0.04
AGL	52D	TIFFIN	TIFFIN	OH	4322.	1411.	0.	0.04	0.04
AGL	OH09	MIDDLE BASS-EAST POINT	MIDDLE BASS ISLAND	OH	2606.	2062.	0.	0.03	0.03
AGL	11I	CRAFT	FREDERICKTOWN	OH	1977.	1940.	0.	0.02	0.03
AGL	ILN	WILMINGTON INDUSTRIAL AIRPARK	WILMINGTON	OH	3178.	1037.	0.	0.03	0.03
AGL	7D6	LIBERTY AIRPARK	FREEDOM	OH	2800.	914.	0.	0.03	0.02
AGL	8G8	KOONS	SALEM	OH	2273.	742.	0.	0.02	0.02
AGL	OH06	MILLS	MANTUA	OH	2757.	900.	0.	0.03	0.02
AGL	OH36	MILLER FARM LANDING STRIP	BALTIMORE	OH	1621.	529.	0.	0.02	0.01
AGL	63D	GRIESER	WAUSEON	OH	1239.	404.	0.	0.01	0.01
AGL	PIR	PIERRE MUNI	PIERRE	SD	857207.	244522.	930.	4.88	7.32
AGL	ATY	WATERTOWN MUNI	WATERTOWN	SD	800879.	235666.	844.	4.48	6.89
AGL	MHE	MITCHELL MUNI	MITCHELL	SD	524431.	195118.	521.	3.99	4.78
AGL	YKN	CHAN GURNEY MUNI	YANKTON	SD	425559.	177124.	440.	3.19	4.00
AGL	BKX	BROOKINGS MUNI	BROOKINGS	SD	392459.	172452.	402.	3.15	3.75
AGL	Y14	SKY HAVEN AIRPARK	SIOUX FALLS	SD	355538.	74843.	345.	2.26*	2.86*
AGL	SPF	BLACK HILLS	SPEARFISH	SD	42932.	34796.	0.	0.51	0.52
AGL	LEM	LEMMON MUNI	LEMMON	SD	49602.	23952.	0.	0.54	0.49
AGL	PHP	PHILIP	PHILIP	SD	42562.	24336.	0.	1.58	0.44
AGL	3VM	HAROLD DAVIDSON FIELD	VERMILLION	SD	42437.	17798.	0.	0.45	0.40
AGL	MDS	MADISON MUNI	MADISON	SD	32949.	26305.	0.	0.39	0.39
AGL	66D	STURGIS MUNI	STURGIS	SD	44055.	14380.	0.	0.45	0.39
AGL	MBG	MOBRIDGE MUNI	MOBRIDGE	SD	33768.	25317.	0.	0.40	0.39
AGL	SD39	BOB WILEY FIELD	WINNER	SD	28366.	24972.	0.	0.35	0.36
AGL	3BF	BUS FIELD	BELLE FOURCHE	SD	23678.	28512.	0.	0.32	0.35
AGL	HSR	HOT SPRINGS MUNI	HOT SPRINGS	SD	33393.	16028.	0.	0.36	0.33
AGL	CHB	CHAMBERLAIN MUNI	CHAMBERLAIN	SD	37950.	12386.	0.	0.39	0.33
AGL	AGZ	WAGNER MUNI	WAGNER	SD	34941.	11404.	0.	0.35	[illegible]
AGL	0D8	GETTYSBURG MUNI	GETTYSBURG	SD	33836.	11044.	0.	0.35	0.30
AGL	8D7	CLARK COUNTY	CLARK	SD	32187.	10506.	0.	0.33	0.28
AGL	3FU	FAULKTON MUNI	FAULKTON	SD	28799.	9400.	0.	0.29	0.25
AGL	3BT	BRITTON MUNI	BRITTON	SD	27292.	8908.	0.	0.28	0.24
AGL	1D8	REDFIELD MUNI	REDFIELD	SD	27595.	9007.	0.	0.28	0.24
AGL	1D0	MILLER MUNI	MILLER	SD	22358.	7297.	0.	0.23	0.20
AGL	8D3	SISSETON MUNI	SISSETON	SD	19282.	8861.	0.	0.21	0.19
AGL	1D1	MILBANK MUNI	MILBANK	SD	15786.	7721.	0.	0.17	0.16
AGL	9D1	GREGORY MUNI	GREGORY	SD	10033.	13719.	0.	0.14	0.16
AGL	SD34	PRESHO MUNI	PRESHO	SD	16049.	5239.	0.	0.16	0.14
AGL	1D7	WEBSTER MUNI	WEBSTER	SD	11135.	3635.	0.	0.11	0.10
AGL	9V6	MARTIN MUNI	MARTIN	SD	10033.	3275.	0.	0.10	0.09
AGL	6V4	WALL MUNI	WALL	SD	4010.	6437.	0.	0.06	0.07
AGL	98D	ONIDA MUNI	ONIDA	SD	7894.	2577.	0.	0.08	0.07
AGL	SD33	PARKSTON MUNI	PARKSTON	[illegible]	7426.	2975.	0.	0.08	0.07
AGL	5V8	KADOKA MUNI	KADOKA	[illegible]	7025.	2293.	0.	0.07	0.06
AGL	9D2	HARDING COUNTY	BUFFALO	SD	6351.	2073.	0.	0.06	0.06
AGL	6V0	EDGEMONT MUNI	EDGEMONT	SD	5262.	1718.	0.	0.05	0.05
AGL	6V2	PINE RIDGE	PINE RIDGE	SD	4075.	1330.	0.	0.04	0.04
AGL	1D3	PLATTE MUNI	PLATTE	SD	3950.	1289.	0.	0.04	0.03
AGL	SD10	CANTON MUNI	CANTON	SD	2406.	785.	0.	0.02	0.02
AGL	8D9	HOWARD MUNI	HOWARD	SD	2270.	741.	0.	0.02	0.02
AGL	ENW	KENOSHA MUNI	KENOSHA	WI	1363976.	333945.	1406.	7.50	11.28
AGL	UES	WAUKESHA COUNTY	WAUKESHA	WI	1006748.	193139.	1008.	6.56*	7.97*
AGL	ETB	WEST BEND MUNI	WEST BEND	WI	820071.	241427.	780.	6.72	7.05
AGL	EAU	EAU CLAIRE COUNTY	EAU CLAIRE	WI	824663.	236967.	896.	3.99	7.05
AGL	SBM	SHEBOYGAN COUNTY MEMORIAL	SHEBOYGAN	WI	733198.	204078.	819.	4.22	6.23
AGL	ISW	ALEXANDER FIELD SOUTH WOOD COUNTY	WISCONSIN RAPIDS	WI	444000.	180604.	454.	2.94	4.15

AGL	FLD	FOND DU LAC COUNTY	FOND DU LAC	WI	432471.	175493.	437.	2.82	4.04
AGL	C29	MOREY	MADISON	WI	447021.	150978.	442.	3.10*	3.97*
AGL	RHI	RHINELANDER-ONEIDA COUNTY	RHINELANDER	WI	420208.	174821.	442.	2.76	3.95
AGL	MFI	MARSHFIELD MUNI	MARSHFIELD	WI	391060.	167033.	436.	2.16	3.71
AGL	ASX	JOHN F KENNEDY MEMORIAL	ASHLAND	WI	382527.	166727.	529.	2.14	3.65
AGL	C31	HARTFORD MUNI	HARTFORD	WI	434200.	111628.	434.	2.76	3.63
AGL	C52	BURLINGTON MUNI	BURLINGTON	WI	428546.	86353.	444.	2.30	3.42
AGL	MTW	MANITOWOC COUNTY	MANITOWOC	WI	349351.	161872.	375.	2.15	3.40
AGL	CWA	CENTRAL WISCONSIN	MOSINEE	WI	333487.	160461.	321.	1.98	3.28
AGL	STE	STEVENS POINT MUNI	STEVENS POINT	WI	319200.	143431.	318.	2.41	3.07
AGL	HYR	HAYWARD MUNI	HAYWARD	WI	295309.	152135.	452.	2.21	2.97
AGL	AUW	WAUSAU MUNI	WAUSAU	WI	289221.	155221.	284.	2.2[illegible]*	2.95*
AGL	C02	PLAYBOY	LAKE GENEVA	WI	229759.	131662.	234.	2.06	2.40
AGL	44C	BELOIT	BELOIT	WI	222649.	125224.	221.	1.72*	2.31*
AGL	SUW	RICHARD I BONG	SUPERIOR	WI	280427.	61663.	290.	1.62	2.27
AGL	ARV	LAKELAND	MINOCQUA/WOODRUFF	WI	219920.	96897.	218.	1.61	2.11
AGL	RAC	HORLICK-RACINE	RACINE	WI	228634.	86551.	237.	1.81	2.09
AGL	UNU	DODGE COUNTY	JUNEAU	WI	228978.	44391.	229.	1.42	1.82
AGL	RIE	RICE LAKE MUNICIPAL	RICE LAKE	WI	179485.	90168.	262.	1.24	1.79
AGL	CLI	CLINTONVILLE MUNI	CLINTONVILLE	WI	115746.	143137.	0.	5.97	1.72
AGL	C47	PORTAGE MUNI	PORTAGE	WI	188320.	62167.	186.	1.33*	1.66*
AGL	3CU	CABLE UNION	CABLE	WI	131944.	115176.	135.	1.29*	1.64*
AGL	EGV	EAGLE RIVER MUNI	EAGLE RIVER	WI	129899.	72315.	123.	1.35	1.34
AGL	C46	PLATTEVILLE	PLATTEVILLE	WI	160026.	34158.	147.	0.97*	1.29*
AGL	92C	CARTER	PULASKI	WI	152817.	31728.	161.	1.05*	1.29*
AGL	AIG	LANGLADE COUNTY	ANTIGO	WI	63551.	122116.	194.	2.34	1.23
AGL	RRL	MERRILL MUNI	MERRILL	WI	122036.	57589.	109.	1.10	1.19
AGL	Y35	BLACK RIVER FALLS AREA	BLACK RIVER FALLS	WI	135632.	32991.	136.	0.95*	1.12*
AGL	PVB	GRANT COUNTY	PLATTEVILLE	WI	122753.	38198.	122.	0.79	1.07
AGL	C85	BARABOO WISCONSIN DELLS	BARABOO	WI	111517.	43409.	113.	0.90*	1.03*
AGL	93C	RICHLAND	RICHLAND CENTER	WI	116725.	27455.	117.	0.79*	0.96*
AGL	WI07	WAUPUN	WAUPUN	WI	44000.	87687.	0.	0.73	0.87
AGL	OEO	OSCEOLA MUNI	OSCEOLA	WI	108432.	23005.	96.	0.83	0.87
AGL	PDC	PRAIRIE DU CHIEN MUNI	PRAIRIE DU CHIEN	WI	102154.	26803.	104.	0.59	0.86
AGL	RYV	WATERTOWN MUNI	WATERTOWN	WI	70851.	50584.	0.	0.80	0.81
AGL	LNL	KINGS LAND O' LAKES	LAND O' LAKES	WI	94884.	26062.	96.	0.81	0.80
AGL	C32	IOWA COUNTY	MINERAL POINT	WI	95423.	21474.	94.	0.63*	0.78*
AGL	LNR	TRI-COUNTY	LONE ROCK	WI	87034.	27356.	86.	0.61*	0.76*
AGL	PCZ	WAUPACA MUNI	WAUPACA	WI	42018.	62595.	0.	0.61	0.70
AGL	57C	EAST TROY MUNI	EAST TROY	WI	33613.	57408.	0.	0.52	0.60
AGL	91C	SAUK-PRAIRIE	PRAIRIE DU SAC	WI	23159.	56042.	0.	0.42	0.53
AGL	3WO	SHAWANO MUNI	SHAWANO	WI	31920.	47142.	0.	0.47	0.53
AGL	SUE	DOOR COUNTY CHERRYLAND	STURGEON BAY	WI	23189.	56429.	1.	1.10	0.53
AGL	D28	RUSK COUNTY	LADYSMITH	WI	22023.	56071.	0.	0.41	0.52
AGL	WI12	AMERY MUNI	AMERY	WI	30086.	47818.	0.	0.45	0.52
AGL	79C	BRENNAND	NEENAH	WI	48324.	26757.	0.	0.52	0.50
AGL	SSQ	SHELL LAKE MUNI	SHELL LAKE	WI	44277.	27663.	158.	1.18	0.48
AGL	02C	CAPITOL DRIVE	PEWAUKEE	WI	52196.	17037.	0.	0.54	0.46
AGL	Y78	RAINBOW	FRANKLIN	WI	39012.	26470.	0.	0.44	0.44
AGL	MDZ	TAYLOR COUNTY	MEDFORD	WI	18751.	45112.	1.	0.77	0.42
AGL	WI10	WESTOSHA	WILMOT	WI	44048.	14376.	0.	0.44	0.39
AGL	81C	NEILLSVILLE MUNI	NEILLSVILLE	WI	22527.	35469.	0.	0.33	0.39
AGL	D27	PRICE COUNTY	PHILLIPS	WI	15312.	44009.	0.	0.30	0.39
AGL	RNH	NEW RICHMOND MUNI	NEW RICHMOND	WI	26828.	25231.	0.	0.32	0.35
AGL	C33	MONROE MUNI	MONROE	WI	28837.	23947.	0.	0.35	0.35
AGL	C59	LAKE LAWN	DELAVAN	WI	27059.	25305.	0.	0.32	0.35
AGL	C89	SYLVANIA	STURTEVANT	WI	28838.	24124.	0.	0.35	0.35
AGL	Y52	BURNETT COUNTY	SIREN	WI	28609.	18851.	0.	0.33	0.32
AGL	8D1	NEW HOLSTEIN MUNI	NEW HOLSTEIN	WI	25706.	23101.	0.	0.32	0.32
AGL	88C	PALMYRA MUNI	PALMYRA	WI	29907.	17025.	0.	0.34	0.31

AGL	76C	AERO PARK	MENOMONEE FALLS	WI	33036.	10782.	0.	0.33	0.29
AGL	47C	BOSCOBEL	BOSCOBEL	WI	26513.	15899.	58.	0.50	0.28
AGL	73C	LANCASTER MUNICIPAL	LANCASTER	WI	15108.	24449.	0.	0.23	0.26
AGL	OCQ	OCONTO MUNI	OCONTO	WI	18012.	20589.	0.	0.24	0.26
AGL	PKF	PARK FALLS MUNI	PARK FALLS	WI	15241.	24564.	0.	0.23	0.26
AGL	D25	MANITOWISH WATERS	MANITOWISH WATERS	WI	12910.	23803.	0.	0.21	0.24
AGL	WI06	WAUNAKEE	WAUNAKEE	WI	20260.	14558.	0.	0.23	0.23
AGL	58C	TOBACCO CITY	EDGERTON/ALBION/	WI	19992.	12892.	0.	0.23	0.22
AGL	C35	REEDSBURG MUNI	REEDSBURG	WI	21026.	11697.	0.	0.75	0.22
AGL	Y50	WAUTOMA MUNI	WAUTOMA	WI	21933.	10777.	0.	0.24	0.22
AGL	C69	GONSTEAD	MT HOREB	WI	15101.	10421.	0.	0.17	0.17
AGL	96C	FOX RIVER	ROCHESTER	WI	18122.	5915.	0.	0.18	0.16
AGL	WI15	BARRON MUNI	BARRON	WI	13214.	7066.	0.	0.14	0.13
AGL	D74	SPARTA MUNI	SPARTA	WI	13460.	4393.	0.	0.13	0.12
AGL	GTG	GRANTSBURG MUNI	GRANTSBURG	WI	6525.	12183.	0.	0.10	0.12
AGL	C37	BRODHEAD	BRODHEAD	WI	12081.	5045.	0.	0.12	0.11
AGL	Y23	CHETEK MUNI-SOUTHWORTH	CHETEK	WI	9061.	5711.	0.	0.10	0.10
AGL	C76	LODI LAKELAND	LODI	WI	10959.	4678.	0.	0.11	0.10
AGL	94C	COWGILL FIELD	RIO	WI	9892.	3229.	0.	0.10	0.09
AGL	61C	FORT ATKINSON MUNI	FORT ATKINSON	WI	10697.	3492.	0.	0.11	0.09
AGL	Y72	BLOYER FIELD	TOMAH	WI	10070.	3287.	0.	0.10	0.09
AGL	WI05	BIG FOOT AIRFIELD	WALWORTH	WI	7475.	6565.	0.	0.09	0.09
AGL	52C	FLYING HOOF	COTTAGE GROVE	WI	3020.	6477.	0.	0.05	0.06
AGL	82C	MAUSTON-NEW LISBON UNION	NEW LISBON	WI	5409.	4199.	0.	0.06	0.06
AGL	3D2	EPHRAIM-FISH CREEK	EPHRAIM	WI	4200.	3805.	0.	0.05	0.05
AGL	64C	VINCENT	GENOA CITY	WI	6041.	1972.	0.	0.05	0.05
AGL	50C	GROB	CEDARBURG	WI	4656.	1520.	0.	0.05	0.04
AGL	63C	ADAMS COUNTY LEGION FIELD	FRIENDSHIP/ADAMS/	WI	4828.	1576.	0.	0.05	0.04
AGL	62C	HUNT FIELD	FRANKSVILLE	WI	4996.	1631.	0.	0.05	0.04
AGL	Y55	CRANDON MUNI	CRANDON	WI	2948.	3396.	0.	0.04	0.04
AGL	WI04	VERONA	VERONA	WI	4405.	1438.	0.	0.04	0.04

NEW ENGLAND REGION

ANE	OXC	WATERBURY-OXFORD	OXFORD	CT	1074489.	295102.	1053.	5.15	9.10
ANE	N04	GRISWOLD	MADISON	CT	197278.	139502.	195.	1.68*	2.24*
ANE	5B3	DANIELSON	DANIELSON	CT	253545.	59483.	249.	1.66*	2.08*
ANE	MMK	MERIDEN MARKHAM MUNI	MERIDEN	CT	113840.	133709.	383.	2.90	1.64
ANE	4B8	ROBERTSON FIELD	PLAINVILLE	CT	81970.	106584.	0.	1.14	1.25
ANE	7B8	NEW LONDON-WATERFORD	WATERFORD	CT	58289.	124389.	0.	1.08	1.21
ANE	5B0	WINDHAM	WILLIMANTIC	CT	117141.	30006.	400.	2.60	0.98
ANE	4B9	SIMSBURY TRI-TOWN	SIMSBURY	CT	28838.	103269.	0.	0.66	0.88
ANE	22B	JOHNNYCAKE	BURLINGTON	CT	40673.	28304.	0.	0.48	0.46
ANE	7B9	ELLINGTON	ELLINGTON	CT	38279.	12495.	0.	0.38	0.34
ANE	7B6	SKYLARK AIRPARK	WAREHOUSE PT	CT	16536.	12858.	0.	0.20	0.20
ANE	0N0	ANSONIA	ANSONIA	CT	1914.	625.	0.	0.02	0.02
ANE	6B6	MINUTE MAN AIRFIELD	STOW	MA	1330966.	254029.	1346.	9.71*	10.53*
ANE	TAN	TAUNTON MUNI	TAUNTON	MA	666084.	146678.	655.	3.61	5.40
ANE	FIT	FITCHBURG MUNI	FITCHBURG	MA	607458.	202435.	583.	4.80*	5.38*
ANE	B09	TEW-MAC	TEWKSBURY	MA	561909.	149490.	607.	3.62	4.73
ANE	3B2	MARSHFIELD	MARSHFIELD	MA	398501.	149973.	382.	2.79*	3.64*
ANE	PVC	PROVINCETOWN MUNI	PROVINCETOWN	MA	342121.	163012.	346.	3.13*	3.36*
ANE	GBR	GREAT BARRINGTON	GREAT BARRINGTON	MA	336389.	109635.	345.	2.23*	2.96*
ANE	0B5	TURNERS FALLS	MONTAGUE	MA	316853.	64040.	304.	1.99*	2.53*
ANE	PSF	PITTSFIELD MUNI	PITTSFIELD	MA	170245.	146820.	91.	3.32	2.11
ANE	1B9	MANSFIELD MUNI	MANSFIELD	MA	221630.	52787.	192.	1.42*	1.82*
ANE	0B6	CHATHAM MUNI	CHATHAM	MA	208922.	63987.	202.	1.40*	1.81*

ANE	PYM	PLYMOUTH MUNI	PLYMOUTH	MA	183731.	72828.	0.	1.95	1.70
ANE	3B0	SOUTHBRIDGE MUNI	SOUTHBRIDGE	MA	207739.	43401.	210.	1.60*	1.67*
ANE	GDM	GARDNER MUNI	GARDNER	MA	197224.	34581.	202.	1.24*	1.54*
ANE	2B6	NORTH ADAMS MUNICIPAL/HARRIMAN/	NORTH ADAMS	MA	62116.	113824.	0.	1.01	1.17
ANE	7B2	LA FLEUR	NORTHAMPTON	MA	50183.	66173.	0.	0.70	0.77
ANE	8B6	HAVERHILL	HAVERHILL	MA	69888.	17685.	49.	0.47*	0.58*
ANE	FLR	FALL RIVER MUNI	FALL RIVER	MA	60306.	24613.	0.	1.99	0.56
ANE	9B1	MARLBORO	MARLBORO	MA	52179.	17035.	0.	0.52	0.46
ANE	MA07	NORFOLK	NORFOLK	MA	51859.	16927.	0.	0.52	0.46
ANE	8B5	BARRE/HILLER	BARRE /BARRE PLAINS/	MA	46946.	15323.	0.	0.47	0.41
ANE	9B4	SHIRLEY	SHIRLEY	MA	37036.	13184.	0.	0.38	0.33
ANE	1B6	HOPEDALE-DRAPER	HOPEDALE	MA	34618.	14827.	0.	0.37	0.33
ANE	2B2	PLUM ISLAND	NEWBURYPORT	MA	26091.	15178.	0.	0.30	0.29
ANE	PMX	METROPOLITAN	PALMER	MA	19938.	21463.	0.	0.26	0.28
ANE	3B3	STERLING	STERLING	MA	17792.	16740.	0.	0.22	0.23
ANE	ORE	ORANGE MUNI	ORANGE	MA	29104.	5153.	28.	0.18*	0.23*
ANE	5B6	FALMOUTH	FALMOUTH	MA	14862.	7594.	0.	0.16	0.15
ANE	MA04	HAVERHILL-RIVERSIDE	HAVERHILL	MA	11561.	3773.	0.	0.12	0.10
ANE	MA03	HATFIELD-PILGRIM	HATFIELD	MA	10362.	3382.	0.	0.10	0.09
ANE	PQI	NORTHERN MAINE REGIONAL ARPT	PRESQUE ISLE	ME	606410.	201353.	653.	2.58	5.37
ANE	AUG	AUGUSTA STATE	AUGUSTA	ME	555076.	199910.	568.	3.85	5.02
ANE	SFM	SANFORD MUNI	SANFORD	ME	589308.	99466.	592.	2.88	4.58
ANE	WVL	WATERVILLE ROBERT LAFLEUR	WATERVILLE	ME	421882.	175198.	436.	2.62	3.97
ANE	FVE	NORTHERN AROOSTOOK REGIONAL	FRENCHVILLE	ME	467215.	123174.	773.	5.00	3.92
ANE	OLD	DEWITT FLD,OLD TOWN MUNI	OLD TOWN	ME	322945.	139186.	252.	1.81	3.07
ANE	B19	BIDDEFORD MUNI	BIDDEFORD	ME	338960.	84716.	330.	2.21*	2.82*
ANE	B20	EASTERN SLOPES REGIONAL	FRYEBURG	ME	253024.	44343.	246.	1.59*	1.98*
ANE	HUL	HOULTON INTL	HOULTON	ME	234738.	39402.	264.	1.28	1.82
ANE	MLT	MILLINOCKET MUNI	MILLINOCKET	ME	211527.	41993.	214.	1.34*	1.68*
ANE	RKD	KNOX COUNTY REGIONAL	ROCKLAND	ME	102000.	136024.	4.	4.35	1.58
ANE	CAR	CARIBOU MUNI	CARIBOU	ME	171556.	57266.	159.	1.14*	1.52*
ANE	LEW	AUBURN-LEWISTON MUNI	AUBURN-LEWISTON	ME	69703.	128114.	0.	3.10	1.31
ANE	2B7	PITTSFIELD MUNI	PITTSFIELD	ME	162712.	28284.	166.	1.03*	1.27*
ANE	BHB	HANCOCK COUNTY-BAR HARBOR	BAR HARBOR	ME	64376.	126374.	0.	1.17	1.27
ANE	3B7	BELFAST MUNI	BELFAST	ME	130681.	39052.	121.	0.85*	1.13*
ANE	3B5	TWITCHELL	TURNER	ME	65616.	62675.	0.	0.80	0.85
ANE	9B9	WISCASSET	WISCASSET	ME	74192.	39438.	0.	2.41	0.75
ANE	81B	OXFORD COUNTY REGIONAL	NORWAY	ME	32860.	10725.	0.	0.34	0.29
ANE	OWK	CENTRAL MAINE ARPT OF NORRIDGEWOCK	NORRIDGEWOCK	ME	30444.	9938.	0.	0.31	0.27
ANE	3B1	GREENVILLE MUNI	GREENVILLE	ME	31121.	5943.	32.	0.33	0.25
ANE	PNN	PRINCETON MUNI	PRINCETON	ME	30571.	5810.	27.	0.21	0.24
ANE	7B4	MACHIAS VALLEY	MACHIAS	ME	26931.	8791.	0.	0.28	0.24
ANE	0B2	BREWER	BREWER	ME	16259.	5308.	0.	0.16	0.14
ANE	1B0	SENATOR OWEN BREWSTER	DEXTER	ME	11958.	3903.	0.	0.12	0.11
ANE	64B	LINCOLN REGIONAL	LINCOLN	ME	11560.	2911.	42.	0.32	0.10
ANE	7B5	FORT KENT MUNI	FORT KENT	ME	8974.	5747.	0.	0.10	0.10
ANE	B21	SUGARLOAF REGIONAL	CARRABASSETT	ME	10630.	3469.	0.	0.11	0.09
ANE	57B	ISLESBORO	ISLESBORO	ME	6843.	2239.	0.	0.07	0.06
ANE	8B0	RANGELEY MUNI	RANGELEY	ME	7127.	2327.	0.	0.07	0.06
ANE	59B	NEWTON FIELD	JACKMAN	ME	5808.	1895.	0.	0.06	0.05
ANE	0B1	COL DYKE FIELD	BETHEL	ME	4026.	1314.	0.	0.04	0.04
ANE	LCI	LACONIA MUNI	LACONIA	NH	611119.	205315.	611.	3.46	5.42
ANE	EEN	DILLANT-HOPKINS	KEENE	NH	491982.	187843.	485.	2.96	4.52
ANE	BML	BERLIN MUNI	BERLIN	NH	304836.	57600.	292.	2.01*	2.41*
ANE	AFN	JAFFREY MUNI-SILVER RANCH	JAFFREY	NH	228754.	93195.	208.	1.53*	2.14*
ANE	ASH	BOIRE FIELD	NASHUA	NH	163334.	142558.	0.	6.76	2.03
ANE	6B1	SKYHAVEN	ROCHESTER	NH	162771.	63514.	0.	1.64	1.50
ANE	CWN	WHITE MOUNTAIN	NORTH CONWAY	NH	30621.	96466.	0.	0.60	0.84

ANE	CNH	CLAREMONT MUNI	CLAREMONT	NH	71116.	20256.	67.	0.46*	0.61*
ANE	HIE	WHITEFIELD REGIONAL	WHITEFIELD	NH	42096.	30140.	28.	0.81	0.48
ANE	7B3	HAMPTON AIRFIELD	HAMPTON	NH	19563.	6336.	0.	0.19	0.17
ANE	5B9	DEAN MEMORIAL	HAVERHILL	NH	3171.	6749.	0.	0.05	0.07
ANE	2B3	PARLIN FIELD	NEWPORT	NH	6667.	2176.	0.	0.07	0.06
ANE	2B4	NEWPORT STATE	NEWPORT	RI	639427.	205065.	723.	3.06	5.61
ANE	SFZ	NORTH CENTRAL STATE	SMITHFIELD	RI	176136.	158604.	2.	7.77	2.22
ANE	WST	WESTERLY STATE	WESTERLY	RI	77599.	130689.	0.	3.79	1.38
ANE	BID	BLOCK ISLAND STATE	BLOCK ISLAND	RI	61565.	125350.	1.	3.77	1.24
ANE	99B	QUONSET STATE	NORTH KINGSTOWN	RI	148561.	37549.	72.	1.90*	1.24*
ANE	RI04	RICHMOND	WEST KINGSTON	RI	3397.	1109.	0.	0.03	0.03
ANE	VSF	SPRINGFIELD STATE /HARTNESS/	SPRINGFIELD	VT	197252.	141772.	162.	1.59*	2.25*
ANE	MPV	EDWARD F KNAPP STATE	BARRE-MONTPELIER	VT	95648.	123773.	77.	1.26	1.46
ANE	RUT	RUTLAND STATE	RUTLAND	VT	47951.	120993.	1.	2.56	1.12
ANE	6B0	MIDDLEBURY STATE	MIDDLEBURY	VT	49290.	57935.	0.	0.64	0.71
ANE	6B8	CALEDONIA COUNTY	LYNDONVILLE	VT	75596.	13397.	71.	0.46*	0.59*
ANE	MVL	MORRISVILLE-STOWE STATE	MORRISVILLE	VT	69587.	12402.	65.	0.42*	0.54*
ANE	EFK	NEWPORT STATE	NEWPORT	VT	35555.	33664.	26.	0.48	0.46
ANE	1B7	FRANKLIN COUNTY	HIGHGATE	VT	43255.	7505.	42.	0.28*	0.34*
ANE	0B7	WARREN-SUGARBUSH	WARREN	VT	36693.	11979.	0.	0.37	0.32
ANE	2B9	POST MILLS	POST MILLS	VT	26579.	8675.	0.	0.27	0.23
ANE	6B5	CHAMPLAIN	BURLINGTON	VT	7511.	2452.	0.	0.07	0.07

NORTHWEST REGION

ANM	GXY	WELD COUNTY MUNI	GREELEY	CO	2718554.	573525.	2508.	16.91*	21.87*
ANM	3V5	DOWNTOWN FORT COLLINS AIRPARK	FORT COLLINS	CO	878760.	257953.	818.	5.68*	7.55*
ANM	FNL	FORT COLLINS-LOVELAND MUNI	FORT COLLINS/LOVELAND/	CO	414931.	213962.	1303.	8.81	4.18
ANM	EGE	EAGLE COUNTY	EAGLE	CO	405500.	177792.	343.	2.73*	3.88*
ANM	GUC	GUNNISON COUNTY	GUNNISON	CO	390304.	171297.	365.	2.85*	3.73*
ANM	SBS	ROUTT COUNTY STOL	STEAMBOAT SPRINGS	CO	309239.	156520.	296.	2.49*	3.09*
ANM	DRO	DURANGO-LA PLATA COUNTY	DURANGO	CO	235780.	163774.	113.	1.83	2.65
ANM	48V	TRI-COUNTY	ERIE	CO	235903.	106037.	0.	2.35	2.27
ANM	LHX	LA JUNTA MUNI	LA JUNTA	CO	272240.	66021.	222.	2.86	2.25
ANM	MTJ	MONTROSE COUNTY	MONTROSE	CO	163954.	148272.	65.	5.19	2.07
ANM	STK	CROSSON FIELD	STERLING	CO	205554.	102993.	171.	2.01	2.05
ANM	2V2	LONGMONT MUNI	LONGMONT	CO	225767.	79039.	0.	1.93	2.03
ANM	TAD	LAS ANIMAS COUNTY	TRINIDAD	CO	184592.	84770.	175.	1.45*	1.79*
ANM	1V5	BOULDER MUNI	BOULDER	CO	172139.	76101.	0.	1.81	1.65
ANM	01V	COLUMBINE	AURORA	CO	179048.	58441.	0.	1.75	1.58
ANM	LAA	LAMAR MUNI	LAMAR	CO	92215.	122514.	64.	1.82	1.43
ANM	GWS	GLENWOOD SPRINGS MUNI	GLENWOOD SPRINGS	CO	60904.	121436.	0.	1.02	1.21
ANM	HDN	YAMPA VALLEY	HAYDEN	CO	58840.	109667.	20.	2.53	1.12
ANM	00V	MEADOW LAKE	FALCON	CO	107842.	40545.	0.	1.08	0.99
ANM	CEZ	CORTEZ-MONTEZUMA COUNTY	CORTEZ	CO	28303.	112036.	15.	0.65	0.93
ANM	AKO	AKRON-WASHINGTON CO	AKRON	CO	107443.	19921.	93.	1.10	0.85
ANM	5C00	ANIMAS AIR PARK	DURANGO	CO	53197.	65257.	0.	0.69	0.79
ANM	2V5	WRAY MUNI	WRAY	CO	48773.	62381.	0.	0.62	0.74
ANM	2V1	STEVENS FIELD	PAGOSA SPRINGS	CO	34998.	67654.	0.	0.53	0.68
ANM	7V2	NORTH FORK VALLEY	PAONIA	CO	14448.	82930.	0.	0.41	0.65
ANM	2V3	MEEKER	MEEKER	CO	30238.	63006.	0.	0.48	0.62
ANM	CAG	CRAIG-MOFFAT	CRAIG	CO	65042.	25837.	0.	0.65	0.60
ANM	2V6	YUMA MUNI	YUMA	CO	42316.	45685.	0.	0.52	0.58
ANM	1V9	BLAKE FIELD	DELTA	CO	27132.	54057.	0.	0.44	0.54
ANM	C012	BRIGHTON VAN-AIRE ESTATES	BRIGHTON	CO	59259.	19339.	0.	0.60	0.52
ANM	GNB	GRANBY-GRAND COUNTY	GRANBY	CO	13333.	58318.	0.	0.33	0.48

ANM	RIL	GARFIELD COUNTY	RIFLE	CO	31665.	36899.	0.	0.40	0.46
ANM	4V0	RANGELY	RANGELY	CO	44682.	19928.	0.	0.43	0.43
ANM	08V	SAN LUIS VALLEY	MONTE VISTA	CO	29180.	25493.	0.	0.34	0.36
ANM	0V2	HARRIET ALEXANDER FIELD	SALIDA	CO	22180.	28519.	0.	0.29	0.34
ANM	LXV	LAKE COUNTY	LEADVILLE	CO	35057.	16788.	0.	0.36	0.34
ANM	1V8	LEACH	CENTER	CO	31907.	13122.	0.	0.33	0.30
ANM	3V4	FORT MORGAN MUNI	FORT MORGAN	CO	36415.	9438.	119.	0.77	0.30
ANM	3V1	BURLINGTON MUNI	BURLINGTON	CO	23237.	15580.	0.	0.25	0.26
ANM	6V3	LITTLETON	SEDALIA	CO	28733.	9379.	0.	0.28	0.25
ANM	7V9	CITY AND COUNTY	LAS ANIMAS	CO	20544.	17334.	0.	0.24	0.25
ANM	8V5	HOLYOKE	HOLYOKE	CO	21948.	13626.	0.	0.24	0.24
ANM	20V	KREMMLING	KREMMLING	CO	12444.	14689.	0.	0.16	0.18
ANM	6V6	HOPKINS-MONTROSE COUNTY	NUCLA	CO	20244.	6607.	0.	0.20	0.18
ANM	1V6	FREMONT COUNTY	CANON CITY	CO	18775.	6128.	0.	0.18	0.17
ANM	C050	ELLICOTT INTL	ELLICOTT	CO	18326.	5983.	0.	0.18	0.16
ANM	5V4	CALHAN	CALHAN	CO	18447.	6021.	0.	0.18	0.16
ANM	7V5	BRUSH MUNI	BRUSH	CO	15239.	7791.	0.	0.15	0.15
ANM	Q39	MINERAL COUNTY MEMORIAL	CREEDE	CO	12121.	3956.	0.	0.12	0.11
ANM	7V8	JULESBURG MUNI	JULESBURG	CO	10827.	6240.	0.	0.11	0.11
ANM	33V	WALDEN-JACKSON COUNTY	WALDEN	CO	8130.	2653.	0.	0.08	0.07
ANM	8V7	SPRINGFIELD MUNI	SPRINGFIELD	CO	6727.	2196.	0.	0.07	0.06
ANM	9V7	EADS MUNI	EADS	CO	6948.	2316.	0.	0.07	0.06
ANM	09V	FOWLER	FOWLER	CO	6730.	2197.	0.	0.07	0.06
ANM	7V1	BUENA VISTA MUNI	BUENA VISTA	CO	6097.	1990.	0.	0.06	0.05
ANM	8V1	DEL NORTE MUN AND CO	DEL NORTE	CO	3320.	1084.	0.	0.03	0.03
ANM	4V1	JOHNSON FIELD	WALSENBURG	CO	3572.	1166.	0.	0.04	0.03
ANM	29V	VALLEY AIRPORT	SILVER CLIFF	CO	2997.	978.	0.	0.03	0.03
ANM	04V	SAGUACHE MUNI	SAGUACHE	CO	1159.	378.	0.	0.01	0.01
ANM	COE	COEUR D ALENE AIR TERM	COEUR D ALENE	ID	780993.	239949.	690.	4.97*	6.78*
ANM	SUN	FRIEDMAN MEMORIAL	HAILEY	ID	124990.	146154.	0.	1.60	1.80
ANM	U35	CALDWELL INDUSTRIAL	CALDWELL	ID	111008.	135721.	0.	1.33	1.64
ANM	S67	NAMPA MUNI	NAMPA	ID	116434.	94512.	0.	1.36	1.40
ANM	MYL	MC CALL	MC CALL	ID	73252.	129269.	0.	1.13	1.35
ANM	S73	KAMIAH MUNI	KAMIAH	ID	63431.	106219.	0.	0.96	1.13
ANM	BYI	BURLEY MUNI	BURLEY	ID	83833.	75472.	0.	3.65	1.06
ANM	SMN	SALMON	SALMON	ID	34489.	116619.	0.	0.86	1.00
ANM	U02	MCCARLEY FLD	BLACKFOOT	ID	56830.	90255.	0.	0.83	0.98
ANM	U11	REXBURG-MADISON COUNTY	REXBURG	ID	68932.	69492.	129.	1.83	0.92
ANM	S68	OROFINO MUNI	OROFINO	ID	25625.	71310.	0.	0.49	0.64
ANM	S80	IDAHO COUNTY	GRANGEVILLE	ID	33237.	59277.	0.	0.51	0.61
ANM	S86	COUNTY-CITY	SANDPOINT	ID	43816.	42232.	0.	0.48	0.57
ANM	S87	WEISER MUNI	WEISER	ID	47585.	17976.	0.	0.49	0.44
ANM	U76	MOUNTAIN HOME MUNI	MOUNTAIN HOME	ID	44497.	19341.	0.	0.47	0.42
ANM	65S	BOUNDARY COUNTY	BONNERS FERRY	ID	29636.	33850.	0.	0.39	0.42
ANM	U59	TETON PEAKS/DRIGGS MUNI/	DRIGGS	ID	19584.	42705.	0.	0.33	0.41
ANM	U01	AMERICAN FALLS	AMERICAN FALLS	ID	35710.	25142.	0.	0.40	0.40
ANM	S83	SHOSHONE COUNTY	KELLOGG	ID	29596.	27874.	0.	0.30	0.38
ANM	U15	CHALLIS	CHALLIS	ID	13849.	40831.	0.	0.27	0.36
ANM	U73	JEROME COUNTY	JEROME	ID	32296.	15358.	0.	0.35	0.32
ANM	U12	ST ANTHONY MUNI	ST ANTHONY	ID	18230.	30168.	0.	0.27	0.32
ANM	GNG	GOODING MUNI	GOODING	ID	25385.	19531.	0.	0.30	0.30
ANM	1S1	ECKHART INTL	PORTHILL	ID	7687.	37560.	0.	0.20	0.30
ANM	S89	CRAIGMONT MUNI	CRAIGMONT	ID	30961.	10104.	0.	0.31	0.27
ANM	S78	EMMETT MUNI	EMMETT	ID	23849.	7784.	0.	0.24	0.21
ANM	U57	ARCO-BUTTE COUNTY	ARCO	ID	19066.	11041.	0.	0.21	0.20
ANM	U03	BUHL MUNI	BUHL	ID	20454.	7968.	0.	0.18	0.19
ANM	U10	PRESTON	PRESTON	ID	15217.	7410.	0.	0.16	0.15
ANM	U56	RIGBY	RIGBY	ID	14636.	5861.	0.	0.15	0.14
ANM	U82	COUNCIL MUNI	COUNCIL	ID	10578.	9076.	0.	0.13	0.13

ANM	S75	PAYETTE MUNI	PAYETTE	ID	11628.	3796.	0.	0.12	0.10
ANM	S62	HENLEY AERODROME	ATHOL	ID	10628.	3469.	0.	0.10	0.09
ANM	S66	HOMEDALE MUNI	HOMEDALE	ID	8941.	2918.	0.	0.09	0.08
ANM	U78	SODA SPRINGS MUNI	SODA SPRINGS	ID	5554.	4256.	0.	0.07	0.07
ANM	S61	ATHOL	ATHOL	ID	7721.	2520.	0.	0.08	0.07
ANM	U36	ABERDEEN MUNI	ABERDEEN	ID	7930.	2588.	0.	0.08	0.07
ANM	1U7	BEAR LAKE COUNTY	PARIS	ID	4923.	2627.	0.	0.05	0.05
ANM	1S6	PRIEST RIVER MUNI	PRIEST RIVER	ID	5292.	1727.	0.	0.05	0.05
ANM	DBS	DUBOIS MUNI	DUBOIS	ID	3333.	1088.	0.	0.03	0.03
ANM	MLS	FRANK WILEY FIELD	MILES CITY	MT	300836.	98617.	261.	3.99	2.65
ANM	OLF	WOLF POINT INTL	WOLF POINT	MT	283622.	110533.	288.	0.74*	2.62*
ANM	CTB	CUT BANK MUNI	CUT BANK	MT	248884.	71447.	228.	2.74	2.13
ANM	SDY	SIDNEY-RICHLAND MUNI	SIDNEY	MT	202255.	89058.	186.	2.48	1.94
ANM	DLN	DILLON	DILLON	MT	206166.	47367.	209.	1.51*	1.68*
ANM	BZN	GALLATIN FLD	BOZEMAN	MT	95617.	128828.	50.	1.88	1.49
ANM	BTM	BERT MOONEY	BUTTE	MT	78559.	131000.	0.	4.55	1.39
ANM	LWT	LEWISTOWN MUNI	LEWISTOWN	MT	117864.	59719.	284.	3.67	1.18
ANM	LVM	MISSION FIELD	LIVINGSTON	MT	40588.	89089.	0.	1.07	0.86
ANM	S01	CONRAD	CONRAD	MT	96557.	31908.	80.	1.23	0.85
ANM	GDV	DAWSON COMMUNITY	GLENDIVE	MT	55565.	65067.	0.	2.49	0.80
ANM	SBX	SHELBY	SHELBY	MT	41847.	43987.	0.	1.67	0.57
ANM	WYS	YELLOWSTONE	WEST YELLOWSTONE	MT	11001.	63035.	0.	0.35	0.49
ANM	S27	KALISPELL CITY	KALISPELL	MT	48761.	15915.	0.	0.51	0.43
ANM	6S5	HAMILTON	HAMILTON	MT	34711.	27821.	0.	0.42	0.42
ANM	4U5	CHOTEAU	CHOTEAU	MT	31987.	28223.	0.	0.40	0.40
ANM	PWD	SHER-WOOD	PLENTYWOOD	MT	34285.	23809.	0.	0.40	0.39
ANM	RED	RED LODGE	RED LODGE	MT	31972.	22114.	0.	0.37	0.36
ANM	MLK	MALTA	MALTA	MT	28141.	19336.	0.	0.33	0.32
ANM	S71	CHINOOK MUNI	CHINOOK	MT	32946.	15748.	0.	0.36	0.32
ANM	32S	STEVENSVILLE	STEVENSVILLE	MT	35470.	11579.	0.	0.37	0.31
ANM	MT02	FAIRGROUNDS AIRPARK	HARDIN	MT	24230.	18877.	0.	0.28	0.29
ANM	6S8	LAUREL MUN	LAUREL	MT	33285.	10863.	0.	0.34	0.29
ANM	3U6	BAKER MUNI	BAKER	MT	24531.	18158.	0.	0.29	0.28
ANM	S85	BIG SKY FIELD	CULBERTSON	MT	31110.	10154.	0.	0.32	0.27
ANM	4U6	CIRCLE TOWN COUNTY	CIRCLE	MT	29395.	9594.	0.	0.30	0.26
ANM	BDX	BROADUS	BROADUS	MT	22439.	14901.	0.	0.26	0.25
ANM	6S0	BIG TIMBER	BIG TIMBER	MT	20253.	16687.	0.	0.25	0.25
ANM	S59	LIBBY	LIBBY	MT	17609.	18367.	0.	0.23	0.24
ANM	4U3	LIBERTY COUNTY	CHESTER	MT	23131.	12544.	0.	0.26	0.24
ANM	U05	RIDDICK FIELD	PHILIPSBURG	MT	15635.	18915.	0.	0.21	0.23
ANM	8S1	POLSON	POLSON	MT	23598.	7702.	0.	0.24	0.21
ANM	9S2	SCOBEY	SCOBEY	MT	23888.	7796.	0.	0.25	0.21
ANM	3U3	ANACONDA	ANACONDA	MT	18373.	10991.	0.	0.21	0.20
ANM	1S3	TILLITT FIELD	FORSYTH	MT	21195.	6918.	0.	0.22	0.19
ANM	38S	DEER LODGE-CITY-COUNTY	DEER LODGE	MT	19323.	8820.	0.	0.21	0.19
ANM	8U8	TOWNSEND	TOWNSEND	MT	19823.	6470.	0.	0.21	0.17
ANM	9U0	TURNER	TURNER	MT	16641.	5966.	0.	0.18	0.15
ANM	6S3	COLUMBUS	COLUMBUS	MT	10499.	8421.	0.	0.13	0.13
ANM	40S	EUREKA	EUREKA	MT	13117.	4281.	0.	0.14	0.12
ANM	7S7	VALIER	VALIER	MT	9089.	2967.	0.	0.09	0.08
ANM	3U4	ST LABRE MISSION	ASHLAND	MT	3795.	6723.	0.	0.06	0.07
ANM	8U6	TERRY	TERRY	MT	5414.	1767.	0.	0.06	0.05
ANM	5U2	EKALAKA	EKALAKA	MT	5284.	1724.	0.	0.05	0.05
ANM	48S	HARLEM	HARLEM	MT	4958.	1618.	0.	0.05	0.04
ANM	S64	STANFORD	STANFORD	MT	4711.	1538.	0.	0.05	0.04
ANM	29S	GARDINER	GARDINER	MT	3724.	1215.	0.	0.04	0.03
ANM	42S	POPLAR	POPLAR	MT	2873.	938.	0.	0.03	0.03
ANM	3U8	BIG SANDY	BIG SANDY	MT	3450.	1126.	0.	0.04	0.03
ANM	5U3	BIG SKY	ENNIS	MT	1450.	473.	0.	0.01	0.01

ANM	3S2	AURORA STATE	AURORA	OR	2861942.	597135.	2639.	17.77*	22.98*
ANM	OTH	NORTH BEND MUNI	NORTH BEND	OR	1970991.	437321.	1982.	6.74	16.00
ANM	4S5	MC MINNVILLE MUNI	MC MINNVILLE	OR	1146481.	303476.	1049.	7.33*	9.63*
ANM	CVO	CORVALLIS MUNI	CORVALLIS	OR	666785.	225747.	518.	4.49	5.93
ANM	1S4	SCAPPOOSE INDUSTRIAL AIRPARK	SCAPPOOSE	OR	514667.	194922.	422.	3.16*	4.71*
ANM	S07	BEND MUNI	BEND	OR	409943.	186542.	335.	4.74	3.96
ANM	LGD	LA GRANDE MUNI	LA GRANDE	OR	402081.	165349.	388.	3.04*	3.77*
ANM	DLS	THE DALLES MUNI	THE DALLES	OR	425002.	141167.	405.	3.03*	3.76*
ANM	RDM	ROBERTS FIELD	REDMOND	OR	362245.	175710.	316.	4.84	3.57
ANM	ONP	NEWPORT MUNI	NEWPORT	OR	269098.	113113.	264.	2.25	2.54
ANM	LKV	LAKE COUNTY-LAKEVIEW	LAKEVIEW	OR	249750.	122707.	245.	2.16*	2.47*
ANM	S12	ALBANY MUNI	ALBANY	OR	161124.	157953.	0.	2.07	2.12
ANM	3S8	JOSEPHINE COUNTY /GRANTS PASS/	GRANTS PASS	OR	125129.	145904.	0.	1.71	1.80
ANM	ONO	ONTARIO MUNI	ONTARIO	OR	104988.	135877.	0.	4.91	1.60
ANM	2S6	SPORTSMAN AIRPARK	NEWBERG	OR	136655.	93507.	0.	1.40	1.53
ANM	RBG	ROSEBURG MUNI	ROSEBURG	OR	93078.	135700.	2.	4.26	1.52
ANM	S03	ASHLAND MUNI-SUMNER PARKER FIELD	ASHLAND	OR	87940.	134066.	0.	1.34	1.48
ANM	S05	BANDON STATE	BANDON	OR	77677.	130714.	0.	1.27	1.38
ANM	4S1	GOLD BEACH MUNI	GOLD BEACH	OR	73072.	129210.	0.	1.23	1.34
ANM	BNO	BURNS MUNI	BURNS	OR	67557.	127410.	0.	1.26	1.30
ANM	61S	COTTAGE GROVE STATE	COTTAGE GROVE	OR	61602.	125467.	0.	1.10	1.24
ANM	S22	HERMISTON MUNICIPAL	HERMISTON	OR	73022.	107764.	2.	2.99	1.20
ANM	7S5	INDEPENDENCE STATE	INDEPENDENCE	OR	59170.	86748.	0.	0.84	0.97
ANM	0S2	OREGON CITY AIRPARK	OREGON CITY	OR	87960.	46978.	0.	0.87	0.90
ANM	7S3	STARK'S TWIN OAKS AIRPARK	HILLSBORO	OR	93951.	30660.	0.	0.91	0.83
ANM	BOK	BROOKINGS STATE	BROOKINGS	OR	55297.	64579.	0.	0.61	0.80
ANM	4S2	HOOD RIVER	HOOD RIVER	OR	49411.	62653.	0.	0.69	0.74
ANM	S21	SUNRIVER	BEND	OR	38000.	66059.	0.	0.56	0.69
ARM	BKE	BAKER MUNI	BAKER	OR	41221.	51575.	0.	1.66	0.62
ANM	7S9	LENHARDT AIRPARK	HUBBARD	OR	61552.	20086.	0.	0.60	0.54
ANM	77S	HOBBY FIELD	CRESWELL	OR	43060.	32034.	0.	0.40	0.50
ANM	4S9	MULINO	MULINO	OR	53045.	17315.	0.	0.52	0.47
ANM	S30	LEBANON STATE	LEBANON	OR	37619.	33788.	0.	0.45	0.47
ANM	9S9	LEXINGTON	LEXINGTON	OR	28952.	37010.	0.	0.38	0.44
ANM	6S2	FLORENCE MUNI	FLORENCE	OR	18907.	47385.	0.	0.34	0.44
ANM	8S4	ENTERPRISE MUNI	ENTERPRISE	OR	16887.	40632.	0.	0.33	0.38
ANM	S45	SILETZ BAY STATE	GLENEDEN BEACH	OR	18174.	38076.	0.	0.30	0.37
ANM	3S9	CONDON STATE	CONDON	OR	24097.	29076.	0.	0.33	0.35
ANM	56S	SEASIDE STATE	SEASIDE	OR	18015.	34413.	0.	0.28	0.35
ANM	S33	CITY-COUNTY	MADRAS	OR	31955.	16370.	3.	1.21	0.32
ANM	16S	TRI-CITY STATE	MYRTLE CREEK	OR	30554.	15974.	0.	0.33	0.31
ANM	S39	PRINEVILLE	PRINEVILLE	OR	26255.	18417.	0.	0.30	0.30
ANM	5S9	ESTACADA	ESTACADA	OR	32707.	10675.	0.	0.32	0.29
ANM	U33	JOHN DAY STATE	JOHN DAY	OR	21056.	19966.	0.	0.23	0.27
ANM	26U	MC DERMITT STATE	MC DERMITT	OR	18716.	15664.	0.	0.22	0.23
ANM	2S7	CHILOQUIN STATE	CHILOQUIN	OR	10173.	24829.	0.	0.19	0.23
ANM	03S	RICHS	SANDY	OR	24178.	7890.	0.	0.23	0.21
ANM	46S	JOE CARDS AIRPARK	DALLAS	OR	15907.	10750.	0.	0.17	0.18
ANM	OR78	DANIELS FIELD	HARRISBURG	OR	11471.	15349.	0.	0.16	0.18
ANM	10S	HUTCHINSON	MOLALLA	OR	19730.	6438.	0.	0.19	0.17
ANM	S48	COUNTRY SQUIRE AIRPARK	SANDY	OR	18814.	6140.	0.	0.18	0.17
ANM	3S4	ILLINOIS VALLEY /USFS/	CAVE JUNCTION	OR	18200.	5939.	0.	0.18	0.16
ANM	S49	MILLER MEMORIAL AIRPARK	VALE	OR	12918.	9775.	0.	0.14	0.15
ANM	5S0	OAKRIDGE STATE	OAKRIDGE	OR	4533.	18158.	0.	0.10	0.15
ANM	S47	TILLAMOOK	TILLAMOOK	OR	10068.	6798.	0.	0.12	0.11
ANM	62S	CHRISTMAS VALLEY	CHRISTMAS VALLEY	OR	7532.	8017.	0.	0.09	0.10
ANM	5S1	GEORGE FELT	ROSEBURG	OR	9523.	3108.	0.	0.09	0.08
ANM	OR62	CROW-MAG	ELMIRA	OR	8375.	2733.	0.	0.08	0.07
ANM	6S4	DAVIS	GATES	OR	4834.	1577.	0.	0.05	0.04

ANM	OR06	INLAND HELICOPTERS	GRANTS PASS	OR	762.	5808.	0.	0.03	0.04
ANM	S15	TROH'S MEMORIAL AIRPARK	PORTLAND	OR	2810.	917.	0.	0.03	0.02
ANM	41S	ROGUE-AIR	SHADY COVE	OR	2240.	1399.	0.	0.02	0.02
ANM	PVU	PROVO MUNI	PROVO	UT	195080.	169036.	0.	7.27	2.42
ANM	VEL	VERNAL	VERNAL	UT	168945.	139895.	125.	2.52	2.05
ANM	LGU	LOGAN-CACHE	LOGAN	UT	121033.	144870.	0.	4.13	1.77
ANM	BTF	SALT LAKE SKYPARK	BOUNTIFUL	UT	93920.	136023.	0.	1.42	1.53
ANM	BMC	BRIGHAM CITY	BRIGHAM CITY	UT	123832.	105920.	84.	1.78	1.53
ANM	U42	SALT LAKE CITY MUNI 2	SALT LAKE CITY	UT	134209.	80020.	0.	1.51	1.42
ANM	SGU	SAINT GEORGE MUNI	ST. GEORGE	UT	66300.	126983.	1.	2.72	1.28
ANM	CDC	CEDAR CITY MUNI	CEDAR CITY	UT	57536.	122871.	8.	2.63	1.20
ANM	RIF	RICHFIELD MUNI	RICHFIELD	UT	55785.	123571.	0.	1.07	1.19
ANM	PUC	CARBON COUNTY	PRICE	UT	48095.	121025.	0.	0.97	1.12
ANM	BDG	BLANDING MUNI	BLANDING	UT	48203.	106673.	22.	1.35	1.03
ANM	KNB	KANAB MUNI	KANAB	UT	27864.	114457.	0.	0.77	0.95
ANM	69V	HUNTINGTON MUNI	HUNTINGTON	UT	27865.	114458.	0.	0.77	0.95
ANM	DTA	DELTA MUNI	DELTA	UT	25188.	111480.	0.	0.69	0.91
ANM	U20	GREEN RIVER	GREEN RIVER	UT	10418.	105966.	0.	0.55	0.77
ANM	U77	SPANISH FORK-SPRINGVILLE	SPANISH FORK	UT	45446.	69571.	0.	0.62	0.76
ANM	U43	SAN JUAN COUNTY	MONTICELLO	UT	8901.	99237.	0.	0.45	0.72
ANM	U69	DUCHESNE MUNI	DUCHESNE	UT	64706.	38877.	58.	0.46*	0.69*
ANM	36U	HEBER VALLEY	HEBER	UT	56317.	42889.	0.	0.65	0.66
ANM	BCE	BRYCE CANYON	BRYCE CANYON	UT	53543.	35399.	50.	0.54*	0.59*
ANM	74V	ROOSEVELT MUNI	ROOSEVELT	UT	7228.	81696.	0.	0.33	0.59
ANM	CNY	CANYONLANDS FIELD	MOAB	UT	21855.	61895.	0.	0.69	0.56
ANM	U55	PANGUITCH MUNI	PANGUITCH	UT	4393.	61589.	0.	0.24	0.44
ANM	ENV	WENDOVER	WENDOVER	UT	34145.	24688.	0.	0.40	0.39
ANM	41U	MANTI-EPHRAIM	MANTI	UT	10556.	41789.	0.	0.23	0.35
ANM	U27	TREMONTON MUNI	TREMONTON	UT	26871.	11581.	0.	0.27	0.26
ANM	U07	BULLFROG BASIN	GLEN CANYON NATL REC A	UT	8826.	24779.	0.	0.16	0.22
ANM	U26	BOLINDER FIELD-TOOELE VALLEY	TOOELE	UT	20648.	6741.	0.	0.20	0.18
ANM	U14	NEPHI MUNI	NEPHI	UT	12166.	3242.	0.	0.12	0.10
ANM	42U	MORGAN MUNI	MORGAN	UT	9731.	5341.	0.	0.10	0.10
ANM	44U	SALINA-GUNNISON	SALINA	UT	8637.	4329.	0.	0.09	0.09
ANM	HVE	HANKSVILLE	HANKSVILLE	UT	7665.	2502.	0.	0.07	0.07
ANM	1L9	PAROWAN	PAROWAN	UT	7666.	2502.	0.	0.07	0.07
ANM	40U	MANILA	MANILA	UT	7665.	2502.	0.	0.07	0.07
ANM	U22	HALLS CROSSING	GLEN CANYON NATL REC A	UT	5606.	3277.	0.	0.06	0.06
ANM	U52	BEAVER MUNI	BEAVER	UT	5837.	1905.	0.	0.06	0.05
ANM	1L8	HURRICANE	HURRICANE	UT	4707.	1536.	0.	0.05	0.04
ANM	1L7	ESCALANTE MUNI	ESCALANTE	UT	4580.	1495.	0.	0.04	0.04
ANM	38U	WAYNE WONDERLAND	LOA	UT	2037.	1223.	0.	0.02	0.02
ANM	PWT	KITSAP COUNTY	BREMERTON	WA	2173096.	455431.	2148.	9.53	17.46
ANM	KLS	KELSO-LONGVIEW	KELSO	WA	1134135.	196488.	987.	6.51*	8.84*
ANM	EPH	EPHRATA MUNI	EPHRATA	WA	913816.	167440.	738.	6.73	7.18
ANM	RLD	RICHLAND	RICHLAND	WA	680080.	244497.	419.	8.51	6.14
ANM	HQM	BOWERMAN	HOQUIAM	WA	593344.	199012.	503.	4.44	5.26
ANM	PUW	PULLMAN/MOSCOW REGIONAL	PULLMAN/MOSCOW,ID	WA	522310.	194358.	336.	2.48	4.76
ANM	S50	AUBURN MUNI	AUBURN	WA	448766.	251836.	0.	3.97	4.66
ANM	BLI	BELLINGHAM INTL	BELLINGHAM	WA	492608.	195431.	469.	5.11	4.57
ANM	S88	ARLINGTON	ARLINGTON	WA	402942.	235427.	0.	13.51	4.24
ANM	1S0	PUYALLUP INDUSTRIAL AIRPARK	PUYALLUP	WA	339359.	216125.	0.	3.18	3.69
ANM	59S	EVERGREEN FIELD	VANCOUVER	WA	333433.	110209.	0.	3.26	2.95
ANM	EAT	PANGBORN FIELD	WENATCHEE	WA	186394.	165129.	2.	6.76	2.34
ANM	CLM	WILLIAM R FAIRCHILD INTL	PORT ANGELES	WA	155750.	156074.	6.	5.21	2.07
ANM	60S	PEARSON AIRPARK	VANCOUVER	WA	216835.	70782.	0.	5.40	1.91
ANM	SHN	SANDERSON FIELD	SHELTON	WA	136387.	111303.	426.	2.85	1.65
ANM	S19	FRIDAY HARBOR	FRIDAY HARBOR	WA	101958.	138637.	0.	1.17	1.60

ANM	S44	SPANAWAY	SPANAWAY	WA	186129.	47180.	119.	1.35*	1.55*
ANM	75S	SKAGIT REGIONAL/BAY VIEW	BURLINGTON/MT VERNON/	WA	70736.	128451.	0.	1.18	1.32
ANM	CLS	CHEHALIS-CENTRALIA	CHEHALIS	WA	133046.	43424.	0.	1.09	1.17
ANM	ELN	BOWERS FIELD	ELLENSBURG	WA	147862.	26034.	138.	0.90*	1.16*
ANM	S17	ORCAS ISLAND	EAST SOUND	WA	37425.	117577.	0.	0.81	1.03
ANM	76S	OAK HARBOR AIR PARK	OAK HARBOR	WA	27391.	114304.	0.	0.59	0.94
ANM	S43	HARVEY FIELD	SNOHOMISH	WA	103645.	33830.	0.	0.96	0.91
ANM	S31	LOPEZ ISLAND	LOPEZ	WA	35908.	100787.	0.	0.61	0.91
ANM	0S6	CLARK COUNTY	ORCHARDS	WA	99219.	36077.	0.	1.04	0.90
ANM	07S	DEER PARK MUNI	DEER PARK	WA	100903.	32929.	0.	0.69	0.89
ANM	WA12	DE VERE FIELD	CLE ELUM	WA	18880.	98108.	0.	0.55	0.78
ANM	S95	MARTIN FIELD	COLLEGE PLACE	WA	69859.	33587.	0.	0.74	0.69
ANM	0S8	PORT ORCHARD	PORT ORCHARD	WA	78374.	25580.	0.	0.81	0.69
ANM	WA10	PORT OF CAMAS-WASHOUGAL	CAMAS	WA	67673.	22085.	0.	0.37	0.60
ANM	S60	KENMORE AIRHARBOR	KENMORE	WA	62481.	20392.	0.	0.60	0.55
ANM	BVU	BELLEVUE AIRFIELD	BELLEVUE	WA	56899.	22490.	0.	1.02	0.53
ANM	74S	ANACORTES	ANACORTES	WA	59322.	19366.	0.	0.53	0.52
ANM	14S	WESTPORT	WESTPORT	WA	13553.	58345.	0.	0.33	0.48
ANM	WA40	MOSES LAKE MUNI	MOSES LAKE	WA	54825.	17897.	0.	0.57	0.48
ANM	0S9	JEFFERSON COUNTY INTL	PORT TOWNSEND	WA	25395.	35251.	0.	0.35	0.40
ANM	S13	MARTHA LAKE	ALDERWOOD MANOR	WA	43431.	14180.	0.	0.44	0.38
ANM	S97	ANDERSON FIELD	BREWSTER	WA	1456.	17487.	0.	0.32	0.33
ANM	WA22	ELMA MUNICIPAL	ELMA	WA	9106.	20152.	0.	0.28	0.33
ANM	S42	APEX AIRPARK	SILVERDALE	WA	36383.	11877.	0.	0.37	0.32
ANM	S18	FORKS	FORKS	WA	26102.	20601.	0.	0.29	0.31
ANM	OMK	OMAK	OMAK	WA	29969.	9781.	0.	0.25	0.26
ANM	WA05	GOHEEN	BATTLE GROUND	WA	29388.	9592.	0.	0.29	0.26
ANM	S36	CREST AIRPARK	KENT	WA	29843.	10010.	0.	0.30	0.26
ANM	S40	PROSSER	PROSSER	WA	29518.	9635.	0.	0.30	0.26
ANM	S52	INTERCITY	WINTHROP	WA	26717.	8719.	0.	0.17	0.24
ANM	S70	OTHELLO MUNI	OTHELLO	WA	25417.	8296.	0.	0.25	0.22
ANM	63S	COLVILLE MUNI	COLVILLE	WA	24558.	8016.	0.	0.25	0.22
ANM	S26	OCEAN SHORES MUNI	OCEAN SHORES	WA	23935.	7810.	0.	0.24	0.21
ANM	WA51	R & K SKYRANCH	ROCHESTER	WA	21814.	7659.	0.	0.22	0.20
ANM	1S5	SUNNYSIDE MUNI	SUNNYSIDE	WA	19072.	11044.	0.	0.21	0.20
ANM	8S2	CASHMERE-DRYDEN	CASHMERE	WA	20312.	9583.	0.	0.21	0.20
ANM	S94	WHITMAN CO MEMORIAL	COLFAX	WA	21437.	6997.	0.	0.20	0.19
ANM	WA56	KURTZER FLYING SERVICE	SEATTLE	WA	20051.	6544.	0.	0.17	0.18
ANM	11S	SEKIU	SEKIU	WA	20274.	6616.	0.	0.20	0.18
ANM	TDO	TOLEDO-WINLOCK MUNI	TOLEDO	WA	19098.	6234.	0.	0.19	0.17
ANM	2S4	NEW WARDEN	WARDEN	WA	17932.	5853.	0.	0.18	0.16
ANM	S98	VISTA FIELD	KENNEWICK	WA	18679.	6098.	0.	0.19	0.16
ANM	S10	CHELAN MUNI	CHELAN	WA	13584.	9253.	0.	0.14	0.15
ANM	WA77	ENUMCLAW	ENUMCLAW	WA	17068.	5571.	0.	0.16	0.15
ANM	0S7	DOROTHY SCOTT	OROVILLE	WA	16564.	5406.	0.	0.15	0.15
ANM	WA09	BLAINE MUNI	BLAINE	WA	15687.	7370.	0.	0.17	0.15
ANM	WA14	CONNELL CITY	CONNELL	WA	16313.	5325.	0.	0.16	0.14
ANM	WAO	(NEW)	BLAINE	WA	15355.	5012.	0.	0.04	0.14
ANM	535	OKANOGAN LEGION	OKANOGAN	WA	10354.	8772.	0.	0.12	0.13
ANM	WA38	FLYING F RANCH	MONROE	WA	15228.	4971.	0.	0.15	0.13
ANM	68S	DAVENPORT	DAVENPORT	WA	13643.	4453.	0.	0.13	0.12
ANM	WA33	LYNDEN	LYNDEN	WA	13436.	4386.	0.	0.13	0.12
ANM	2S5	WATERVILLE	WATERVILLE	WA	13075.	4268.	0.	0.13	0.12
ANM	70S	MEAD FLYING SERVICE	MEAD	WA	13062.	4264.	0.	0.13	0.12
ANM	33S	PRU FIELD	RITZVILLE	WA	13285.	4336.	0.	0.13	0.12
ANM	WA69	WAX ORCHARDS	VASHON	WA	12295.	4013.	0.	0.11	0.11
ANM	2S1	VASHON ISLAND	VASHON	WA	11498.	3753.	0.	0.12	0.10
ANM	WA72	WESTERN AIRPARK INC	YELM	WA	10826.	3533.	0.	0.11	0.10
ANM	WA24	FRIDAY HARBOR SPB	FRIDAY HARBOR	WA	10039.	3276.	0.	0.08	0.09
ANM	[illegible]	[illegible]	LANGLEY	WA	8717.	3928.	0.	0.09	0.08

ANM	73S	WILLARD FIELD	TEKOA	WA	8971.	2928.	0.	0.09	0.08
ANM	S23	IONE MUNI	IONE	WA	8524.	2782.	0.	0.09	0.08
ANM	WA20	SWANSON	EATONVILLE	WA	7775.	2538.	0.	0.08	0.07
ANM	2S8	WILBUR	WILBUR	WA	8114.	2648.	0.	0.09	0.07
ANM	WA43	ODESSA MUNI	ODESSA	WA	8353.	2726.	0.	0.08	0.07
ANM	WA21	GRAND COULEE DAM	ELECTRIC CITY	WA	8101.	2644.	0.	0.06	0.07
ANM	80WA	QUINCY MUNI	QUINCY	WA	7190.	2347.	0.	0.06	0.06
ANM	WA35	CEDAR GROVE AIRPARK	MAPLE VALLEY	WA	5268.	1720.	0.	0.05	0.05
ANM	S93	CLE ELUM	CLE ELUM	WA	6198.	2023.	0.	0.05	0.05
ANM	2S9	WILLAPA HARBOR	SOUTH BEND/RAYMOND/	WA	5020.	1638.	0.	0.04	0.04
ANM	WA4	FERRY COUNTY	REPUBLIC	WA	3503.	1143.	0.	0.03	0.03
ANM	WA15	COULEE CITY	COULEE CITY	WA	523.	171.	0.	0.01	0.00
ANM	GCC	GILLETTE-CAMPBELL COUNTY	GILLETE	WY	774168.	234677.	779.	5.70*	6.70*
ANM	COD	CODY MUNI	CODY	WY	375192.	166536.	375.	2.90*	3.60*
ANM	SHR	SHERIDAN COUNTY	SHERIDAN	WY	330111.	167556.	291.	4.02	3.31
ANM	RKS	ROCK SPRINGS-SWEETWATER COUNTY	ROCK SPRINGS	WY	332127.	164702.	314.	3.36	3.30
ANM	JAC	JACKSON HOLE	JACKSON	WY	301308.	160165.	280.	3.16	3.07
ANM	RWL	RAWLINS MUNI	RAWLINS	WY	243696.	146368.	244.	2.07*	2.59*
ANM	RIW	RIVERTON REGIONAL	RIVERTON	WY	214949.	143896.	203.	2.40	2.38
ANM	LAR	GENERAL BREES FIELD	LARAMIE	WY	207849.	143611.	190.	2.15	2.34
ANM	GEY	SOUTH BIG HORN COUNTY	GREYBULL	WY	78587.	131012.	0.	1.31	1.39
ANM	EVW	EVANSTON MUNI	EVANSTON	WY	60628.	125150.	0.	1.12	1.23
ANM	BPI	BIG PINEY MUNI	BIG PINEY	WY	62842.	108255.	50.	1.29	1.14
ANM	DGW	CONVERSE COUNTY	DOUGLAS	WY	46586.	105878.	0.	0.82	1.01
ANM	WRL	WORLAND MUNI	WORLAND	WY	23116.	112907.	0.	0.74	0.90
ANM	AFO	AFTON MUNI	AFTON	WY	24370.	98657.	0.	0.59	0.82
ANM	POY	POWELL MUNI	POWELL	WY	21150.	97503.	0.	0.56	0.79
ANM	TOR	TORRINGTON MUNI	TORRINGTON	WY	28419.	80736.	0.	0.55	0.73
ANM	BYG	BUFFALO MUNI	BUFFALO	WY	40926.	60042.	57.	1.48	0.67
ANM	U68	NORTH BIG HORN COUNTY	COWLEY/LOVELL/BYRON	WY	21085.	61427.	0.	0.40	0.55
ANM	PNA	RALPH WENZ FIELD	PINEDALE	WY	22704.	55231.	0.	0.40	0.52
ANM	ECS	MONDELL FIELD	NEWCASTLE	WY	29996.	44517.	70.	0.96	0.50
ANM	SAA	SHIVELY FIELD	SARATOGA	WY	19230.	54290.	0.	0.37	0.49
ANM	EAN	PHIFER AIRFIELD	WHEATLAND	WY	38997.	12728.	0.	0.40	0.34
ANM	FBR	FORT BRIDGER	FORT BRIDGER	WY	28284.	9019.	27.	0.19*	0.25*
ANM	LSK	LUSK MUNI	LUSK	WY	11653.	18167.	0.	0.17	0.20
ANM	THP	HOT SPRINGS CO-THERMOPOLIS MUNI	THERMOPOLIS	WY	19668.	6401.	0.	0.20	0.17
ANM	EMM	KEMMERER MUNI	KEMMERER	WY	13468.	4395.	0.	0.14	0.12
ANM	HAD	HARFORD FIELD	CASPER	WY	11119.	3630.	0.	0.11	0.10
ANM	46U	ALPINE	ALPINE	WY	6403.	2090.	0.	0.06	0.06
ANM	U25	DUBOIS MUNI	DUBOIS	WY	6203.	2024.	0.	0.06	0.05
ANM	79V	EVANS	LARAMIE	WY	4977.	1625.	0.	0.05	0.04

SOUTHERN REGION

ASO	BFM	BROOKLEY	MOBILE	AL	1125059.	241534.	1135.	7.06*	9.08*
ASO	DCU	PRYOR FIELD	DECATUR	AL	848074.	257420.	743.	5.31	7.35
ASO	MSL	MUSCLE SHOALS	MUSCLE SHOALS	AL	848344.	245244.	831.	5.60	7.27
ASO	ANB	ANNISTON-CALHOUN COUNTY	ANNISTON	AL	640729.	207344.	692.	3.19	5.63
ASO	21A	SHELBY COUNTY	ALABASTER	AL	541328.	165803.	491.	3.43*	4.70*
ASO	GAD	GADSDEN MUNI	GADSDEN	AL	437185.	185995.	379.	2.66	4.14
ASO	AUO	AUBURN-OPELIKA	AUBURN	AL	375827.	173357.	342.	2.66	3.65
ASO	ASN	TALLADEGA MUNI	TALLADEGA	AL	427894.	96414.	410.	2.85	3.48
ASO	TOI	TROY MUNI	TROY	AL	405232.	72941.	396.	3.56*	3.18*
ASO	71J	BLACKWELL FIELD	OZARK	AL	314398.	101285.	277.	2.04	2.76
ASO	39J	MIDDLETON FIELD	EVERGREEN	AL	290377.	93519.	61.	12.31	2.55
ASO	08A	WETUMPKA MUNI	WETUMPKA	AL	313436.	63146.	274.	1.95	2.50

ASO	1A8	WALKER COUNTY	JASPER	AL	299022.	51804.	279.	[illegible]	[illegible]
ASO	EUF	WEEDON FIELD	EUFAULA	AL	279933.	45546.	276.	1.47	2.16
ASO	SCD	LEE MERKLE FLD	SYLACAUGA	AL	253004.	68050.	217.	1.52*	2.13*
ASO	ALX	THOMAS C RUSSELL FLD	ALEXANDER CITY	AL	149109.	134281.	120.	1.47*	1.88*
ASO	12J	BREWTON MUNI	BREWTON	AL	195548.	79953.	137.	3.26	1.83
ASO	M82	HUNTSVILLE AIRPORT NORTH	HUNTSVILLE	AL	197757.	60530.	161.	1.23*	1.72*
ASO	1R8	BAY MINETTE MUNI	BAY MINETTE	AL	195109.	34904.	175.	1.01	1.53
ASO	2A3	BESSEMER	BESSEMER	AL	137208.	59500.	0.	5.24	1.31
ASO	1A9	AUTAUGA COUNTY	PRATTVILLE	AL	106206.	34665.	0.	1.03	0.94
ASO	8A0	ALBERTVILLE MUNI	ALBERTVILLE	AL	116217.	22174.	96.	0.68*	0.92*
ASO	PLR	ST CLAIR COUNTY	PELL CITY	AL	110886.	24963.	66.	1.15*	0.90*
ASO	EDN	ENTERPRISE MUNI	ENTERPRISE	AL	100643.	32858.	0.	0.94	0.89
ASO	4R4	FAIRHOPE MUNI	FAIRHOPE	AL	43111.	61148.	5.	1.78	0.69
ASO	7A2	DEMOPOLIS MUNI	DEMOPOLIS	AL	85963.	15642.	76.	0.49*	0.68*
ASO	SEM	CRAIG FIELD	SELMA	AL	64698.	28111.	0.	0.62	0.62
ASO	HAB	MARION COUNTY	HAMILTON	AL	65429.	18528.	53.	0.57	0.56
ASO	A04	CENTRE MUNI	CENTRE	AL	63133.	11859.	53.	0.46	0.50
ASO	06A	MOTON FIELD	TUSKEGEE	AL	30580.	42033.	12.	0.60	0.48
ASO	3A1	FOLSOM FIELD	CULLMAN	AL	54597.	14296.	171.	1.03	0.46
ASO	1M4	POSEY FIELD	HALEYVILLE	AL	55570.	10889.	44.	0.38	0.44
ASO	PRN	GREENVILLE MUNI	GREENVILLE	AL	44040.	19452.	41.	0.31*	0.42*
ASO	M22	RUSSELLVILLE MUNI	RUSSELLVILLE	AL	44865.	14643.	0.	0.43	0.40
ASO	0R1	ATMORE MUNI	ATMORE	AL	44369.	14483.	0.	0.41	0.39
ASO	79J	ANDALUSIA-OPP	ANDALUSIA & OPP	AL	20786.	23654.	0.	0.27	0.30
ASO	MVC	MONROE COUNTY	MONROEVILLE	AL	36674.	8239.	23.	0.30	0.30
ASO	5M0	ROUNTREE FIELD	HARTSELLE	AL	24992.	17012.	0.	0.27	0.28
ASO	26A	ASHLAND/LINEVILLE	ASHLAND/LINEVILLE	AL	11535.	24745.	0.	0.17	0.24
ASO	8A1	GUNTERSVILLE MUNI	GUNTERSVILLE	AL	16753.	17274.	0.	0.20	0.23
ASO	7A3	LANETT MUNI	LANETT	AL	23824.	7276.	79.	0.52	0.21
ASO	M38	HAZEL GREEN	HAZEL GREEN	AL	21240.	6933.	0.	0.21	0.19
ASO	33J	GENEVA MUNI	GENEVA	AL	16712.	11078.	0.	0.20	0.18
ASO	0J6	HEADLAND MUNI	HEADLAND	AL	19311.	6304.	0.	0.19	0.17
ASO	5R4	FOLEY MUNI	FOLEY	AL	18958.	6188.	0.	0.19	0.17
ASO	20A	ROBBINS FIELD	ONEONTA	AL	16614.	5424.	0.	0.16	0.15
ASO	AL15	JACK EDWARDS	GULF SHORES	AL	16716.	5456.	0.	0.15	0.15
ASO	02A	GRAGG FIELD	CLANTON	AL	16983.	5543.	0.	0.17	0.15
ASO	09A	BUTLER-CHOCTAW COUNTY	BUTLER	AL	15566.	5081.	0.	0.15	0.14
ASO	7A0	GREENSBORO MUNI	GREENSBORO	AL	14367.	4690.	0.	0.14	0.13
ASO	4A9	ISBELL FIELD	FORT PAYNE	AL	12226.	3991.	0.	0.12	0.11
ASO	AIV	GEORGE DOWNER	ALICEVILLE	AL	12286.	4010.	0.	0.12	0.11
ASO	4A6	SCOTTSBORO MUNI	SCOTTSBORO	AL	10904.	3559.	0.	0.11	0.10
ASO	0A8	BIBB COUNTY	CENTREVILLE	AL	11893.	3882.	0.	0.12	0.10
ASO	14J	ELBA MUNI	ELBA	AL	9976.	3256.	0.	0.10	0.09
ASO	AL08	VAIDEN FIELD	MARION	AL	9401.	3069.	0.	0.09	0.08
ASO	M95	RICHARD ARTHUR FIELD	FAYETTE	AL	6790.	5034.	0.	0.08	0.08
ASO	4R3	JACKSON MUNI	JACKSON	AL	7229.	2359.	0.	0.07	0.06
ASO	4R9	DAUPHIN ISLAND	DAUPHIN ISLAND	AL	5667.	1850.	0.	0.05	0.05
ASO	23A	MALLARD	YORK	AL	3963.	1294.	0.	0.04	0.03
ASO	TIX	TITUSVILLE-COCOA	TITUSVILLE	FL	1592981.	346963.	1526.	10.02*	12.89*
ASO	34J	NEW SMYRNA BEACH MUNI	NEW SMYRNA BEACH	FL	1142448.	229706.	1013.	6.45*	9.12*
ASO	81J	DESTIN-FT WALTON BEACH	DESTIN	FL	1139185.	222809.	1412.	7.17*	9.05*
ASO	SFB	SANFORD	SANFORD	FL	947404.	176231.	867.	5.51*	7.47*
ASO	LAL	LAKELAND MUNI	LAKELAND	FL	778472.	272770.	504.	10.93	6.98
ASO	MTH	MARATHON FLIGHT STRIP	MARATHON	FL	734861.	227505.	683.	4.71*	6.39*
ASO	FPR	ST LUCIE COUNTY	FORT PIERCE	FL	677898.	221222.	0.	3.66	5.97
ASO	GIF	WINTER HAVEN'S GILBERT	WINTER HAVEN	FL	682839.	126278.	626.	4.24*	5.38*
ASO	X47	FLAGLER COUNTY	BUNNELL	FL	675748.	126748.	592.	3.84*	5.33*
ASO	SGJ	ST AUGUSTINE	ST AUGUSTINE	FL	645825.	149669.	532.	4.84	5.2[illegible]
ASO	CEW	BOB SIKES	CRESTVIEW	FL	533884.	101560.	723.	3.02*	4.22*

ASO	OCF	OCALA MUNI /JIM TAYLOR FIELD/	OCALA	FL	419037.	187460.	374.	5.39	4.03
ASO	OMN	MUNICIPAL AIRPORT, ORMOND BEACH	ORMOND BEACH	FL	474992.	108607.	396.	4.07	3.88
ASO	LNA	PALM BEACH COUNTY PARK	WEST PALM BEACH	FL	344749.	187701.	178.	5.96	3.54
ASO	TPF	PETER O KNIGHT	TAMPA	FL	331886.	90357.	275.	4.11	2.81
ASO	APF	NAPLES MUNI	NAPLES	FL	195195.	169066.	0.	8.81	2.42
ASO	COI	MERRITT ISLAND	COCOA	FL	207236.	136809.	0.	2.19	2.29
ASO	MAI	MARIANNA MUNI	MARIANNA	FL	269371.	62583.	319.	1.30	2.21
ASO	VNC	VENICE MUNI	VENICE	FL	228693.	97978.	0.	2.24	2.17
ASO	BCT	BOCA RATON PUBLIC	BOCA RATON	FL	181367.	141778.	0.	1.99	2.15
ASO	MKY	MARCO ISLAND	MARCO ISLAND	FL	178638.	134398.	166.	1.58*	2.08*
ASO	SUA	WITHAM FIELD	STUART	FL	180617.	133059.	0.	1.95	2.08
ASO	X26	SEBASTIAN MUNI	SEBASTIAN	FL	227274.	77005.	0.	2.17	2.02
ASO	X51	HOMESTEAD GENERAL AVIATION	HOMESTEAD	FL	225542.	73620.	0.	2.15	1.99
ASO	X17	PLANT CITY MUNI	PLANT CITY	FL	204762.	55517.	136.	2.05	1.73
ASO	BKV	HERNANDO COUNTY	BROOKSVILLE	FL	181406.	65864.	133.	2.05	1.64
ASO	PGD	CHARLOTTE COUNTY	PUNTA GORDA	FL	105108.	139667.	0.	4.65	1.63
ASO	CLW	CLEARWATER EXECUTIVE	CLEARWATER	FL	178216.	66885.	0.	1.71	1.63
ASO	PHK	PALM BEACH CO GLADES	PAHOKEE	FL	164075.	73055.	92.	3.12	1.58
ASO	X46	OPA LOCKA WEST	MIAMI	FL	163285.	53301.	0.	1.55	1.44
ASO	DED	DELAND MUNI-SIDNEY H TAYLOR FLD	DELAND	FL	145860.	65096.	0.	3.93	1.40
ASO	23J	HERLONG	JACKSONVILLE	FL	145903.	59295.	0.	1.42	1.36
ASO	ISM	KISSIMMEE MUNI	KISSIMMEE	FL	79836.	122863.	1.	3.24	1.35
ASO	X16	VANDENBERG	TAMPA	FL	144031.	55723.	0.	1.39	1.33
ASO	SEF	SEBRING AIRPORT AND INDUSTRIAL PARK	SEBRING	FL	153315.	45345.	0.	0.66	1.32
ASO	LEE	LEESBURG MUNI	LEESBURG	FL	107793.	75985.	0.	1.15	1.22
ASO	X59	VALKARIA	VALKARIA	FL	135494.	44234.	0.	0.59	1.19
ASO	68J	TALLAHASSEE COMMERCIAL	TALLAHASSEE /HAVANA/	FL	134493.	44295.	118.	0.82*	1.19*
ASO	BOW	BARTOW MUNI	BARTOW	FL	98666.	73009.	0.	1.07	1.14
ASO	82J	FERGUSON	PENSACOLA	FL	113639.	45780.	0.	1.11	1.06
ASO	24J	SUWANNEE COUNTY	LIVE OAK	FL	27408.	114310.	0.	0.77	0.94
ASO	31J	LAKE CITY MUNI	LAKE CITY	FL	39254.	94367.	19.	1.52	0.89
ASO	X21	ARTHUR DUNN AIR PARK	TITUSVILLE	FL	72862.	25373.	0.	0.70	0.65
ASO	AVO	AVON PARK MUNI	AVON PARK	FL	52050.	31539.	0.	0.54	0.56
ASO	28J	KAY LARKIN	PALATKA	FL	46878.	32784.	0.	0.50	0.53
ASO	55J	FERNANDINA BEACH MUNI	FERNANDINA BEACH	FL	53383.	26110.	0.	0.53	0.53
ASO	2J9	QUINCY MUNI	QUINCY	FL	58290.	21902.	0.	0.56	0.53
ASO	OBE	OKEECHOBEE COUNTY	OKEECHOBEE	FL	46289.	26815.	0.	0.47	0.49
ASO	2R4	MILTON T FIELD	MILTON	FL	50313.	22273.	0.	0.50	0.48
ASO	X07	LAKE WALES MUNI	LAKE WALES	FL	37521.	35469.	0.	0.43	0.48
ASO	X39	TAMPA DOWNS	LUTZ	FL	42515.	19728.	0.	0.42	0.41
ASO	X06	ARCADIA MUNI	ARCADIA	FL	44385.	16269.	0.	0.43	0.40
ASO	IMM	IMMOKALEE	IMMOKALEE	FL	43673.	17132.	0.	0.43	0.40
ASO	X53	CLEWISTON	CLEWISTON	FL	32308.	16803.	0.	0.31	0.33
ASO	CTY	CROSS CITY	CROSS CITY	FL	34707.	9761.	26.	0.55	0.30
ASO	X14	LABELLE MUNICIPAL	LABELLE	FL	28076.	14983.	0.	0.28	0.29
ASO	ZPH	ZEPHYRHILLS MUNI	ZEPHYRHILLS	FL	27479.	11870.	0.	0.27	0.26
ASO	40J	PERRY-FOLEY	PERRY	FL	15277.	22470.	0.	0.70	0.25
ASO	X33	SILVER SPRINGS FLY-N STRIP	SILVER SPRINGS	FL	25134.	9985.	0.	0.24	0.23
ASO	42J	KEYSTONE AIRPARK	KEYSTONE HEIGHTS	FL	24805.	9296.	0.	0.27	0.23
ASO	X10	BELLE GLADE STATE/MARPT/	BELLE GLADE	FL	24463.	7985.	0.	0.23	0.22
ASO	54J	DEFUNIAK SPRINGS	DEFUNIAK SPRINGS	FL	21594.	8217.	0.	0.21	0.20
ASO	X60	WILLISTON MUNI	WILLISTON	FL	18986.	9105.	0.	0.19	0.19
ASO	CDK	GEORGE T LEWIS	CEDAR KEY	FL	18552.	8929.	0.	0.18	0.18
ASO	X01	EVERGLADES	EVERGLADES	FL	12635.	4123.	0.	0.12	0.11
ASO	01J	HILLIARD AIRPARK	HILLIARD	FL	11095.	3621.	0.	0.11	0.10
ASO	0J9	CALHOUN COUNTY	BLOUNTSTOWN	FL	9357.	5929.	0.	0.10	0.10
ASO	X22	WAUCHULA MUNI	WAUCHULA	FL	10652.	3477.	0.	0.10	0.09
ASO	X13	CARRABELLE FLIGHT STRIP	CARRABELLE	FL	6787.	2215.	0.	0.06	0.06
ASO	AAF	APALACHICOLA MUNI	APALACHICOLA	FL	5459.	3068.	0.	0.06	0.06
ASO	2IS	AIRGLADES	CLEWISTON	FL	2343.	765.	0.	0.02	0.02

ASO	WDR	WINDER	WINDER	GA	408643.	67449.	341.	2.34	3.16
ASO	8A4	MCCOLLUM	MARIETTA	GA	335324.	97184.	956.	6.19	2.87
ASO	SBO	EMANUEL COUNTY	SWAINSBORO	GA	343522.	61878.	288.	1.87*	2.69*
ASO	AMG	BACON COUNTY	ALMA	GA	300431.	52397.	260.	1.71	2.34
ASO	RMG	RICHARD B RUSSELL	ROME	GA	187233.	142301.	137.	2.37	2.19
ASO	DNL	DANIEL FIELD	AUGUSTA	GA	186376.	115569.	158.	1.27*	2.01*
ASO	02J	CRISP COUNTY-CORDELE	CORDELE	GA	246533.	45558.	200.	1.56	1.94
ASO	17A	GWINNETT COUNTY	LAWRENCEVILLE	GA	220721.	67654.	437.	4.60	1.92
ASO	AYS	WAYCROSS-WARE COUNTY	WAYCROSS	GA	205189.	67606.	172.	1.19*	1.81*
ASO	4A4	CORNELIUS-MOORE FIELD	CEDARTOWN	GA	229544.	39764.	202.	1.33*	1.79*
ASO	BQK	GLYNCO JETPORT	BRUNSWICK	GA	122448.	141056.	0.	1.49	1.75
ASO	LGC	CALLAWAY	LA GRANGE	GA	208997.	39429.	184.	1.24	1.65
ASO	MAC	HERBERT SMART DOWNTOWN	MACON	GA	184622.	58165.	153.	1.08*	1.61*
ASO	PIM	CALLAWAY GARDENS-HARRIS COUNTY	PINE MOUNTAIN	GA	185729.	31923.	170.	1.36	1.45
ASO	TOC	TOCCOA	TOCCOA	GA	168158.	35150.	121.	2.05	1.35
ASO	CCO	NEWNAN COWETA COUNTY	NEWN	GA	155517.	40148.	515.	3.52	1.30
ASO	CTJ	WEST GEORGIA REGIONAL	CARROLLTON	GA	142485.	50292.	362.	4.30	1.28
ASO	VDI	VIDALIA MUNI	VIDALIA	GA	149371.	27214.	123.	0.92	1.17
ASO	GVL	LEE GILMER MEMORIAL	GAINESVILLE	GA	129640.	46494.	12.	3.59	1.17
ASO	MGR	MOULTRIE MUNICIPAL	MOULTRIE	GA	74791.	96950.	222.	1.67	1.14
ASO	DNN	DALTON MUNI	DALTON	GA	96335.	49900.	0.	3.32	0.97
ASO	DBN	DUBLIN MUNI	DUBLIN	GA	115964.	22130.	90.	0.95	0.92
ASO	6A0	CARTERSVILLE	CARTERSVILLE	GA	113105.	24259.	72.	0.75*	0.91*
ASO	2A9	FALCON FLD	PEACHTREE CITY	GA	103062.	27106.	317.	2.12	0.86
ASO	9A1	COVINGTON MUNI	COVINGTON	GA	101542.	27777.	261.	1.92	0.86
ASO	ACJ	SOUTHER FIELD	AMERICUS	GA	83427.	28618.	0.	0.77	0.74
ASO	TBR	STATESBORO MUNI	STATESBORO	GA	64427.	45594.	0.	1.34	0.73
ASO	9A7	SOUTH EXPRESSWAY	JONESBORO	GA	83154.	27145.	0.	0.77	0.73
ASO	54A	PERRY-FORT VALLEY	PERRY	GA	72690.	23728.	0.	1.75	0.64
ASO	52A	MADISON MUNI	MADISON	GA	76255.	13095.	68.	0.46*	0.59*
ASO	TVI	THOMASVILLE MUNI	THOMASVILLE	GA	67481.	19632.	116.	1.33	0.58
ASO	CZL	TOM B. DAVID FLD	CALHOUN	GA	64646.	21099.	0.	0.59	0.57
ASO	48A	COCHRAN	COCHRAN	GA	67299.	14968.	40.	0.44	0.55
ASO	18J	DOUGLAS MUNI	DOUGLAS	GA	45356.	31675.	0.	1.07	0.51
ASO	2A4	WASHINGTON-WILKES COUNTY	WASHINGTON	GA	57049.	10044.	49.	0.37	0.45
ASO	TMA	HENRY TIFT MYERS	TIFTON	GA	49392.	14352.	86.	0.77	0.42
ASO	09J	JEKYLL ISLAND	JEKYLL ISLAND	GA	52077.	9064.	46.	0.45*	0.41*
ASO	27A	ELBERT COUNTY-PATZ FIELD	ELBERTON	GA	48912.	13496.	120.	0.81	0.41
ASO	CXU	CAMILLA-MITCHELL COUNTY	CAMILLA	GA	45115.	14729.	0.	0.66	0.40
ASO	4J2	BERRIEN CO	NASHVILLE	GA	34937.	24438.	0.	0.36	0.39
ASO	MLJ	BALDWIN COUNTY	MILLEDGEVILLE	GA	47817.	9223.	37.	0.39	0.38
ASO	84A	MATHIS	CUMMING	GA	42726.	13948.	0.	0.40	0.38
ASO	2A2	REGINALD GRANT MEMORIAL	THOMASTON	GA	48826.	8407.	43.	0.29*	0.38*
ASO	2J3	LOUISVILLE MUNICIPAL	LOUISVILLE	GA	41757.	13630.	0.	0.38	0.37
ASO	20J	COMMODORE-DECATUR	BAINBRIDGE	GA	37553.	18463.	0.	0.36	0.37
ASO	46J	HAZLEHURST	HAZLEHURST	GA	38283.	12496.	0.	1.01	0.34
ASO	75J	TURNER COUNTY	ASHBURN	GA	32064.	19692.	0.	0.32	0.34
ASO	70J	CAIRO-GRADY COUNTY	CAIRO	GA	33741.	17248.	17.	0.25*	0.34*
ASO	50A	HABERSHAM COUNTY	CORNELIA	GA	37116.	12115.	0.	1.12	0.33
ASO	16J	DAWSON MUNI	DAWSON	GA	32547.	10624.	0.	0.30	0.29
ASO	FZG	FITZGERALD MUNI	FITZGERALD	GA	33045.	10787.	0.	0.78	0.29
ASO	07J	EASTMAN-DODGE COUNTY	EASTMAN	GA	37024.	6847.	30.	0.20*	0.29*
ASO	2J7	BURKE COUNTY	WAYNESBORO	GA	29260.	9552.	0.	0.27	0.26
ASO	8A9	SOUTH FULTON SKY PORT	FAIRBURN	GA	28200.	9206.	0.	0.26	0.25
ASO	5A2	WARNER ROBINS AIRPARK	WARNER ROBINS	GA	28468.	9294.	0.	0.27	0.25
ASO	15J	COOK COUNTY	ADEL	GA	26087.	8514.	0.	0.24	0.23
ASO	4J6	ST MARYS	ST MARYS	GA	25003.	8160.	0.	0.23	0.22
ASO	11J	EARLY COUNTY	BLAKELY	GA	24577.	8022.	0.	0.23	0.22
ASO	30J	BAXLEY MUNI	BAXLEY	GA	24491.	7993.	0.	1.06	0.22

ASO	A06	MONROE MUNI	MONROE	GA	22818.	7448.	0.	0.21	0.20
ASO	46A	BLAIRSVILLE	BLAIRSVILLE	GA	21626.	7059.	0.	0.20	0.19
ASO	SYV	SYLVESTER	SYLVESTER	GA	20506.	6695.	0.	0.19	0.18
ASO	6A2	GRIFFIN-SPALDING COUNTY	GRIFFIN	GA	20695.	6756.	0.	0.19	0.18
ASO	53A	MONTEZUMA MUNI	MONTEZUMA	GA	20481.	6685.	0.	0.19	0.18
ASO	17J	DONALSONVILLE MUNI	DONALSONVILLE	GA	19748.	6446.	0.	0.18	0.17
ASO	2J2	LIBERTY COUNTY	HINESVILLE	GA	11338.	14201.	0.	0.14	0.17
ASO	MQW	TELFAIR-WHEELER	MCRAE	GA	19518.	4598.	10.	0.15	0.16
ASO	4J5	QUITMAN BROOKS COUNTY	QUITMAN	GA	18288.	5971.	0.	0.17	0.16
ASO	65J	WRENS MEMORIAL	WRENS	GA	14629.	4775.	0.	0.13	0.13
ASO	BGE	DECATUR COUNTY INDUSTRIAL AIR PARK	BAINBRIDGE	GA	14950.	4879.	0.	0.15	0.13
ASO	56J	PLANTATION ARPK	SYLVANIA	GA	14389.	4697.	0.	0.13	0.13
ASO	19A	JACKSON COUNTY	JEFFERSON	GA	13895.	4535.	0.	0.13	0.12
ASO	2J4	METTER MUNI	METTER	GA	12922.	4218.	0.	0.12	0.11
ASO	5A9	ROOSEVELT MEMORIAL	WARM SPRINGS	GA	12679.	4139.	0.	0.12	0.11
ASO	6A1	BUTLER MUNI	BUTLER	GA	11550.	3771.	0.	0.11	0.10
ASO	19J	HOMERVILLE	HOMERVILLE	GA	11313.	3692.	0.	0.10	0.10
ASO	9A5	BARWICK LAFAYETTE	LAFAYETTE	GA	11019.	3597.	0.	0.10	0.10
ASO	RVJ	REIDSVILLE	REIDSVILLE	GA	10483.	3421.	0.	0.45	0.09
ASO	2J1	CLAXTON-EVANS COUNTY	CLAXTON	GA	8633.	2817.	0.	0.08	0.08
ASO	18A	FRANKLIN COUNTY	CANON	GA	5411.	1766.	0.	0.05	0.05
ASO	2J5	MILLEN	MILLEN	GA	6024.	1966.	0.	0.06	0.05
ASO	25J	CUTHBERT-RANDOLPH	CUTHBERT	GA	5484.	1790.	0.	0.05	0.05
ASO	4J1	BRANTLEY COUNTY	NAHUNTA	GA	6094.	1989.	0.	0.06	0.05
ASO	47A	CHEROKEE COUNTY	CANTON	GA	4810.	15[illegible].	0.	0.04	0.04
ASO	49A	GILMER COUNTY	ELLIJAY	GA	3170.	1035.	0.	0.03	0.03
ASO	JES	JESUP-WAYNE COUNTY	JESUP	GA	2535.	828.	0.	0.07	0.02
ASO	LOZ	LONDON-CORBIN ARPT-MAGEE FLD	LONDON	KY	1363390.	313811.	1320.	8.20	11.14
ASO	FFT	CAPITAL CITY	FRANKFORT	KY	1013889.	288060.	918.	9.72	8.65
ASO	I26	HENDERSON CITY-COUNTY	HENDERSON	KY	287105.	103273.	249.	1.77*	2.59*
ASO	BWG	BOWLING GREEN-WARREN COUNTY	BOWLING GREEN	KY	202625.	144266.	159.	1.76	2.30
ASO	0I9	BEN FLOYD FIELD	ELIZABETHTOWN	KY	211288.	114647.	197.	1.62*	2.17*
ASO	2I0	MADISONVILLE MUNI	MADISONVILLE	KY	185268.	122064.	172.	1.50	2.04
ASO	GLW	GLASGOW MUNI	GLASGOW	KY	174992.	109391.	152.	1.49	1.89
ASO	0I6	TAYLOR COUNTY	CAMPBELLSVILLE	KY	149409.	116644.	136.	1.22*	1.77*
ASO	SME	SOMERSET-PULASKI COUNTY	SOMERSET	KY	84109.	74300.	0.	3.65	1.05
ASO	I31	GOODALL FIELD	DANVILLE	KY	36024.	117120.	0.	0.85	1.02
ASO	5I0	PIKEVILLE-PIKE COUNTY	PIKEVILLE	KY	44321.	96202.	0.	0.69	0.93
ASO	1A6	MIDDLESBORO-BELL COUNTY	MIDDLESBORO	KY	24837.	88374.	0.	0.49	0.75
ASO	6M5	HANCOCK AIRFIELD	HAWESVILLE	KY	90954.	15769.	83.	0.54*	0.71*
ASO	I37	HAZARD	HAZARD	KY	33443.	68011.	0.	0.49	0.67
ASO	I28	ASHLAND-BOYD COUNTY	ASHLAND	KY	50599.	31494.	92.	0.97	0.55
ASO	1M8	HOPKINSVILLE-CHRISTIAN COUNTY	HOPKINSVILLE	KY	31076.	50540.	0.	0.42	0.54
ASO	BRY	SAMUELS FIELD	BARDSTOWN	KY	16186.	63749.	0.	0.77	0.53
ASO	FGX	FLEMING-MASON	FLEMINGSBURG	KY	30189.	39007.	0.	1.27	0.46
ASO	0I3	MT STERLING-MONTGOMERY COUNTY	MOUNT STERLING	KY	17960.	43817.	0.	0.29	0.41
ASO	M25	MAYFIELD GRAVES COUNTY	MAYFIELD	KY	23392.	35358.	70.	0.53	0.39
ASO	4M7	RUSSELLVILLE-LOGAN COUNTY	RUSSELLVILLE	KY	39851.	18952.	139.	1.06	0.39
ASO	3I6	PAINTSVILLE-PRESTONSBURG-COMBS FIELD	PAINTSVILLE	KY	34209.	12946.	0.	0.33	0.31
ASO	M21	MUHLENBERG COUNTY	GREENVILLE	KY	27591.	17687.	0.	0.95	0.30
ASO	M34	KENTUCKY DAM STATE PARK	GILBERTSVILLE	KY	31512.	10284.	0.	0.30	0.28
ASO	0I8	CYNTHIANA-HARRISON COUNTY	CYNTHIANA	KY	25467.	14237.	0.	0.26	0.26
ASO	BRG	WHITESBURG MUNI	WHITESBURG	KY	18698.	17775.	0.	0.21	0.24
ASO	I35	TUCKER-GUTHRIE MEMORIAL	HARLAN	KY	17083.	17815.	0.	0.20	0.23
ASO	I39	MADISON	RICHMOND	KY	24620.	9515.	83.	0.57	0.23
ASO	CEY	MURRAY-CALLOWAY COUNTY	MURRAY	KY	20550.	12632.	0.	0.85	0.22
ASO	9I0	WAYNE COUNTY	MONTICELLO	KY	20238.	9528.	0.	0.20	0.20
ASO	I05	STURGIS MUNI	STURGIS	KY	22083.	7209.	0.	0.22	0.19
ASO	I32	MOREHEAD-ROWAN COUNTY	MOREHEAD	KY	20887.	6817.	0.	0.20	0.18

ASO	1M7	FULTON	FULTON	KY	18264.	5961.	0.	0.17	0.16
ASO	I50	STANTON	STANTON	KY	16996.	6178.	0.	0.16	0.15
ASO	I30	BEREA-RICHMOND	BEREA	KY	14708.	6491.	0.	0.15	0.14
ASO	2M0	PRINCETON-CALDWELL COUNTY	PRINCETON	KY	13008.	4245.	0.	0.12	0.11
ASO	I33	MARSHALL FLD	GEORGETOWN	KY	5550.	9431.	0.	0.03	0.10
ASO	I49	ARNOLDS	SPRINGFIELD	KY	9426.	3077.	0.	0.09	0.08
ASO	I93	BRECKINRIDGE COUNTY	HARDINSBURG	KY	8111.	2647.	0.	0.08	0.07
ASO	51I	BOSS	BURNSIDE	KY	6507.	2124.	0.	0.06	0.06
ASO	KY07	BLUE LICK	LOUISVILLE	KY	2149.	702.	0.	0.02	0.02
ASO	MBO	BRUCE CAMPBELL FIELD	MADISON	MS	802016.	213337.	645.	5.04	6.75
ASO	HBG	HATTIESBURG MUNI	HATTIESBURG	MS	707197.	126511.	529.	4.87	5.54
ASO	TUP	C.D.LEMONS MUNI	TUPELO	MS	586576.	206777.	509.	4.08	5.27
ASO	OLV	OLIVE BRANCH	OLIVE BRANCH	MS	588775.	157627.	502.	3.58	4.96
ASO	PGL	JACKSON COUNTY	PASCAGOULA	MS	605588.	108536.	514.	3.57	4.74
ASO	HEZ	HARDY-ANDERS FIELD NATCHEZ-ADAMS COUNTY	NATCHEZ	MS	407921.	174117.	367.	2.29	3.87
ASO	PIB	PINE BELT REGIONAL	LAUREL/HATTIESBURG	MS	364959.	164447.	345.	2.11	3.52
ASO	LUL	HESLER-NOBLE FIELD	LAUREL	MS	408045.	68989.	365.	1.91	3.17
ASO	GWO	GREENWOOD-LEFLORE	GREENWOOD	MS	335159.	119789.	303.	2.31	3.02
ASO	VKS	VICKSBURG MUNI	VICKSBURG	MS	356211.	61632.	316.	2.10*	2.78*
ASO	RNV	CLEVELAND MUNI	CLEVELAND	MS	276033.	48286.	241.	2.10	2.15
ASO	MCB	MCCOMB-PIKE COUNTY	MC COMB	MS	274228.	47838.	254.	1.44	2.14
ASO	CKM	FLETCHER FIELD	CLARKSDALE	MS	238096.	42545.	203.	2.01	1.86
ASO	1R7	BROOKHAVEN-LINCOLN COUNTY	BROOKHAVEN	MS	155283.	26563.	139.	1.05*	1.21*
ASO	UOX	UNIVERSITY-OXFORD	OXFORD	MS	57019.	109298.	0.	2.12	1.11
ASO	GTR	GOLDEN TRIANGLE REGIONAL	COLUMBUS/W POINT/STARK	MS	45432.	120192.	0.	0.92	1.10
ASO	CRX	ROSCOE TURNER	CORINTH	MS	127576.	24294.	100.	1.31	1.01
ASO	IDL	INDIANOLA MUNICIPAL	INDIANOLA	MS	125098.	23219.	101.	0.76	0.99
ASO	5R2	GULFPARK	OCEAN SPRINGS	MS	89836.	23446.	285.	1.78	0.75
ASO	M16	JOHN BELL WILLIAMS	RAYMOND	MS	70318.	22953.	0.	0.65	0.62
ASO	M37	RULEVILLE-DREW	DREW	MS	74263.	13729.	60.	0.41*	0.58*
ASO	LMS	LOUISVILLE WINSTON COUNTY	LOUISVILLE	MS	68326.	12681.	56.	0.68	0.54
ASO	3R6	STENNIS INTERNATIONAL	BAY ST LOUIS	MS	57734.	18842.	0.	2.40	0.51
ASO	PCU	PICAYUNE PEARL RIVER COUNTY	PICAYUNE	MS	64506.	11407.	56.	0.36*	0.50*
ASO	2M7	DESOTO AIRPARK	HORN LAKE	MS	24127.	49507.	0.	0.34	0.49
ASO	2M6	TWINKLE TOWN	WALLS	MS	61732.	10770.	0.	0.10	0.48
ASO	0R0	COLUMBIA-MARION COUNTY	COLUMBIA	MS	52021.	16980.	0.	1.56	0.46
ASO	UBS	COLUMBUS-LOWNDES COUNTY	COLUMBUS	MS	51599.	16839.	0.	0.47	0.45
ASO	OSX	KOSCIUSKO-ATTALA COUNTY	KOSCIUSKO	MS	49709.	9226.	40.	0.49	0.39
ASO	STF	GEORGE M BRYAN	STARKVILLE	MS	43216.	14107.	0.	0.40	0.38
ASO	M40	MONROE COUNTY	ABERDEEN/AMORY	MS	36667.	11966.	0.	0.34	0.32
ASO	M41	HOLLY SPRINGS-MARSHALL COUNTY	HOLLY SPRINGS	MS	40779.	7648.	33.	0.28	0.32
ASO	M42	GRENADA MUNI	GRENADA	MS	34681.	11320.	0.	0.32	0.31
ASO	22M	PONTOTOC COUNTY	PONTOTOC	MS	30174.	9850.	0.	0.28	0.27
ASO	20M	MACON MUNI	MACON	MS	30039.	9805.	0.	0.28	0.26
ASO	25M	RIPLEY	RIPLEY	MS	33811.	5840.	30.	0.20*	0.26*
ASO	M23	OKEEFE FIELD	NEWTON	MS	28837.	9411.	0.	0.26	0.25
ASO	1M2	BELZONI MUNI	BELZONI	MS	25415.	7200.	53.	0.42	0.22
ASO	14M	HOLLANDALE MUNI	HOLLANDALE	MS	24407.	7967.	0.	0.23	0.22
ASO	MS06	DEAN GRIFFIN MEMORIAL	WIGGINS	MS	23952.	7817.	0.	0.22	0.21
ASO	M72	NEW ALBANY-UNION CO	NEW ALBANY	MS	19796.	6460.	0.	0.18	0.17
ASO	M68	DORR FIELD	MERIGOLD	MS	14873.	4854.	0.	0.14	0.13
ASO	8M1	BOONEVILLE-BALDWYN	BOONEVILLE-BALDWYN	MS	13638.	4451.	0.	0.12	0.12
ASO	0M6	PANOLA COUNTY	BATESVILLE	MS	12082.	3944.	0.	0.11	0.11
ASO	M83	MCCHAREN FIELD	WEST POINT	MS	10991.	3588.	0.	0.10	0.10
ASO	M44	HOUSTON MUNI	HOUSTON	MS	11369.	3710.	0.	0.10	0.10
ASO	M17	PHILADELPHIA MUNI	PHILADELPHIA	MS	10991.	3588.	0.	0.10	0.10
ASO	3A8	STINSON FIELD MUNI	ABERDEEN	MS	11306.	3690.	0.	0.10	0.10
ASO	08M	CARTHAGE-LEAKE COUNTY	CARTHAGE	MS	8970.	2927.	0.	0.08	0.08
ASO	5A6	WINONA-MONTGOMERY COUNTY	WINONA	MS	9092.	2967.	0.	0.08	0.08

ASO	07M	HASTING AIRPARK	BRUCE	MS	9488.	3097.	0.	0.09	0.08
ASO	M51	OKTIBBEHA	STARKVILLE	MS	9520.	3107.	0.	0.09	0.08
ASO	MS04	PRENTISS-JEFFERSON DAVIS COUNTY	PRENTISS	MS	8056.	2630.	0.	0.07	0.07
ASO	01M	TISHOMINGO COUNTY	BELMONT	MS	6444.	2103.	0.	0.06	0.06
ASO	2M4	FOREST MUNI	FOREST	MS	4544.	1483.	0.	0.04	0.04
ASO	T36	TYLERTOWN	TYLERTOWN	MS	2293.	748.	0.	0.02	0.02
ASO	4R1	I H BASS JR MEMORIAL	LUMBERTON	MS	1516.	495.	0.	0.01	0.01
ASO	LBT	LUMBERTON MUNI	LUMBERTON	NC	651670.	108557.	630.	3.74	5.05
ASO	MEB	LAURINBURG-MAXTON	MAXTON	NC	498365.	190100.	489.	3.42	4.57
ASO	W03	WILSON MUNI	WILSON	NC	519176.	101491.	477.	3.29*	4.12*
ASO	OCW	WARREN FIELD	WASHINGTON	NC	466840.	105985.	419.	2.78*	3.81*
ASO	EQY	MONROE	MONROE	NC	376893.	162498.	340.	2.83	3.58
ASO	RWI	ROCKY MOUNT-WILSON	ROCKY MOUNT	NC	346352.	161248.	340.	2.12	3.37
ASO	BUY	BURLINGTON MUNI	BURLINGTON	NC	335908.	94152.	271.	2.22	2.86
ASO	ECG	ELIZABETH CITY MUNI	ELIZABETH CITY	NC	357893.	58667.	349.	1.61*	2.77*
ASO	0A6	GASTONIA MUNI	GASTONIA	NC	284039.	129322.	202.	1.94*	2.75*
ASO	MRH	BEAUFORT-MOREHEAD CITY	BEAUFORT	NC	343139.	59979.	0.	0.61	2.68
ASO	MRN	MORGANTON-LENOIR	MORGANTON	NC	231282.	144233.	201.	1.65	2.50
ASO	RZZ	HALIFAX COUNTY	ROANOKE RAPIDS	NC	201746.	142868.	203.	2.19	2.29
ASO	45J	ROCKINGHAM-HAMLET	ROCKINGHAM	NC	268658.	64406.	243.	1.61	2.21
ASO	EDE	EDENTON MUNI	EDENTON	NC	238111.	70835.	220.	1.60	2.05
ASO	W77	SANFORD-LEE COUNTY BRICK FIELD	SANFORD	NC	252071.	45017.	229.	1.39	1.97
ASO	ASJ	TRI-COUNTY	AHOSKIE	NC	190695.	80479.	176.	1.42*	1.80*
ASO	SOP	PINEHURST-SOUTHERN PINES	SOUTHERN PINES	NC	124787.	142921.	2.	5.37	1.78
ASO	W44	ASHEBORO MUNI	ASHEBORO	NC	203020.	35924.	181.	1.16*	1.59*
ASO	CTZ	SAMPSON COUNTY	CLINTON	NC	111813.	106067.	82.	1.07	1.45
ASO	PGV	PITT-GREENVILLE	GREENVILLE	NC	73772.	129419.	1.	3.44	1.35
ASO	W52	HORACE WILLIAMS	CHAPEL HILL	NC	142918.	32113.	124.	0.82*	1.16*
ASO	0AJ	ALBERT J ELLIS	JACKSONVILLE	NC	43252.	119480.	0.	0.94	1.08
ASO	RUQ	ROWAN COUNTY	SALISBURY	NC	111282.	48423.	289.	1.97	1.06
ASO	GWW	GOLDSBORO-WAYNE MUNI	GOLDSBORO	NC	63635.	80847.	0.	2.03	0.96
ASO	8W5	BILLY MITCHELL	HATTERAS	NC	96620.	22221.	88.	0.79*	0.79*
ASO	CPC	COLUMBUS COUNTY MUNICIPAL	WHITEVILLE	NC	41446.	73603.	0.	0.58	0.76
ASO	3A3	ANSON COUNTY	WADESBORO	NC	21055.	90176.	0.	0.47	0.74
ASO	SVH	STATESVILLE MUNI	STATESVILLE	NC	60583.	37824.	0.	1.82	0.65
ASO	1A5	MACON COUNTY	FRANKLIN	NC	23328.	67691.	0.	0.41	0.60
ASO	6A3	ANDREWS-MURPHY	ANDREWS	NC	44087.	44511.	0.	0.51	0.59
ASO	IKB	WILKES COUNTY	WILKESBORO	NC	35179.	41604.	0.	0.97	0.51
ASO	MQI	MANTEO	MANTEO	NC	49815.	25296.	1.	1.05	0.50
ASO	57A	RUTHERFORD COUNTY	RUTHERFORDTON	NC	53993.	17620.	0.	2.36	0.48
ASO	4W8	HENDERSON-OXFORD	OXFORD	NC	53101.	17332.	0.	1.74	0.47
ASO	W46	ERWIN	ERWIN	NC	58591.	12141.	41.	0.35*	0.47*
ASO	MWK	MT AIRY-SURRY COUNTY	MT AIRY	NC	37557.	27745.	0.	0.40	0.43
ASO	24A	JACKSON COUNTY	SYLVA	NC	18331.	44698.	0.	0.29	0.42
ASO	W27	JOHNSTON COUNTY	SMITHFIELD	NC	45217.	14761.	0.	1.02	0.40
ASO	0A7	HENDERSONVILLE-WINKLER	HENDERSONVILLE	NC	40795.	19405.	0.	0.41	0.40
ASO	MCZ	MARTIN COUNTY	WILLIAMSTON	NC	20553.	36828.	0.	0.29	0.38
ASO	4A8	ALBEMARLE	ALBEMARLE	NC	16051.	37500.	0.	0.25	0.36
ASO	PMZ	PLYMOUTH MUNICIPAL	PLYMOUTH	NC	35807.	11689.	0.	0.77	0.32
ASO	SUT	BRUNSWICK COUNTY	SOUTHPORT	NC	39070.	6717.	36.	0.31*	0.30*
ASO	ACZ	HENDERSON FIELD	WALLACE	NC	25059.	20214.	0.	0.28	0.30
ASO	ZEF	ELKIN MUNI	ELKIN	NC	28313.	9241.	0.	0.89	0.25
ASO	DPL	P. B. RAIFORD	KENANSVILLE	NC	28790.	9397.	0.	1.07	0.25
ASO	W40	MT OLIVE MUNI	MT OLIVE	NC	21737.	13187.	0.	0.35	0.23
ASO	W95	OCRACOKE ISLAND	OCRACOKE	NC	25026.	8167.	0.	0.24	0.22
ASO	LFN	FRANKLIN COUNTY	LOUISBURG	NC	24539.	8011.	0.	0.23	0.22
ASO	43A	MONTGOMERY COUNTY	STAR	NC	19735.	6441.	0.	0.19	0.17
ASO	5W4	RAEFORD MUNI	RAEFORD	NC	15473.	5051.	0.	0.25	0.14
ASO	EXX	LEXINGTON MUNI	LEXINGTON	NC	12004.	3283.	31.	0.20	0.10

ASO	FFA	FIRST FLIGHT	KILL DEVIL HILLS	NC	6894.	8340.	0.	0.08	0.10
ASO	NC16	HIATT	THOMASVILLE	NC	11398.	3721.	0.	0.11	0.10
ASO	5W8	SILER CITY MUNI	SILER CITY	NC	8639.	2820.	0.	0.08	0.08
ASO	6A6	STANLY COUNTY	ALBEMARLE	NC	7437.	2427.	0.	0.07	0.07
ASO	7A8	AVERY COUNTY/MORRISON FIELD/	SPRUCE PINE	NC	6715.	2191.	0.	0.06	0.06
ASO	NC67	ASHE COUNTY	WEST JEFFERSON	NC	5515.	1800.	0.	0.05	0.05
ASO	BQN	BORINQUEN	AGUADILLA	PR	113053.	142269.	0.	1.68	1.70
ASO	X63	HUMACAO	HUMACAO	PR	17968.	111227.	0.	0.69	0.86
ASO	VQS	VIEQUES	ISLA DE VIEQUES	PR	7731.	107887.	0.	0.58	0.77
ASO	CPX	CULEBRA /RESTRICTED/	ISLA DE CULEBRA	PR	7002.	105232.	0.	0.52	0.75
ASO	ABO	ARECIBO AIRFIELD	ARECIBO	PR	18954.	6185.	0.	0.19	0.17
ASO	49J	HILTON HEAD	HILTON HEAD ISLAND	SC	942575.	264348.	823.	7.25*	8.02*
ASO	GRD	GREENWOOD COUNTY	GREENWOOD	SC	362261.	160295.	312.	2.84	3.47
ASO	CEU	CLEMSON-OCONEE COUNTY	CLEMSON	SC	373202.	137950.	326.	2.31*	3.40*
ASO	CUB	OWENS FIELD	COLUMBIA	SC	297272.	169969.	0.	2.95	3.10
ASO	CDN	WOODWARD FIELD	CAMDEN	SC	321520.	88852.	278.	2.35	2.73
ASO	BNL	BARNWELL COUNTY	BARNWELL	SC	209680.	101070.	175.	1.31*	2.06*
ASO	88J	ALLENDALE COUNTY	ALLENDALE	SC	217536.	81515.	161.	1.33*	1.99*
ASO	AND	ANDERSON COUNTY	ANDERSON	SC	102673.	117682.	0.	1.21	1.46
ASO	61J	J.E. LOCKLAIR MEMORIAL	SUMMERVILLE	SC	93832.	114798.	0.	1.13	1.39
ASO	JZI	JOHNS ISLAND	CHARLESTON	SC	74605.	120703.	0.	2.68	1.30
ASO	29J	BRYANT FIELD	ROCK HILL	SC	104275.	85511.	0.	2.57	1.26
ASO	SMS	SUMTER MUNI	SUMTER	SC	91919.	93226.	0.	1.02	1.23
ASO	RBW	WALTERBORO MUNI	WALTERBORO	SC	144779.	32449.	122.	1.04	1.18
ASO	MAO	MARION COUNTY	MARION	SC	143868.	29686.	126.	0.92	1.15
ASO	27J	NEWBERRY MUNI	NEWBERRY	SC	136679.	24061.	118.	0.77*	1.07*
ASO	50J	BERKELEY COUNTY	MONCKS CORNER	SC	33039.	116147.	0.	0.81	0.99
ASO	04J	DARLINGTON COUNTY	DARLINGTON	SC	113418.	33681.	110.	0.64*	0.98*
ASO	9A6	CHESTER MUNI	CHESTER	SC	115086.	27925.	70.	0.75	0.95
ASO	HVS	HARTSVILLE MUNI	HARTSVILLE	SC	94943.	19023.	69.	0.77	0.76
ASO	47J	CHERAW MUNI	CHERAW	SC	76594.	32241.	51.	0.52	0.72
ASO	FDW	FAIRFIELD COUNTY	WINNSBORO	SC	58600.	37527.	48.	0.44*	0.64*
ASO	AIK	AIKEN MUNI	AIKEN	SC	34765.	56477.	0.	0.45	0.61
ASO	LQK	PICKENS COUNTY	PICKENS	SC	64410.	24277.	0.	1.70	0.59
ASO	HYW	CONWAY-HORRY COUNTY	CONWAY	SC	52364.	36441.	0.	1.26	0.59
ASO	GGE	GEORGETOWN COUNTY	GEORGETOWN	SC	19137.	63837.	0.	0.33	0.55
ASO	OGB	ORANGEBURG	ORANGEBURG	SC	49186.	18345.	0.	1.24	0.45
ASO	58J	HUGGINS	TIMMONSVILLE	SC	42788.	8229.	33.	0.24*	0.34*
ASO	35A	UNION COUNTY	UNION	SC	12168.	36153.	0.	0.20	0.32
ASO	CKI	WILLIAMSBURG COUNTY	KINGSTREE	SC	35488.	11583.	0.	1.08	0.31
ASO	DLC	DILLON COUNTY	DILLON	SC	30798.	10052.	0.	0.28	0.27
ASO	73J	BEAUFORT COUNTY	BEAUFORT	SC	9183.	30089.	0.	0.16	0.26
ASO	34A	LAURENS COUNTY	LAURENS	SC	20883.	13276.	0.	0.21	0.23
ASO	LKR	LANCASTER COUNTY	LANCASTER	SC	19702.	6432.	0.	0.43	0.17
ASO	BBP	MARLBORO COUNTY	BENNETTSVILLE	SC	12836.	6994.	0.	0.12	0.13
ASO	5J9	TWIN CITY	LORIS	SC	12375.	4040.	0.	0.24	0.11
ASO	3J1	RIDGELAND MUNI	RIDGELAND	SC	11353.	3706.	0.	0.11	0.10
ASO	35J	PAGELAND	PAGELAND	SC	4752.	1551.	0.	0.04	0.04
ASO	52J	BISHOPVILLE MUNI	BISHOPVILLE	SC	1641.	824.	0.	0.02	0.02
ASO	CSV	CROSSVILLE MEMORIAL	CROSSVILLE	TN	1270273.	226335.	1230.	7.66	9.94
ASO	MKL	MCKELLAR FIELD	JACKSON	TN	534892.	195652.	499.	3.58	4.85
ASO	SYI	BOMAR FLD-SHELBYVILLE MUNI	SHELBYVILLE	TN	506581.	104907.	468.	3.38	4.06
ASO	THA	WILLIAM NORTHERN FIELD	TULLAHOMA	TN	584592.	71800.	320.	2.64	3.03
ASO	MOR	MOORE-MURRELL	MORRISTOWN	TN	277516.	73473.	173.	6.35	2.33
ASO	CKV	OUTLAW FIELD	CLARKSVILLE	TN	109558.	141123.	0.	1.55	1.67
ASO	SRB	SPARTA-WHITE COUNTY	SPARTA	TN	126698.	83059.	106.	1.08	1.39
ASO	PHT	HENRY COUNTY	PARIS	TN	69480.	127998.	2.	3.38	1.31

ASO	2M8	CHARLES W. BAKER	MILLINGTON	TN	119803.	68883.	0.	1.23	1.25
ASO	GCY	GREENEVILLE MUNI	GREENEVILLE	TN	74466.	107117.	1.	3.17	1.21
ASO	UCY	EVERETT-STEWART	UNION CITY	TN	72060.	106703.	0.	2.23	1.19
ASO	TGC	GIBSON COUNTY	TRENTON	TN	134205.	24250.	117.	1.03	1.05
ASO	3A9	SEVIER-GATLINBURG	SEVIERVILLE	TN	61679.	90475.	0.	2.77	1.01
ASO	GHM	CENTERVILLE MUNI	CENTERVILLE	TN	55839.	93356.	43.	0.64	0.99
ASO	M52	FRANKLIN WILKINS	LEXINGTON	TN	121474.	21358.	109.	0.84	0.95
ASO	0A9	ELIZABETHTON MUNI	ELIZABETHTON	TN	78766.	55495.	0.	0.85	0.89
ASO	MBT	MURFREESBORO MUNI	MURFREESBORO	TN	98429.	32134.	0.	1.56	0.87
ASO	DYR	DYERSBURG MUNI	DYERSBURG	TN	53193.	76289.	0.	1.92	0.86
ASO	M01	GENERAL DEWITT SPAIN	MEMPHIS	TN	89115.	29757.	0.	0.85	0.79
ASO	M88	CORNELIA FORT AIRPARK	NASHVILLE	TN	89137.	29099.	0.	0.86	0.79
ASO	HDI	HARDWICK FIELD	CLEVELAND	TN	68531.	49483.	0.	1.97	0.78
ASO	M54	LEBANON MUNI	LEBANON	TN	39085.	75164.	0.	1.58	0.76
ASO	0M4	BENTON COUNTY	CAMDEN	TN	23098.	90720.	0.	1.11	0.76
ASO	CJE	PUTNAM COUNTY	COOKEVILLE	TN	48984.	63579.	0.	1.26	0.75
ASO	SNH	SAVANNAH-HARDIN COUNTY	SAVANNAH	TN	34949.	70913.	0.	1.38	0.70
ASO	0M5	HUMPHREYS COUNTY	WAVERLY	TN	24872.	78464.	0.	0.87	0.69
ASO	MRC	MAURY COUNTY	COLUMBIA/MT PLEASANT	TN	45382.	50562.	0.	1.54	0.64
ASO	1M5	PORTLAND MUNICIPAL	PORTLAND	TN	36424.	59477.	0.	1.32	0.64
ASO	M33	GALLATIN MUNI	GALLATIN	TN	34631.	58893.	0.	0.98	0.62
ASO	SZY	ROBERT SIBLEY	SELMER	TN	25826.	67935.	0.	1.16	0.62
ASO	MMI	MCMINN COUNTY	ATHENS	TN	51106.	40417.	0.	2.01	0.61
ASO	RNC	WARREN COUNTY MEMORIAL	MCMINNVILLE	TN	36252.	54677.	0.	1.23	0.60
ASO	2A0	MARK ANTON	DAYTON	TN	33762.	52676.	0.	1.31	0.57
ASO	M08	BOLIVAR-HARDEMAN COUNTY	BOLIVAR	TN	55782.	24128.	0.	0.55	0.53
ASO	LHC	ARLINGTON MUNI	ARLINGTON	TN	53347.	23338.	0.	1.08	0.51
ASO	M04	COVINGTON MUNI	COVINGTON	TN	56807.	18543.	0.	1.53	0.50
ASO	BGF	WINCHESTER MUNI	WINCHESTER	TN	31514.	40068.	0.	0.39	0.48
ASO	FYM	FAYETTEVILLE MUNI	FAYETTEVILLE	TN	36759.	29820.	0.	1.39	0.44
ASO	JAU	CAMPBELL COUNTY	JACKSBORO	TN	32988.	28590.	0.	0.98	0.41
ASO	M91	SPRINGFIELD MUNI	SPRINGFIELD	TN	38448.	22977.	0.	0.40	0.41
ASO	RKW	ROCKWOOD MUNI	ROCKWOOD	TN	30272.	27702.	0.	1.27	0.39
ASO	M53	HUMBOLDT MUNI	HUMBOLDT	TN	35925.	17586.	3.	1.35	0.36
ASO	APT	MARION COUNTY-BROWN FLD	JASPER	TN	18962.	33007.	0.	0.64	0.35
ASO	LUG	ELLINGTON	LEWISBURG	TN	29464.	21456.	0.	0.96	0.34
ASO	RVN	HAWKINS COUNTY	ROGERSVILLE	TN	25046.	23012.	0.	0.78	0.32
ASO	MNV	MONROE COUNTY	MADISONVILLE	TN	29181.	9524.	0.	0.28	0.26
ASO	0M1	SCOTT FIELD	PARSONS	TN	28776.	9391.	0.	0.27	0.25
ASO	M29	HASSELL FIELD	CLIFTON	TN	27556.	5025.	24.	0.16*	0.22*
ASO	8A3	LIVINGSTON MUNI	LIVINGSTON	TN	23396.	7636.	0.	0.22	0.21
ASO	M02	DICKSON MUNI	DICKSON	TN	20734.	8548.	0.	0.58	0.19
ASO	3A2	TAZEWELL'S-CLAIBORNE COUNTY	TAZEWELL	TN	19788.	6458.	0.	0.19	0.17
ASO	GZS	ABERNATHY FIELD	PULASKI	TN	19834.	6473.	0.	0.19	0.17
ASO	2M2	LAWRENCEBURG MUNI	LAWRENCEBURG	TN	18669.	7613.	0.	0.18	0.17
ASO	2A1	JAMESTOWN MUNI	JAMESTOWN	TN	17944.	5857.	0.	0.17	0.16
ASO	1A3	MARTIN CAMPBELL FIELD	COPPERHILL	TN	12911.	10788.	0.	0.14	0.16
ASO	3M7	LAFAYETTE MUNICIPAL	LAFAYETTE	TN	16770.	5474.	0.	0.16	0.15
ASO	UOS	FRANKLIN COUNTY	SEWANEE	TN	7505.	14289.	0.	0.11	0.14
ASO	6A4	JOHNSON COUNTY	MOUNTAIN CITY	TN	13524.	5250.	0.	0.13	0.12
ASO	0M2	REELFOOT LAKE	TIPTONVILLE	TN	8914.	3194.	0.	0.08	0.08
ASO	1A7	JACKSON COUNTY	GAINESBORO	TN	1958.	639.	0.	0.02	0.02
ASO	SCX	SCOTT MUNI	ONEIDA	TN	162.	49.	0.	0.00	0.00

SOUTHWEST REGION

ASW	JBR	JONESBORO MUNI	JONESBORO	AR	1656932.	386449.	1420.	10.81	13.58
ASW	1M1	NORTH LITTLE ROCK MUNI	NORTH LITTLE ROCK	AR	730429.	161124.	621.	4.57	5.92

ASW	ARG	WALNUT RIDGE REGIONAL	WALNUT RIDGE	AR	596366.	181540.	531.	4.02	5.17
ASW	H37	SPRINGDALE MUNI	SPRINGDALE	AR	535617.	216444.	363.	8.33	5.00
ASW	FLP	MARION COUNTY REGIONAL	FLIPPIN	AR	551246.	200482.	479.	3.50*	4.99*
ASW	M39	MENA MUNICIPAL	MENA	AR	439545.	179402.	384.	3.53*	4.11*
ASW	H00	BENTONVILLE MUN	BENTONVILLE	AR	334906.	163552.	288.	2.27*	3.31*
ASW	2M9	MOUNTAIN HOME MUNI	MOUNTAIN HOME	AR	317669.	159707.	277.	2.20*	3.17*
ASW	M07	SEARCY MUNI	SEARCY	AR	313710.	153082.	277.	2.25*	3.10*
ASW	HBZ	HEBER SPRINGS MUNI	HEBER SPRINGS	AR	358907.	62347.	313.	2.05*	2.80*
ASW	PGR	PARAGOULD MUNI	PARAGOULD	AR	238987.	128297.	186.	2.65	2.44
ASW	CDH	HARRELL FIELD	CAMDEN	AR	190788.	116789.	161.	1.75	2.04
ASW	SGT	STUTTGART MUNI	STUTTGART	AR	241684.	48061.	194.	1.42	1.93
ASW	M06	RUSSELLVILLE MUNI	RUSSELLVILLE	AR	187971.	98940.	165.	1.23*	1.91*
ASW	M76	MONTICELLO MUNICIPAL	MONTICELLO	AR	231777.	47951.	197.	1.29*	1.86*
ASW	M03	CONWAY MUNI	CONWAY	AR	209028.	41434.	185.	1.31*	1.66*
ASW	HKA	BLYTHEVILLE MUNI	BLYTHEVILLE	AR	99668.	121596.	0.	1.21	1.47
ASW	M18	HOPE MUNICIPAL	HOPE	AR	139599.	73848.	122.	1.08	1.42
ASW	SLG	SMITH FIELD	SILOAM SPRINGS	AR	108424.	99271.	90.	0.82*	1.38*
ASW	M32	LAKE VILLAGE MUNI	LAKE VILLAGE	AR	160274.	43105.	142.	1.01*	1.35*
ASW	BVX	BATESVILLE REGIONAL	BATESVILLE	AR	146317.	56433.	122.	1.22	1.35
ASW	ELD	GOODWIN FIELD	EL DORADO	AR	130400.	66698.	105.	0.78	1.31
ASW	M19	NEWPORT MUNI	NEWPORT	AR	120619.	56051.	101.	1.07	1.17
ASW	M89	ARKADELPHIA MUNI	ARKADELPHIA	AR	101613.	70771.	0.	1.04	1.15
ASW	7M1	MCGEHEE MUNI	MCGEHEE	AR	70596.	102839.	50.	0.72*	1.15*
ASW	M73	ALMYRA MUNI	ALMYRA	AR	123649.	46888.	106.	0.74*	1.13*
ASW	M99	SALINE COUNTY	BENTON	AR	120189.	46735.	102.	0.74*	1.11*
ASW	H35	CLARKSVILLE MUNI	CLARKSVILLE	AR	43733.	113633.	34.	0.74*	1.05*
ASW	4M3	CARLISLE MUNI	CARLISLE	AR	74226.	76791.	0.	0.82	1.00
ASW	HRO	BOONE COUNTY	HARRISON	AR	32125.	115848.	0.	1.79	0.98
ASW	M70	POCAHONTAS MUNI	POCAHONTAS	AR	102979.	43156.	89.	0.67	0.97
ASW	F90	SEVIER COUNTY	DEQUEEN	AR	105582.	37374.	91.	0.66	0.95
ASW	F43	DOWNTOWN	EL DORADO	AR	43318.	97362.	0.	0.66	0.93
ASW	CRT	CROSSETT MUNI	CROSSETT	AR	107699.	32161.	88.	0.68	0.93
ASW	HEE	THOMPSON-ROBBINS	HELENA/WEST HELENA	AR	50009.	88897.	0.	1.28	0.92
ASW	ROG	ROGERS MUNI ARPT-CARTER FLD	ROGERS	AR	48035.	87317.	2.	1.80	0.90
ASW	3M9	WARREN MUNICIPAL	WARREN	AR	68179.	16923.	59.	0.40*	0.57*
ASW	FCY	FORREST CITY MUNI	FORREST CITY	AR	58863.	23276.	0.	0.22	0.55
ASW	7M5	OZARK-FRANKLIN COUNTY	OZARK	AR	35425.	39679.	0.	1.08	0.50
ASW	4M1	CARROLL COUNTY	BERRYVILLE	AR	18869.	53138.	0.	0.30	0.48
ASW	AGO	MAGNOLIA MUNI	MAGNOLIA	AR	15399.	50093.	0.	0.57	0.44
ASW	M78	MALVERN MUNICIPAL	MALVERN	AR	35166.	17804.	0.	0.34	0.35
ASW	M36	FRANK FEDERER MEMORIAL	BRINKLEY	AR	28005.	24816.	0.	0.30	0.35
ASW	4M9	CORNING MUNI	CORNING	AR	25391.	25156.	0.	0.29	0.34
ASW	MXA	MANILA MUNI	MANILA	AR	22154.	21294.	0.	0.25	0.29
ASW	7M4	OSCEOLA MUNI	OSCEOLA	AR	25391.	14614.	0.	0.25	0.27
ASW	CVK	CHEROKEE VILLAGE	CHEROKEE VILLAGE	AR	21776.	17116.	14.	0.42	0.26
ASW	7M2	HARRY E WILCOX MEMORIAL FIELD	MOUNTAIN VIEW	AR	18370.	12323.	0.	0.19	0.20
ASW	6M8	MARKED TREE MUNI	MARKED TREE	AR	15932.	10823.	0.	0.16	0.18
ASW	4M4	CLINTON MUNI	CLINTON	AR	14537.	11627.	0.	0.15	0.17
ASW	M77	HOWARD COUNTY	NASHVILLE	AR	18668.	6093.	0.	0.17	0.16
ASW	M65	WYNNE MUNI	WYNNE	AR	12223.	10280.	0.	0.13	0.15
ASW	5M1	DE WITT MUNI	DE WITT	AR	16430.	5363.	0.	0.15	0.14
ASW	M27	WALDRON MUNI	WALDRON	AR	14537.	4745.	0.	0.13	0.13
ASW	MPJ	PETIT JEAN PARK	MORRILTON	AR	13383.	4368.	0.	0.54	0.12
ASW	5M4	FORDYCE MUNI	FORDYCE	AR	12073.	3941.	0.	0.11	0.11
ASW	6M7	LEE COUNTY-MARIANNA	MARIANNA	AR	12073.	3941.	0.	0.11	0.11
ASW	5M5	CRYSTAL LAKE	DECATUR	AR	7966.	2600.	0.	0.25	0.07
ASW	HUM	HOUMA-TERREBONNE	HOUMA	LA	1574430.	391109.	1360.	17.26	13.06
ASW	RSN	RUSTON MUNI	RUSTON	LA	685919.	187233.	635.	3.93	5.80
ASW	0R9	HAMMOND MUNI	HAMMOND	LA	444350.	79052.	425.	2.96*	3.48*

ASW	6R0	SLIDELL	SLIDELL	LA	376435.	65613.	354.	2.29*	2.94*
ASW	6R1	WELSH	WELSH	LA	254105.	43796.	242.	1.29	1.98
ASW	0R3	ABBEVILLE MUNI	ABBEVILLE	LA	241798.	53090.	224.	1.47*	1.96*
ASW	PTN	HARRY P WILLIAMS MEMORIAL	PATTERSON	LA	143464.	142739.	459.	4.35	1.90
ASW	OPL	ST LANDRY PARISH	OPELOUSAS	LA	228136.	39765.	214.	1.39*	1.78*
ASW	ARA	ACADIANA REGIONAL	NEW IBERIA	LA	130153.	108754.	339.	2.71	1.59
ASW	LA37	THIBODAUX MUNI	THIBODAUX	LA	176791.	30815.	166.	1.08*	1.38*
ASW	5R8	DE QUINCY INDUSTRIAL AIRPARK	DE QUINCY	LA	136880.	23858.	129.	0.83*	1.07*
ASW	DRI	BEAUREGARD PARISH	DE RIDDER	LA	136350.	23590.	138.	0.80	1.06
ASW	4R0	MCFILLEN AIR PARK	LAKE CHARLES	LA	132304.	23068.	123.	0.79*	1.03*
ASW	3R4	HART	MANY	LA	77196.	13198.	74.	0.61	0.60
ASW	3R8	NATCHITOCHES MUNI	NATCHITOCHES	LA	59323.	23428.	171.	1.64	0.55
ASW	3R2	LE GROS MEMORIAL	CROWLEY	LA	69039.	14395.	50.	0.43*	0.55*
ASW	3F4	VIVIAN	VIVIAN	LA	26477.	51881.	0.	0.40	0.52
ASW	LA23	LEEVILLE	LEEVILLE	LA	49474.	16153.	0.	0.49	0.44
ASW	LA96	OAKLAWN	FRANKLIN	LA	44892.	14652.	0.	0.50	0.40
ASW	M79	RAYVILLE MUNI	RAYVILLE	LA	46677.	11023.	26.	0.33*	0.38*
ASW	2F8	MOREHOUSE MEMORIAL	BASTROP	LA	40139.	13101.	0.	1.30	0.35
ASW	BXA	GEORGE R CARR MEMORIAL AIR FLD	BOGALUSA	LA	32983.	10766.	0.	0.32	0.29
ASW	LA08	RICHARD PRIVETTE SR	COVINGTON	LA	26134.	8530.	0.	0.26	0.23
ASW	3R7	JENNINGS	JENNINGS	LA	26015.	8492.	0.	0.68	0.23
ASW	0M8	BYERLEY	LAKE PROVIDENCE	LA	22308.	7283.	0.	0.22	0.20
ASW	0R4	CONCORDIA PARISH	VIDALIA	LA	22530.	7354.	0.	0.22	0.20
ASW	LA18	JONESVILLE	JONESVILLE	LA	22101.	7215.	0.	0.22	0.19
ASW	9LA6	PINEVILLE MUNICIPAL	PINEVILLE	LA	20059.	6547.	0.	0.19	0.18
ASW	4R5	EAST LAKE CHARLES	LAKE CHARLES	LA	18310.	5977.	0.	0.18	0.16
ASW	F87	FARMERVILLE	FARMERVILLE	LA	16380.	4243.	54.	0.35	0.14
ASW	9M6	KELLY	OAK GROVE	LA	15505.	5061.	0.	0.15	0.14
ASW	4R7	EUNICE	EUNICE	LA	15679.	5118.	0.	0.52	0.14
ASW	2R1	JEANERETTE	JEANERETTE	LA	15335.	5006.	0.	0.15	0.14
ASW	3F3	DESOTO PARISH	MANSFIELD	LA	14218.	4641.	0.	0.14	0.13
ASW	SPH	SPRINGHILL	SPRINGHILL	LA	14287.	4663.	0.	0.14	0.13
ASW	0R5	DAVID G JOYCE	WINNFIELD	LA	14634.	4777.	0.	0.14	0.13
ASW	0M9	DELHI MUNI	DELHI	LA	13856.	4523.	0.	0.13	0.12
ASW	F24	MINDEN-WEBSTER	MINDEN	LA	12081.	3943.	0.	0.12	0.11
ASW	F88	JONESBORO	JONESBORO	LA	11726.	3076.	37.	0.23	0.10
ASW	M80	SCOTT	TALLULAH	LA	10455.	3412.	0.	0.10	0.09
ASW	2R3	WESTWEGO ARPT INC	WESTWEGO	LA	10454.	3412.	0.	0.10	0.09
ASW	F89	WINNSBORO MUNI	WINNSBORO	LA	9294.	3034.	0.	0.09	0.08
ASW	2R7	FRANKLINTON	FRANKLINTON	LA	8446.	2757.	0.	0.08	0.07
ASW	1R1	JENA	JENA	LA	5317.	1735.	0.	0.05	0.05
ASW	ALM	ALAMOGORDO-WHITE SANDS REGIONAL	ALAMOGORDO	NM	608483.	198397.	574.	1.58*	5.36*
ASW	LRU	LAS CRUCES-CRAWFORD	LAS CRUCES	NM	582285.	198175.	560.	3.97*	5.19*
ASW	4AC	CORONADO	ALBUQUERQUE	NM	379985.	229390.	0.	4.33	4.05
ASW	Q64	ALAMEDA	ALBUQUERQUE	NM	217470.	92235.	0.	2.26	2.06
ASW	TCC	TUCUMCARI MUNI	TUCUMCARI	NM	233029.	47793.	205.	2.27	1.87
ASW	CNM	CAVERN CITY AIR TRML	CARLSBAD	NM	134964.	123317.	82.	1.50	1.72
ASW	GUP	SENATOR CLARKE FIELD	GALLUP	NM	109465.	133324.	48.	3.72	1.61
ASW	CVN	CLOVIS MUNI	CLOVIS	NM	100103.	130116.	2.	4.45	1.53
ASW	RUI	RUIDOSO MUNI	RUIDOSO	NM	78355.	130932.	0.	1.29	1.39
ASW	LAM	LOS ALAMOS	LOS ALAMOS	NM	37067.	117460.	0.	0.86	1.03
ASW	Q34	PORTALES MUNI	PORTALES	NM	131726.	23299.	124.	0.80*	1.03*
ASW	LVS	LAS VEGAS MUN	LAS VEGAS	NM	43637.	88141.	17.	1.55	0.88
ASW	SVC	SILVER CITY & GRANT CO	SILVER CITY	NM	16241.	109690.	1.	1.01	0.84
ASW	DMN	DEMING MUNI	DEMING	NM	64938.	32948.	27.	1.76	0.65
ASW	SKX	TAOS MUNI	TAOS	NM	45241.	33088.	142.	0.98	0.52
ASW	RTN	CREWS FLD	RATON	NM	41541.	8408.	33.	0.51	0.33
ASW	ONM	SOCORRO MUNI	SOCORRO	NM	27491.	14282.	0.	0.87	0.28
ASW	ATS	ARTESIA MUN	ARTESIA	NM	30704.	10006.	17.	0.60	0.27

ASW	E06	LEA COUNTY-LOVINGTON	LOVINGTON	NM	30925.	10093.	0.	0.31	0.27
ASW	GNT	GRANTS-MILAN MUNI	GRANTS	NM	20081.	17131.	0.	0.24	0.25
ASW	E98	MID VALLEY AIRPARK	LOS LUNAS	NM	7109.	18265.	0.	0.13	0.17
ASW	TCS	TRUTH OR CONSEQUENCES MUNI	TRUTH OR CONSEQUENCES	NM	14762.	4818.	0.	0.48	0.13
ASW	5V5	SHIPROCK AIRSTRIP	SHIPROCK	NM	14131.	4611.	0.	0.14	0.12
ASW	1E6	TURNER RIDGEPORT	SILVER CITY	NM	983.	17509.	0.	0.07	0.12
ASW	Q14	ESPANOLA MUNI	ESPANOLA	NM	14156.	4621.	0.	0.14	0.12
ASW	Q19	AZTEC MUNI	AZTEC	NM	12365.	4036.	0.	0.12	0.11
ASW	E26	LEA COUNTY/JAL/	JAL	NM	11709.	3822.	0.	0.12	0.10
ASW	0E0	MORIARTY	MORIARTY	NM	8782.	2367.	0.	0.09	0.08
ASW	E91	ANGEL FIRE	EAGLE NEST	NM	0.	10501.	0.	0.04	0.07
ASW	LSB	LORDSBURG MUNI	LORDSBURG	NM	7487.	2444.	0.	0.08	0.07
ASW	Q16	RESERVE	RESERVE	NM	1444.	3348.	0.	0.02	0.03
ASW	Q58	SANTA ROSA MUNICIPAL	SANTA ROSA	NM	3641.	1189.	0.	0.04	0.03
ASW	FSU	FORT SUMNER MUNI	FORT SUMNER	NM	2952.	964.	0.	0.03	0.03
ASW	Q37	CARRIZOZO MUNI	CARRIZOZO	NM	2166.	707.	0.	0.02	0.02
ASW	Q42	SPRINGER MUNI	SPRINGER	NM	632.	206.	0.	0.01	0.01
ASW	E89	CONCHAS STATE PARK	CONCHAS DAM	NM	820.	268.	0.	0.01	0.01
ASW	NM01	DULCE	DULCE	NM	820.	268.	0.	0.01	0.01
ASW	66E	FORT STANTON	RUIDOSO	NM	61.	20.	0.	0.00	0.00
ASW	SWO	STILLWATER MUNI	STILLWATER	OK	841270.	253133.	790.	6.07	7.27
ASW	DUC	HALLIBURTON FIELD	DUNCAN	OK	494585.	190931.	519.	3.45	4.55
ASW	GUY	GUYMON MUNI	GUYMON	OK	534405.	117037.	441.	5.58	4.33
ASW	OUN	MAX WESTHEIMER	NORMAN	OK	376704.	225811.	6.	13.71	4.00
ASW	SNL	SHAWNEE MUNI	SHAWNEE	OK	379336.	176775.	319.	4.41	3.69
ASW	ADH	ADA MUNI	ADA	OK	379163.	164155.	388.	2.91*	3.61*
ASW	F29	CLARENCE E PAGE MUNI	OKLAHOMA CITY	OK	456752.	85566.	434.	2.90*	3.60*
ASW	GOK	GUTHRIE MUNI	GUTHRIE	OK	436002.	100385.	341.	3.26	3.56
ASW	AXS	ALTUS MUNI	ALTUS	OK	346826.	131815.	326.	2.32*	3.18*
ASW	MKO	DAVIS FIELD	MUSKOGEE	OK	345286.	130090.	311.	3.60	3.16
ASW	BVO	FRANK PHILLIPS	BARTLESVILLE	OK	290883.	157492.	262.	3.07	2.98
ASW	OKM	OKMULGEE MUNI.	OKMULGEE	OK	313241.	75701.	209.	2.12*	2.58*
ASW	1H6	HARVEY YOUNG	TULSA	OK	263182.	85902.	0.	2.60	2.32
ASW	H45	SEMINOLE MUNI	SEMINOLE	OK	262920.	58739.	250.	1.68*	2.14*
ASW	FDR	FREDERICK MUNI	FREDERICK	OK	226642.	85017.	0.	2.59	2.07
ASW	CUH	CUSHING MUNI	CUSHING	OK	259255.	48799.	229.	3.14	2.05
ASW	PNC	PONCA CITY MUNI	PONCA CITY	OK	123908.	145637.	2.	6.28	1.79
ASW	3K1	ALVA MUNI	ALVA	OK	213132.	54207.	198.	1.42	1.78
ASW	ELK	ELK CITY MUNI	ELK CITY	OK	149440.	107277.	134.	1.45	1.71
ASW	F91	THOMAS P STAFFORD	WEATHERFORD	OK	154899.	60519.	143.	1.03*	1.43*
ASW	OK14	GOLDSBY	NORMAN	OK	81718.	131107.	0.	1.28	1.41
ASW	2EJ	EXPRESSWAY AIRPARK	OKLAHOMA CITY	OK	100391.	99048.	0.	1.21	1.33
ASW	CLK	CLINTON MUNI	CLINTON	OK	138547.	57662.	120.	1.17	1.30
ASW	F61	PAULS VALLEY MUNI	PAULS VALLEY	OK	153580.	35934.	960.	2.02	1.26
ASW	0F8	WILLIAM R. POGUE MUNI	SAND SPRINGS	OK	145366.	31675.	139.	0.94*	1.18*
ASW	2DT	DOWNTOWN AIRPARK	OKLAHOMA CITY	OK	78417.	91873.	0.	0.99	1.13
ASW	F62	IDABEL	IDABEL	OK	125853.	40470.	107.	1.41	1.11
ASW	CHK	CHICKASHA MUNI	CHICKASHA	OK	85240.	71991.	0.	1.00	1.04
ASW	1F0	DOWNTOWN ARDMORE	ARDMORE	OK	65869.	76692.	6.	2.82	0.95
ASW	MLC	MC ALESTER MUNI	MC ALESTER	OK	43621.	97629.	3.	2.33	0.94
ASW	1H7	GROVE MUNI	GROVE	OK	38756.	93189.	0.	0.65	0.88
ASW	G[illegible]	GAGE MUNI	GAGE	OK	99048.	22562.	96.	0.76*	0.81*
ASW	5F2	DOWNTOWN AIRPARK	TULSA	OK	88438.	31546.	0.	0.88	0.80
ASW	WWR	WEST WOODWARD	WOODWARD	OK	65795.	50177.	0.	2.34	0.77
ASW	F28	MUSTANG FIELD	EL RENO	OK	79441.	25928.	0.	0.78	0.70
ASW	F10	HENRYETTA MUNI	HENRYETTA	OK	83031.	16167.	68.	1.15	0.66
ASW	RKR	ROBERT S KERR	POTEAU	OK	44034.	51157.	92.	1.44	0.63
ASW	H71	PRYOR	PRYOR CREEK	OK	49716.	43774.	0.	2.05	0.62
ASW	HBR	HOBART MUNI	HOBART	OK	75255.	18372.	73.	0.52	0.62

ASW	DUA	EAKER FIELD	DURANT	OK	45846.	48114.	0.	1.21	0.62
ASW	F31	LAKE TEXOMA STATE PARK	KINGSTON	OK	13845.	76025.	0.	0.37	0.60
ASW	MIO	MIAMI MUNI	MIAMI	OK	54301.	19008.	44.	0.63	0.49
ASW	HAX	HATBOX FIELD	MUSKOGEE	OK	40991.	31028.	0.	0.46	0.48
ASW	H73	TAHLEQUAH MUNI	TAHLEQUAH	OK	40896.	24964.	0.	0.44	0.44
ASW	6K4	FAIRVIEW MUNI	FAIRVIEW	OK	42604.	22240.	0.	0.45	0.43
ASW	F36	CORDELL MUNI	CORDELL	OK	34723.	22830.	111.	0.76	0.38
ASW	H05	WILBURTON MUNI	WILBURTON	OK	19805.	34012.	0.	0.29	0.36
ASW	2F6	SKIATOOK MUNI	SKIATOOK	OK	27568.	23062.	0.	0.32	0.34
ASW	F22	PERRY MUNI	PERRY	OK	33486.	17550.	0.	0.35	0.34
ASW	OK56	BLACKWELL-TONKAWA MUNI	BLACKWELL	OK	38655.	9888.	132.	0.97	0.32
ASW	OK08	HILL TOP PVT	LAWTON	OK	34589.	11291.	0.	0.34	0.30
ASW	17K	BOISE CITY	BOISE CITY	OK	28214.	14775.	0.	0.30	0.29
ASW	OK68	MEDFORD MUNI	MEDFORD	OK	20914.	23453.	0.	0.26	0.29
ASW	6F3	EAGLES NEST	SAND SPRINGS	OK	31627.	10323.	0.	0.31	0.28
ASW	H68	WAGONER AIRSTRIP	WAGONER	OK	30258.	10485.	0.	0.30	0.27
ASW	SUD	STROUD MUNI	STROUD	OK	16563.	22033.	0.	0.22	0.26
ASW	2M3	SALLISAW MUNI	SALLISAW	OK	22664.	12962.	0.	0.24	0.24
ASW	7F4	SEQUOYAH PARK	WAGONER	OK	21771.	12672.	0.	0.23	0.23
ASW	OK78	WATONGA	WATONGA	OK	20942.	12514.	0.	0.23	0.22
ASW	95F	CLEVELAND MUNI	CLEVELAND	OK	23477.	7662.	0.	0.23	0.21
ASW	F99	HOLDENVILLE MUNI	HOLDENVILLE	OK	10796.	20638.	0.	0.16	0.21
ASW	H76	PAWHUSKA MUNI	PAWHUSKA	OK	23762.	7755.	0.	0.23	0.21
ASW	3F7	JONES MEML	BRISTOW	OK	21852.	10095.	0.	0.22	0.21
ASW	93F	MIGNON LAIRD MUNI	CHEYENNE	OK	16829.	13827.	0.	0.19	0.20
ASW	K92	HI-WAY	BARTLESVILLE	OK	13959.	16361.	0.	0.17	0.20
ASW	F30	SULPHUR MUNI	SULPHUR	OK	12775.	12504.	0.	0.15	0.17
ASW	92F	CHATTANOOGA SKY HARBOR	CHATTANOOGA	OK	14434.	10614.	0.	0.16	0.17
ASW	1F4	MADILL MUNICIPAL	MADILL	OK	11587.	12116.	0.	0.14	0.16
ASW	OK70	MOORELAND MUNI	MOORELAND	OK	12939.	9790.	0.	0.15	0.15
ASW	OK73	SEILING	SEILING	OK	15028.	7688.	0.	0.16	0.15
ASW	OK60	CHEROKEE MUNI	CHEROKEE	OK	11245.	9729.	0.	0.13	0.14
ASW	0F7	FOUNTAINHEAD LODGE AIRPARK	EUFAULA	OK	11619.	9357.	0.	0.13	0.14
ASW	OK26	TIPTON MUNI	TIPTON	OK	15330.	5004.	0.	0.15	0.14
ASW	H04	VINITA MUNI	VINITA	OK	13479.	5581.	0.	0.14	0.13
ASW	H66	NOWATA MUNI	NOWATA	OK	10376.	8952.	0.	0.12	0.13
ASW	H01	CHANDLER MUNI	CHANDLER	OK	14388.	4696.	0.	0.14	0.13
ASW	Q44	BEAVER MUNI	BEAVER	OK	8257.	9316.	0.	0.10	0.12
ASW	F53	NASH MUNI	HUGO	OK	11278.	4863.	0.	0.12	0.11
ASW	1F1	LAKE MURRAY STATE PARK	OVERBROOK	OK	12158.	3968.	0.	0.12	0.11
ASW	86F	CARNEGIE MUNI	CARNEGIE	OK	10066.	3285.	0.	0.10	0.09
ASW	91F	ARROWHEAD	CANADIAN	OK	9643.	3147.	0.	0.09	0.08
ASW	F32	HEALDTON MUNI	HEALDTON	OK	4821.	7139.	0.	0.07	0.08
ASW	87F	81ST STREET AIRPARK	BROKEN ARROW	OK	8706.	2841.	0.	0.08	0.08
ASW	F38	CANEY CREEK	KINGSTON	OK	5579.	1821.	0.	0.05	0.05
ASW	K49	MUNICIPAL	TEXHOMA	OK	6170.	2014.	0.	0.06	0.05
ASW	4F1	KEYSTONE AIR PARK	CLEVELAND	OK	242.	79.	0.	0.00	0.00
ASW	SGR	HULL FIELD	HOUSTON	TX	2466429.	522147.	2310.	14.74	19.86
ASW	ILE	KILLEEN MUNI	KILLEEN	TX	1964283.	445407.	1859.	11.59*	16.01*
ASW	MDD	MIDLAND AIRPARK	MIDLAND	TX	1943066.	374619.	1821.	12.04*	15.40*
ASW	TDW	TRADEWIND	AMARILLO	TX	1503804.	327026.	1399.	9.27*	12.16*
ASW	HPY	HUMPHREY	HOUSTON	TX	1497868.	261223.	1394.	9.03*	11.69*
ASW	DTO	DENTON MUNI	DENTON	TX	1228634.	227671.	1122.	7.24*	9.68*
ASW	TPL	DRAUGHON-MILLER MUNI	TEMPLE	TX	1117432.	291292.	1137.	6.48	9.36
ASW	AAP	ANDRAU AIRPARK	HOUSTON	TX	1167602.	199804.	1110.	8.60*	9.09*
ASW	F42	PHIL L HUDSON FIELD	MESQUITE	TX	1012519.	203616.	942.	6.17*	8.08*
ASW	SPX	HOUSTON GULF	LEAGUE CITY	TX	727633.	125654.	685.	4.17	5.67
ASW	F54	ARLINGTON MUNI	ARLINGTON	TX	645358.	152069.	585.	4.82	5.30
ASW	T02	CLOVER FIELD	HOUSTON	TX	529242.	215960.	0.	5.31	4.95

ASW	LFK	ANGELINA COUNTY	LUFKIN	TX	515024.	187054.	486.	3.24	4.66
ASW	F60	MCGREGOR MUNI	MCGREGOR	TX	478981.	162514.	432.	3.52	4.26
ASW	MWL	MINERAL WELLS	MINERAL WELLS	TX	502177.	87601.	482.	3.11	3.92
ASW	T27	BURNET MUNI KATE CRADDOCK FIELD	BURNET	TX	447658.	116112.	424.	3.11*	3.75*
ASW	T39	HUNTSVILLE MUNI	HUNTSVILLE	TX	484499.	79339.	483.	2.18	3.75
ASW	3R3	TIMS AIRPARK	AUSTIN	TX	433810.	119263.	1085.	7.34	3.67
ASW	GVT	MAJORS	GREENVILLE	TX	444622.	979866.	486.	2.45*	3.48*
ASW	E02	SCHLEMEYER FIELD	ODESSA	TX	367429.	156826.	834.	9.21	3.48
ASW	F18	CLEBURNE MUNI	CLEBURNE	TX	429151.	74757.	400.	2.60*	3.35*
ASW	F67	GRAND PRAIRIE MUNI	GRAND PRAIRIE	TX	304398.	196112.	0.	3.55	3.33
ASW	ALI	ALICE INTERNATIONAL	ALICE	TX	426824.	71041.	3316.	2.05	3.31
ASW	T47	KICKAPOO DOWNTOWN AIRPARK	WICHITA FALLS	TX	393232.	86893.	353.	2.33*	3.19*
ASW	T41	LA PORTE MUNI	LA PORTE	TX	375417.	101058.	1043.	6.76	3.17
ASW	BWD	BROWNWOOD MUNI	BROWNWOOD	TX	303703.	161395.	279.	3.87	3.09
ASW	21XS	BIG SPRING	BIG SPRING	TX	390310.	69776.	360.	2.32*	3.06*
ASW	PRX	COX FLD	PARIS	TX	299977.	155820.	289.	2.41	3.03
ASW	DHT	DALHART MUNI	DALHART	TX	315878.	116966.	262.	2.74	2.88
ASW	F26	DALLAS NORTH	PLANO	TX	243494.	184839.	0.	2.88	2.85
ASW	3R0	BEEVILLE MUNI	BEEVILLE	TX	342328.	60529.	328.	2.00*	2.68*
ASW	F70	MANGHAM FLD	FORT WORTH	TX	282869.	97698.	0.	2.78	2.53
ASW	T69	SINTON	SINTON	TX	322499.	54670.	179.	1.67	2.51
ASW	T29	PEARLAND	PEARLAND	TX	194307.	168784.	0.	2.40	2.41
ASW	DRT	DEL RIO INTL	DEL RIO	TX	226473.	135097.	866.	3.98	2.40
ASW	TRL	TERRELL MUNICIPAL	TERRELL	TX	296631.	54806.	257.	2.33	2.34
ASW	BMT	BEAUMONT MUNI	BEAUMONT	TX	221281.	84509.	716.	4.77	2.03
ASW	T17	WEISER AIR PARK	HOUSTON	TX	226577.	73955.	0.	2.17	2.00
ASW	CNW	JAMES CONNALLY	WACO	TX	233522.	46084.	192.	1.43*	1.86*
ASW	CRS	CORSICANA MUNI	CORSICANA	TX	234539.	43326.	220.	1.36	1.85
ASW	3R1	BAY CITY MUNI	BAY CITY	TX	236195.	41192.	220.	1.42*	1.84*
ASW	GLE	GAINESVILLE MUNI	GAINESVILLE	TX	228635.	43336.	209.	1.80	1.81
ASW	T86	LAKESIDE	HOUSTON	TX	219921.	52108.	955.	4.17	1.81
ASW	LJN	BRAZORIA COUNTY	LAKE JACKSON	TX	122533.	141221.	201.	1.73	1.75
ASW	PSX	PALACIOS MUNI	PALACIOS	TX	224414.	34282.	92.	0.60	1.72
ASW	4R2	HORSESHOE BAY	MARBLE FALLS	TX	210184.	36974.	190.	1.75	1.64
ASW	F03	MT PLEASANT MUNI	MT PLEASANT	TX	204265.	35633.	190.	1.24	1.59
ASW	PEQ	PECOS MUNI	PECOS CITY	TX	181886.	36999.	141.	1.84	1.45
ASW	LNC	LANCASTER	LANCASTER	TX	184255.	33440.	164.	1.93	1.45
ASW	F82	TOWN & COUNTRY AIRPARK	LUBBOCK	TX	154565.	50450.	0.	1.51	1.36
ASW	WEA	PARKER COUNTY	WEATHERFORD	TX	154758.	45493.	517.	3.41	1.33
ASW	JAS	JASPER COUNTY AIRPORT-BELL FIELD	JASPER	TX	171108.	28340.	169.	0.90	1.33
ASW	F69	AIR PARK-DALLAS	DALLAS	TX	150818.	49228.	0.	1.47	1.33
ASW	ASL	HARRISON COUNTY	MARSHALL	TX	167077.	29138.	155.	1.01*	1.30*
ASW	F05	WILBARGER COUNTY	VERNON	TX	163036.	28507.	151.	1.00*	1.27*
ASW	OCH	EAST TEXAS REGIONAL	NACOGDOCHES	TX	62343.	125712.	0.	2.70	1.25
ASW	SNK	WINSTON FIELD	SNYDER	TX	154040.	30152.	120.	1.47	1.22
ASW	BGD	HUTCHINSON COUNTY	BORGER	TX	78646.	101544.	152.	2.11	1.20
ASW	ELA	EAGLE LAKE	EAGLE LAKE	TX	137064.	23465.	130.	0.71	1.07
ASW	PPA	PERRY LEFORS FIELD	PAMPA	TX	129820.	28535.	85.	1.15	1.05
ASW	PSN	PALESTINE MUNI	PALESTINE	TX	122193.	26892.	114.	0.75	0.99
ASW	FST	PECOS COUNTY	FORT STOCKTON	TX	122850.	26290.	87.	1.60	0.99
ASW	T98	SAN MARCOS MUNI	SAN MARCOS	TX	119796.	29535.	465.	2.28	0.99
ASW	CDS	CHILDRESS MUNI	CHILDRESS	TX	126985.	21244.	124.	0.61	0.98
ASW	T04	GEORGETOWN MUNI	GEORGETOWN	TX	107036.	29546.	262.	1.84	0.91
ASW	F46	ROCKWALL MUNI	ROCKWALL	TX	102339.	33405.	0.	1.00	0.90
ASW	F14	WICHITA VALLEY	WICHITA FALLS	TX	94221.	41595.	0.	3.13	0.90
ASW	F39	GRAYSON CO	SHERMAN-DENISON	TX	68992.	65720.	0.	2.41	0.90
ASW	F72	OAK CROVE	FORT WORTH	TX	113181.	20777.	99.	0.65*	0.89*
ASW	SWI	SHERMAN MUNICIPAL	SHERMAN	TX	102327.	29720.	89.	0.83	0.88
ASW	7F3	CADDO MILLS MUN	CADDO MILLS	TX	100014.	32648.	0.	0.98	0.88
ASW	Q70	STRATFORD FIELD	STRATFORD	TX	109636.	21875.	102.	0.67*	0.87*

ASW	ORG	ORANGE COUNTY	ORANGE	TX	75902.	55333.	231.	1.59	0.87
ASW	T80	KLEBERG COUNTY	KINGSVILLE	TX	106916.	20070.	720.	0.88	0.84
ASW	ERV	KERRVILLE MUNI/LOUIS SCHREINER FLD	KERRVILLE	TX	93760.	31985.	67.	2.80	0.84
ASW	E15	GRAHAM MUNI	GRAHAM	TX	102460.	21370.	74.	1.28	0.82
ASW	MRF	MARFA MUNI	MARFA	TX	104548.	19583.	89.	0.87	0.82
ASW	4F2	PANOLA COUNTY	CARTHAGE	TX	103338.	18428.	0.	0.21	0.81
ASW	1F9	BRIDGEPORT MUNI	BRIDGEPORT	TX	98328.	22501.	91.	0.61*	0.80*
ASW	F71	LUCK FIELD	FORT WORTH	TX	87145.	28444.	0.	0.83	0.77
ASW	CZT	DIMMIT COUNTY	CARRIZO SPRINGS	TX	97942.	17081.	91.	0.59*	0.76*
ASW	F44	ATHENS MUNICIPAL	ATHENS	TX	88750.	19577.	77.	0.71	0.72
ASW	T30	MC KINLEY FIELD	PEARSALL	TX	89063.	16253.	78.	0.52*	0.70*
ASW	CLC	CLEAR LAKE METROPORT	CLEAR LAKE CITY	TX	0.	105363.	0.	0.51*	0.70*
ASW	SWW	SWEETWATER MUNI	SWEETWATER	TX	37987.	66463.	0.	0.55	0.69
ASW	CXO	MONTGOMERY COUNTY	CONROE	TX	75885.	24767.	0.	2.81	0.67
ASW	F51	WINNSBORO MUNI	WINNSBORO	TX	80639.	14063.	75.	0.49*	0.63*
ASW	30F	LAKE VIEW	LAKE DALLAS	TX	69130.	22564.	0.	0.67	0.61
ASW	F55	GRANBURY MUNI	GRANBURY	TX	77223.	13368.	74.	0.47*	0.60*
ASW	F12	RUSK COUNTY	HENDERSON	TX	72068.	18915.	224.	1.44	0.60
ASW	3R5	NEW BRAUNFELS MUNI	NEW BRAUNFELS	TX	59285.	30192.	0.	0.61	0.59
ASW	6R7	COLUMBUS	COLUMBUS	TX	73742.	12644.	70.	0.49*	0.57*
ASW	15R	KARDYS	CIBOLO	TX	61002.	19911.	0.	0.58	0.54
ASW	Q28	HEREFORD MUNI	HEREFORD	TX	61668.	20131.	0.	1.48	0.54
ASW	T82	GILLESPIE COUNTY	FREDERICKSBURG	TX	69146.	12059.	64.	0.42*	0.54*
ASW	Q27	DUMAS MUNI	DUMAS	TX	61229.	19986.	0.	0.60	0.54
ASW	RKP	ARANSAS CO	ROCKPORT	TX	60325.	18894.	33.	2.01	0.53
ASW	T99	WESTSIDE AIRPARK	SAN ANTONIO	TX	57734.	18844.	0.	0.55	0.51
ASW	6R9	LLANO MUNI	LLANO	TX	65287.	11383.	60.	0.39*	0.51*
ASW	0F2	BOWIE MUNI	BOWIE	TX	61743.	11612.	52.	0.52	0.49
ASW	SEP	CLARK FIELD MUNI	STEPHENVILLE	TX	46581.	27716.	0.	1.57	0.49
ASW	Q55	DIMMITT MUNI	DIMMITT	TX	54935.	17934.	0.	0.54	0.48
ASW	8F7	DECATUR MUNI	DECATUR	TX	61888.	10955.	57.	0.36*	0.48*
ASW	F17	CENTER MUNI	CENTER	TX	28583.	40859.	0.	0.39	0.46
ASW	PYX	PERRYTON OCHILTREE COUNTY	PERRYTON	TX	51411.	16782.	0.	1.30	0.45
ASW	20R	CRYSTAL CITY MUNI	CRYSTAL CITY	TX	57601.	10045.	54.	0.35*	0.45*
ASW	15F	HASKELL MUNI	HASKELL	TX	56581.	11874.	40.	0.69	0.45
ASW	INK	WINKLER COUNTY	WINK	TX	56597.	10586.	52.	0.58	0.45
ASW	CFD	COULTER FIELD	BRYAN	TX	52849.	13717.	172.	1.11	0.44
ASW	E16	SHALLOWATER	SHALLOWATER	TX	50108.	16355.	0.	0.48	0.44
ASW	T89	CASTROVILLE MUNI	CASTROVILLE	TX	48700.	15896.	0.	0.47	0.43
ASW	T18	BROOKS COUNTY	FALFURRIAS	TX	55172.	9990.	103.	0.39	0.43
ASW	Q47	SPEARMAN	SPEARMAN	TX	47883.	15629.	0.	0.47	0.42
ASW	UVA	GARNER FIELD	UVALDE	TX	47199.	15408.	0.	1.07	0.42
ASW	T15	MARLIN	MARLIN	TX	52052.	9087.	48.	0.32*	0.41*
ASW	OZA	OZONA MUNI	OZONA	TX	30703.	31680.	0.	0.37	0.41
ASW	T65	MID VALLEY	WESLACO	TX	46810.	15279.	0.	0.46	0.41
ASW	Q26	TERRY COUNTY	BROWNFIELD	TX	37053.	22935.	0.	0.40	0.40
ASW	6F4	ELMDALE AIRPARK	ABILENE	TX	45751.	14933.	0.	0.44	0.40
ASW	3F9	MINEOLA WISENER FIELD	MINEOLA	TX	51016.	9028.	46.	0.29*	0.40*
ASW	2F5	LAMESA MUNI	LAMESA	TX	45665.	14905.	0.	1.42	0.40
ASW	23F	GOODE	KELLER	TX	43990.	14362.	0.	0.42	0.39
ASW	TX04	WEST TEXAS	EL PASO	TX	43963.	14353.	0.	0.42	0.39
ASW	Q24	LEVELLAND MUNI	LEVELLAND	TX	38111.	17806.	0.	0.39	0.37
ASW	COT	COTULLA MUNICIPAL	COTULLA	TX	47449.	8111.	61.	0.38*	0.37*
ASW	T97	CALHOUN COUNTY	PORT LAVACA	TX	46065.	8034.	43.	0.28*	0.36*
ASW	E38	ALPINE MUNI	ALPINE	TX	27552.	24793.	0.	0.98	0.35
ASW	Q06	CITY OF TULIA/SWISHER COUNTY MUNI	TULIA	TX	38786.	12662.	0.	0.38	0.34
ASW	84R	SMITHVILLE MUNI	SMITHVILLE	TX	38126.	12444.	0.	0.36	0.34
ASW	9R5	HUNT	PORTLAND	TX	38126.	12444.	0.	0.36	0.34
ASW	F49	SLATON MUNI	SLATON	TX	38905.	12700.	0.	0.38	0.34
ASW	F41	ENNIS MUNI	ENNIS	TX	38005.	12403.	0.	0.37	0.33

ASW	F04	SAGINAW	FORT WORTH	TX	37037.	12089.	0.	0.35	0.33
ASW	T92	MASON COUNTY	MASON	TX	39330.	9521.	37.	0.26*	0.32*
ASW	F13	CHEROKEE COUNTY	JACKSONVILLE	TX	36553.	11931.	0.	1.21	0.32
ASW	69R	EDWARDS COUNTY	ROCKSPRINGS	TX	42065.	6604.	138.	0.16	0.32
ASW	RFG	ROOKE FIELD	REFUGIO	TX	37004.	9748.	113.	0.73	0.31
ASW	Q54	BENGER AIR PARK	FRIONA	TX	34421.	11236.	0.	0.34	0.30
ASW	1E5	HEMPHILL COUNTY	CANADIAN	TX	35405.	9524.	12.	0.73	0.30
ASW	5R5	WHARTON MUNI	WHARTON	TX	33878.	11058.	0.	1.11	0.30
ASW	T00	CHAMBERS COUNTY	ANAHUAC	TX	33929.	11075.	0.	0.33	0.30
ASW	T90	GUADALUPE COUNTY	SEGUIN	TX	33878.	11058.	0.	0.33	0.30
ASW	6R4	BIRD'S NEST	AUSTIN	TX	35479.	9233.	114.	0.74	0.30
ASW	52F	AERO VALLEY	ROANOKE	TX	33270.	10862.	0.	0.32	0.29
ASW	61F	KEZER AIR RANCH	SPRINGTOWN	TX	31487.	10278.	0.	0.30	0.28
ASW	2F7	COMMERCE MUNI	COMMERCE	TX	34559.	6027.	32.	0.21*	0.27*
ASW	EGP	EAGLE PASS MUNI	EAGLE PASS	TX	29645.	9768.	0.	0.29	0.26
ASW	Q41	FLOYDADA MUNI	FLOYDADA	TX	29644.	9676.	0.	0.29	0.26
ASW	F00	JONES FIELD	BONHAM	TX	29644.	9576	0.	0.29	0.26
ASW	BKD	STEPHENS COUNTY	BRECKENRIDGE	TX	29755.	9691.	1.	0.97	0.26
ASW	E52	VEGA-OLDHAM COUNTY	VEGA	TX	28833.	9413.	0.	0.28	0.25
ASW	T53	NUECES COUNTY	ROBSTOWN	TX	27527.	8985.	0.	0.27	0.24
ASW	T72	HEARNE MUNI	HEARNE	TX	27526.	8984.	0.	0.27	0.24
ASW	ONY	OLNEY MUNI	OLNEY	TX	24812.	11802.	81.	0.54	0.24
ASW	Q43	SUNRAY	SUNRAY	TX	26687.	8711.	0.	0.26	0.24
ASW	ECE	EL CAMPO METRO AIRPORT INC	EL CAMPO	TX	27632.	9019.	0.	0.27	0.24
ASW	40F	FLYING TIGERS	PARIS	TX	22297.	13163.	0.	0.23	0.24
ASW	E11	ANDREWS COUNTY	ANDREWS	TX	27527.	8985.	0.	0.90	0.24
ASW	T78	LIBERTY MUNI	LIBERTY	TX	26463.	8637.	0.	0.26	0.23
ASW	T31	PORT ISABEL-CAMERON COUNTY	PORT ISABEL	TX	26882.	7237.	75.	0.49	0.23
ASW	TX05	AERO COUNTRY	MCKINNEY	TX	26214.	8555.	0.	0.25	0.23
ASW	VHN	CULBERSON COUNTY	VAN HORN	TX	26462.	8637.	0.	0.87	0.23
ASW	SLR	SULPHUR SPRINGS MUNI	SULPHUR SPRINGS	TX	18428.	15725.	0.	0.76	0.23
ASW	31R	GIDDINGS-LEE COUNTY	GIDDINGS	TX	29676.	5174.	27.	0.18*	0.23*
ASW	E35	FABENS	FABENS	TX	25054.	8178.	0.	0.24	0.22
ASW	ATA	ATLANTA MUNI	ATLANTA	TX	25408.	8293.	0.	0.83	0.22
ASW	E13	CRANE COUNTY	CRANE	TX	25408.	8293.	0.	0.25	0.22
ASW	E29	SONORA MUNI	SONORA	TX	23689.	7461.	13.	0.73	0.21
ASW	Q46	EDWARD WARREN FLD	MULESHOE	TX	23393.	7636.	0.	0.23	0.21
ASW	59F	SEAGOVILLE	SEAGOVILLE	TX	23965.	7822.	0.	0.23	0.21
ASW	E01	ROY HURD MEMORIAL	MONAHANS	TX	24350.	7948.	0.	0.24	0.21
ASW	3F6	DAN E RICHARDS MUNICIPAL	PADUCAH	TX	23323.	7613.	0.	0.23	0.21
ASW	26R	JACKSON COUNTY	EDNA	TX	22234.	7257.	0.	0.22	0.20
ASW	2R9	KARNES COUNTY	KENEDY	TX	23135.	6296.	61.	0.40	0.20
ASW	3R9	LAKEWAY AIRPARK	AUSTIN	TX	23065.	7527.	0.	0.22	0.20
ASW	F06	MARIAN AIRPARK	WELLINGTON	TX	22198.	7246.	0.	0.22	0.20
ASW	07R	BISHOP MUNI	BISHOP	TX	21786.	7111.	0.	0.21	0.19
ASW	00R	LIVINGSTON MUNI	LIVINGSTON	TX	21344.	6967.	0.	0.20	0.19
ASW	11R	BRENHAM MUNI	BRENHAM	TX	22478.	5896.	70.	0.58	0.19
ASW	BBD	CURTIS FIELD	BRADY	TX	21170.	6910.	0.	0.21	0.19
ASW	F56	ARLEDGE FIELD	STAMFORD	TX	21170.	6910.	0.	0.21	0.19
ASW	3F0	BLUE MOUND	FORT WORTH	TX	19608.	7290.	0.	0.19	0.18
ASW	COM	COLEMAN MUNI	COLEMAN	TX	21541.	5513.	74.	0.50	0.18
ASW	1F3	HARTLEE FIELD	DENTON	TX	20525.	6700.	0.	0.20	0.18
ASW	TX80	FOLLETT/LIPSCOMB COUNTY	FOLLETT	TX	21501.	5708.	64.	0.41	0.18
ASW	JCT	KIMBLE COUNTY	JUNCTION	TX	23048.	4020.	21.	0.14*	0.18*
ASW	ETN	EASTLAND MUNI	EASTLAND	TX	20274.	5276.	65.	0.42	0.17
ASW	E57	DENVER CITY	DENVER CITY	TX	19057.	6220.	0.	0.19	0.17
ASW	F25	OBRIEN AIRPARK	WAXAHACHIE	TX	18518.	6044.	0.	0.18	0.16
ASW	2F9	TOM DANAHER	WICHITA FALLS	TX	18518.	6044.	0.	0.18	0.16
ASW	07F	GLADEWATER MUNI	GLADEWATER	TX	17624.	5752.	0.	0.17	0.16
ASW	1E9	GARTRELL FIELD	CANYON	TX	18518.	6044.	0.	0.18	0.16

ASW	TX06	MEXIA-LIMESTONE CO.	MEXIA	TX	18502.	4874.	57.	0.36	0.16
ASW	74R	HORIZON	SAN ANTONIO	TX	17873.	5833.	0.	0.17	0.16
ASW	T28	LAMPASAS	LAMPASAS	TX	19066.	4841.	67.	0.38	0.16
ASW	F75	KNOX CITY MUNI	KNOX CITY	TX	17191.	5611.	0.	0.16	0.15
ASW	23R	DEVINE MUNI	DEVINE	TX	16708.	5453.	0.	0.16	0.15
ASW	7F6	CLARKSVILLE-RED RIVER CO	CLARKSVILLE	TX	16938.	5528.	0.	0.16	0.15
ASW	7R9	BAILES	ANGLETON	TX	17445.	5694.	0.	0.17	0.15
ASW	T03	GENOA	GENOA	TX	16253.	5306.	0.	0.16	0.14
ASW	3F2	CISCO MUNI	CISCO	TX	11646.	9168.	0.	0.13	0.14
ASW	T42	BALL	VICTORIA	TX	15998.	5222.	0.	0.15	0.14
ASW	45R	HARDIN COUNTY	KOUNTZE/SILSBEE	TX	15830.	5183.	0.	0.15	0.14
ASW	6R3	CLEVELAND MUNI	CLEVELAND	TX	14819.	4837.	0.	0.14	0.13
ASW	T74	TAYLOR MUNI	TAYLOR	TX	14218.	4641.	0.	0.14	0.13
ASW	64R	PEARLAND	PEARLAND	TX	16463.	3798.	77.	0.20	0.13
ASW	F98	YOAKUM COUNTY	PLAINS	TX	14161.	4622.	0.	0.14	0.12
ASW	Q00	MUNICIPAL	LITTLEFIELD	TX	13761.	4492.	0.	0.13	0.12
ASW	5F1	POST-GARZA COUNTY MUNI	POST	TX	13903.	4538.	0.	0.14	0.12
ASW	F85	COCHRAN COUNTY	MORTON	TX	13367.	4363.	0.	0.13	0.12
ASW	T96	EL CAMPO AIRPARK	EL CAMPO	TX	12504.	4082.	0.	0.12	0.11
ASW	E45	IRAAN MUNI	IRAAN	TX	10893.	3556.	0.	0.10	0.10
ASW	T12	KIRBYVILLE	KIRBYVILLE	TX	10893.	3556.	0.	0.10	0.10
ASW	9F9	SYCAMORE STRIP	FORT WORTH	TX	10952.	3575.	0.	0.11	0.10
ASW	81R	SAN SABA COUNTY MUNICIPAL	SAN SABA	TX	10893.	3556.	0.	0.10	0.10
ASW	31F	GAINES COUNTY	SEMINOLE	TX	11645.	3801.	0.	0.11	0.10
ASW	PEZ	PLEASANTON MUNI	PLEASANTON	TX	11646.	3801.	0.	0.11	0.10
ASW	F21	MEMPHIS MUNI	MEMPHIS	TX	10585.	3455.	0.	0.10	0.09
ASW	77F	WINTERS MUNI	WINTERS	TX	11355.	2941.	37.	0.24	0.09
ASW	7F7	CLIFTON MUNI	CLIFTON	TX	10585.	3455.	0.	0.10	0.09
ASW	60F	SEYMOUR MUNI	SEYMOUR	TX	10585.	3455.	0.	0.10	0.09
ASW	60R	NAVASOTA MUNI	NAVASOTA	TX	11870.	2070.	11.	0.07*	0.09*
ASW	T26	BAY CITY	BAY CITY	TX	10076.	3289.	0.	0.10	0.09
ASW	F83	ABERNATHY MUNI	ABERNATHY	TX	9055.	2956.	0.	0.09	0.08
ASW	T56	HOUSTON COUNTY	CROCKETT	TX	8927.	2914.	0.	0.09	0.08
ASW	F97	SEAGRAVES	SEAGRAVES	TX	9446.	3083.	0.	0.09	0.08
ASW	E34	CLARENDON MUNI	CLARENDON	TX	8715.	2844.	0.	0.08	0.08
ASW	7F9	COMANCHE COUNTY-CITY	COMANCHE	TX	9589.	3130.	0.	0.09	0.08
ASW	T21	HAMILTON MUNI	HAMILTON	TX	9527.	3110.	0.	0.09	0.08
ASW	4F4	GILMER-UPSHUR COUNTY	GILMER	TX	7414.	2420.	0.	0.07	0.07
ASW	54R	ZUEHL	MARION	TX	8254.	2695.	0.	0.08	0.07
ASW	8F4	FOARD COUNTY	CROWELL	TX	8465.	2763.	0.	0.08	0.07
ASW	T94	TWIN-OAKS	SAN ANTONIO	TX	8476.	2767.	0.	0.08	0.07
ASW	F64	FLYING OAKS	FORT WORTH	TX	7999.	2611.	0.	0.08	0.07
ASW	21F	JACKSBORO MUNI	JACKSBORO	TX	8484.	2769.	0.	0.08	0.07
ASW	TX07	PRESIDIO LELY INTL	PRESIDIO	TX	8272.	2700.	0.	0.08	0.07
ASW	F01	QUANAH MUNI	QUANAH	TX	7415.	2420.	0.	0.07	0.07
ASW	E30	BRUCE FIELD	BALLINGER	TX	8466.	2763.	0.	0.08	0.07
ASW	8F3	CROSBYTON MUNI	CROSBYTON	TX	6352.	2073.	0.	0.06	0.06
ASW	05F	CITY-COUNTY	GATESVILLE	TX	6352.	2073.	0.	0.06	0.06
ASW	28F	ALTA VISTA	KELLER	TX	6552.	2139.	0.	0.06	0.06
ASW	9R4	TANNER'S	PORT LAVACA	TX	5701.	1861.	0.	0.05	0.05
ASW	F66	CARROLL AIR PARK	DE SOTO	TX	5531.	1806.	0.	0.05	0.05
ASW	T33	FLYING L RANCH	BANDERA	TX	5447.	1778.	0.	0.05	0.05
ASW	34R	HALLETTSVILLE MUNI	HALLETTSVILLE	TX	6203.	2024.	0.	0.06	0.05
ASW	37F	MUNDAY MUNICIPAL	MUNDAY	TX	6122.	1998.	0.	0.06	0.05
ASW	1E4	PALO DURO	AMARILLO	TX	6194.	2022.	0.	0.06	0.05
ASW	70F	FLYING HEART RANCH	WACO	TX	4000.	1306.	0.	0.04	0.04
ASW	9F0	DUBLIN MUNICIPAL	DUBLIN	TX	4237.	1383.	0.	0.04	0.04
ASW	68F	TEAGUE MUNICIPAL	TEAGUE	TX	3064.	1000.	0.	0.03	0.03
ASW	46F	LAVON NORTH	DALLAS	TX	2129.	695.	0.	0.02	0.02
ASW	63F	MUNI	STANTON	TX	1606.	524.	0.	0.02	0.01

ASW	TA41	SUNLAND AIRPARK	EL PASO	TX	1702.	556.	0.	0.02	0.01

WESTERN PACIFIC REGION

AWP	P16	FALCON FIELD	MESA	AZ	509984.	271816.	0.	6.45	5.19
AWP	PRC	PRESCOTT MUNI	PRESCOTT	AZ	475662.	259389.	3.	15.69	4.89
AWP	P08	COOLIDGE FLORENCE MUNI	COOLIDGE	AZ	336338.	109791.	0.	3.88	2.96
AWP	P37	GLENDALE MUNI	GLENDALE	AZ	310413.	115502.	0.	2.97	2.83
AWP	FHU	SIERRA VISTA MUNI	SIERRA V	AZ	216665.	149470.	264.	1.57*	2.43*
AWP	INW	WINSLOW MUNI	WINSLOW	AZ	178958.	147198.	97.	4.51	2.17
AWP	P10	CHANDLER MUNI	CHANDLER	AZ	184867.	112980.	0.	1.92	1.98
AWP	PGA	PAGE MUNICIPAL	PAGE	AZ	116369.	143344.	0.	4.66	1.73
AWP	LHU	LAKE HAVASU CITY	LAKE HAVASU CITY	AZ	101116.	138343.	1.	4.57	1.59
AWP	P06	BULLHEAD CITY	BULLHEAD CITY	AZ	100047.	138013.	0.	1.44	1.58
AWP	E63	GILA BEND MUNI	GILA BEND	AZ	127504.	94376.	0.	1.36	1.47
AWP	P14	HOLBROOK MUNI	HOLBROOK	AZ	140048.	63293.	0.	1.37	1.35
AWP	P34	WINDOW ROCK	WINDOW ROCK	AZ	73574.	120591.	51.	0.94*	1.29*
AWP	RYN	RYAN FIELD	TUCSON	AZ	138564.	48129.	0.	1.31	1.24
AWP	SOW	SHOW LOW MUNI	SHOW LOW	AZ	59512.	116346.	0.	0.92	1.17
AWP	DUG	BISBEE DOUGLAS INTL	DOUGLAS BISBEE	AZ	86827.	85256.	11.	2.92	1.14
AWP	SEZ	SEDONA	SEDONA	AZ	74106.	74318.	66.	0.60*	0.99*
AWP	P33	COCHISE COUNTY	WILLCOX	AZ	94333.	42037.	0.	0.92	0.91
AWP	SJN	ST JOHNS MUNI	ST JOHNS	AZ	41718.	93371.	152.	1.40	0.90
AWP	E14	AVRA VALLEY	TUCSON	AZ	98464.	32148.	0.	0.93	[illegible]
AWP	E18	CAREFREE	CAREFREE	AZ	16956.	110897.	0.	0.66	0.85
AWP	Q35	SPRINGERVILLE-EAGAR MUNI	SPRINGERVILLE	AZ	15091.	110289.	0.	0.65	0.83
AWP	P32	WILLIAMS MUNI	WILLIAMS	AZ	9712.	108533.	0.	0.60	0.79
AWP	SAD	SAFFORD MUNI	SAFFORD	AZ	58650.	45509.	0.	0.64	0.69
AWP	CGZ	CASA GRANDE MUNI	CASA GRANDE	AZ	72976.	23823.	0.	0.69	0.64
AWP	IGM	MOHAVE COUNTY	KINGMAN	AZ	37659.	57816.	1.	1.00	0.63
AWP	E51	BAGDAD	BAGDAD	AZ	25910.	64677.	0.	0.42	0.60
AWP	P52	COTTONWOOD	COTTONWOOD	AZ	23854.	66364.	0.	0.41	0.60
AWP	P20	PARKER MUNI	PARKER	AZ	43694.	46465.	0.	0.51	0.60
AWP	L07	MEMORIAL AIRFIELD	CHANDLER	AZ	63325.	20675.	0.	0.58	0.56
AWP	4PH	POLACCA	POLACCA	AZ	7315.	71961.	0.	0.29	0.53
AWP	4E0	TAYLOR	TAYLOR	AZ	7339.	66628.	0.	0.27	0.49
AWP	P13	GLOBE-SAN CARLOS REGIONAL AIR FACILITY	GLOBE	AZ	38120.	24136.	0.	0.39	0.41
AWP	E55	PIERCE	BUCKEYE	AZ	45850.	14969.	0.	0.42	0.40
AWP	P19	STELLAR AIRPARK	CHANDLER	AZ	41402.	13515.	0.	0.38	0.36
AWP	OLS	NOGALES INTL	NOGALES	AZ	38715.	12635.	0.	0.36	0.34
AWP	E69	PAYSON	PAYSON	AZ	24814.	14381.	0.	0.25	0.26
AWP	MZJ	MARANA AIRPARK	MARANA	AZ	27759.	9131.	0.	0.26	0.25
AWP	E60	ELOY MUNI	ELOY	AZ	14188.	22201.	0.	0.19	0.24
AWP	DGL	DOUGLAS MUNI	DOUGLAS	AZ	22373.	7304.	0.	0.22	0.20
AWP	E19	TURF	PHOENIX	AZ	22115.	7219.	0.	0.22	0.19
AWP	TBC	TUBA CITY	TUBA CITY	AZ	14159.	4621.	0.	0.13	0.12
AWP	P04	BISBEE MUNI	BISBEE	AZ	7907.	8205.	0.	0.09	0.11
AWP	BXK	BUCKEYE MUNI	BUCKEYE	AZ	11469.	3744.	0.	0.11	0.10
AWP	E25	WICKENBURG MUNI	WICKENBURG	AZ	9062.	5101.	0.	0.09	0.09
AWP	01E	HEREFORD	SIERRA VISTA	AZ	7862.	2566.	0.	0.07	0.07
AWP	E78	SELLS	SELLS	AZ	7002.	2285.	0.	0.06	0.06
AWP	E24	WHITERIVER	WHITERIVER	AZ	6376.	2081.	0.	0.06	0.06
AWP	E64	FRAM	GLENDALE	AZ	5175.	1689.	0.	0.05	0.05
AWP	CFT	GREENLEE COUNTY	CLIFTON-MORENCI	AZ	6239.	2036.	0.	0.06	0.05
AWP	0V7	KAYENTA	KAYENTA	AZ	3901.	1273.	0.	0.04	0.03
AWP	U30	TEMPLE BAR	TEMPLE BAR	AZ	1484.	3302.	0.	0.02	0.03
AWP	E58	THREE POINT	CASA GRANDE	AZ	2433.	794.	0.	0.02	0.02
AWP	E76	RIMROCK	RIMROCK	AZ	1572.	513.	0.	0.01	0.01

AWP	Q32	CHINLE	CHINLE	AZ	1609.	525.	0.	0.02	0.01
AWP	PRB	PASO ROBLES MUNI	PASO ROBLES	CA	1610708.	372034.	1759.	9.73*	13.17*
AWP	RBL	RED BLUFF MUNI	RED BLUFF	CA	1488074.	322699.	1688.	4.65	12.03
AWP	ACV	ARCATA	ARCATA/EUREKA/	CA	1171275.	300033.	1235.	3.69	9.78
AWP	CCB	CABLE	UPLAND	CA	1124527.	226931.	988.	4.59	8.98
AWP	VIS	VISALIA MUNI	VISALIA	CA	796231.	255095.	722.	8.20	6.99
AWP	L47	SANTA YNEZ	SANTA YNEZ	CA	691418.	157397.	707.	5.38*	5.64*
AWP	103	LODI	LODI	CA	662685.	118174.	677.	4.86*	5.19*
AWP	L66	CORONA MUNI	CORONA	CA	550587.	179718.	0.	17.66	4.85
AWP	PTV	PORTERVILLE MUNI	PORTERVILLE	CA	559086.	153088.	447.	8.34	4.73
AWP	WVI	WATSONVILLE MUNI	WATSONVILLE	CA	548224.	143677.	579.	3.69*	4.60*
AWP	WLW	WILLOWS-GLENN COUNTY	WILLOWS	CA	556337.	88185.	615.	1.93	4.28
AWP	008	COLUSA COUNTY	COLUSA	CA	475847.	82761.	484.	3.31*	3.71*
AWP	CMA	CAMARILLO	CAMARILLO	CA	398449.	154109.	0.	4.25	3.67
AWP	SBP	SAN LUIS OBISPO COUNTY	SAN LUIS OBISPO	CA	301185.	203580.	4.	12.94	3.35
AWP	056	GNOSS FLD	NOVATO	CA	294359.	201457.	0.	3.53	3.29
AWP	CPM	COMPTON	COMPTON	CA	342422.	123896.	0.	3.27	3.10
AWP	000	ALTURAS MUNI	ALTURAS	CA	303514.	144371.	311.	2.71*	2.98*
AWP	LSN	LOS BANOS MUNI	LOS BANOS	CA	357623.	76392.	329.	4.05	2.88
AWP	UDD	BERMUDA DUNES	BERMUDA DUNES	CA	366382.	63077.	372.	2.51*	2.85*
AWP	SBT	TRI CITY	SAN BERNARDINO	CA	316282.	108686.	331.	2.27	2.82
AWP	WHP	WHITEMAN	LOS ANGELES	CA	293680.	105501.	0.	2.74	2.65
AWP	022	COLUMBIA	COLUMBIA	CA	220440.	177307.	0.	2.81	2.64
AWP	Q60	SIERRA SKY PARK	FRESNO	CA	208582.	159745.	0.	2.43	2.45
AWP	CEC	JACK MC NAMARA FIELD	CRESCENT CITY	CA	276808.	84203.	325.	0.87	2.40
AWP	L67	RIALTO MUNI /MIRO FLD/	RIALTO	CA	265160.	92181.	0.	2.59	2.37
AWP	SIY	SISKIYOU COUNTY	MONTAGUE	CA	208638.	141705.	208.	1.80*	2.33*
AWP	OVE	OROVILLE MUNI	OROVILLE	CA	182915.	165067.	0.	2.42	2.31
AWP	LPC	LOMPOC	LOMPOC	CA	212049.	132019.	0.	2.46	2.29
AWP	045	NUT TREE	VACAVILLE	CA	256466.	83695.	0.	12.93	2.26
AWP	011	PHOENIX FIELD	FAIR OAKS	CA	167845.	160145.	0.	2.26	2.18
AWP	TRK	TRUCKEE-TAHOE	TRUCKEE	CA	165454.	159363.	0.	7.41	2.16
AWP	085	BENTON FIELD	REDDING	CA	157396.	156738.	0.	2.1[illegible]	2.09
AWP	PVF	PLACERVILLE	PLACERVILLE	CA	159959.	145247.	0.	2.03	2.03
AWP	017	NEVADA COUNTY AIR PARK	GRASS VALLEY	CA	186331.	109139.	0.	2.13	1.96
AWP	BLH	BLYTHE	BLYTHE	CA	130579.	145340.	16.	5.48	1.83
AWP	L16	MEADOWLARK	HUNTINGTON BEACH	CA	206151.	67302.	0.	1.92	1.82
AWP	Q99	SOUTH COUNTY ARPT OF SANTA CLARA COUNTY	SAN MARTIN	CA	204216.	66661.	0.	2.14	1.80
AWP	041	WOODLAND-WATTS FLD	WOODLAND	CA	150645.	116627.	0.	5.22	1.78
AWP	FOT	ROHNERVILLE	FORTUNA	CA	223286.	40572.	216.	1.75	1.75
AWP	307	HOLLISTER MUNI	HOLLISTER	CA	160014.	100508.	0.	1.85	1.73
AWP	AVX	CATALINA	AVALON	CA	125765.	118596.	0.	1.60	1.62
AWP	EED	NEEDLES	NEEDLES	CA	206533.	35196.	300.	1.57*	1.61*
AWP	2Q3	YOLO COUNTY	WINTERS/DAVIS/WOODLAND	CA	183236.	59814.	0.	1.92	1.61
AWP	DLO	DELANO MUNI	DELANO	CA	156387.	78129.	118.	2.14	1.56
AWP	SZP	SANTA PAULA	SANTA PAULA	CA	164459.	68148.	0.	1.59	1.55
AWP	RIR	RIVERSIDE FLA-BOB	RIVERSIDE/RUBIDOUX/	CA	175708.	57360.	0.	1.64	1.55
AWP	BWC	BRAWLEY MUNI	BRAWLEY	CA	149334.	77739.	0.	1.67	1.51
AWP	Q33	MAINE PRAIRIE	DIXON	CA	165120.	53910.	0.	1.66	1.46
AWP	027	OAKDALE	OAKDALE	CA	171746.	44689.	138.	1.58	1.44
AWP	Q59	FREMONT	FREMONT	CA	144072.	71083.	0.	1.60	1.43
AWP	Q53	FRANKLIN FIELD	FRANKLIN	CA	158964.	51874.	0.	1.66	1.40
AWP	UKI	UKIAH MUNI	UKIAH	CA	79867.	131429.	0.	4.02	1.40
AWP	001	SANTA ROSA AIR CENTER	SANTA ROSA	CA	157217.	51316.	0.	1.64	1.39
AWP	HAF	HALF MOON BAY	HALF MOON BAY	CA	152180.	56904.	0.	1.62	1.39
AWP	HMT	HEMET-RYAN	HEMET	CA	149230.	48792.	0.	1.56	1.32
AWP	SRU	SKYPARK	SANTA CRUZ	CA	104906.	92164.	0.	1.31	1.31
AWP	MMH	MAMMOTH LAKES	MAMMOTH LAKES	CA	67158.	127282.	0.	1.21	1.29
AWP	105	MONTAGUE-YREKA	MONTAGUE	CA	65125.	126617.	0.	1.18	1.27

AWP	CLG	COALINGA MUNI	COALINGA	CA	60785.	123023.	0.	1.09	1.22
AWP	005	CHESTER	CHESTER	CA	133514.	46782.	136.	1.18*	1.20*
AWP	053	CALISTOGA AIRPARK	CALISTOGA	CA	135955.	44384.	0.	1.42	1.20
AWP	L12	REDLANDS MUNI	REDLANDS	CA	90665.	87412.	0.	1.17	1.18
AWP	005	UNIVERSITY	DAVIS	CA	134753.	43518.	491.	3.47	1.18
AWP	CXL	CALEXICO INTL	CALEXICO	CA	89183.	87015.	0.	1.15	1.17
AWP	089	FALL RIVER MILLS	FALL RIVER MILLS	CA	52659.	122550.	0.	1.06	1.16
AWP	036	TRACY MUNI	TRACY	CA	117954.	50630.	0.	3.13	1.12
AWP	102	LAMPSON	LAKEPORT	CA	102386.	57625.	0.	1.16	1.06
AWP	BIH	BISHOP	BISHOP	CA	41230.	118819.	0.	2.44	1.06
AWP	069	PETALUMA SKY RANCH	PETALUMA	CA	99591.	56112.	0.	1.13	1.03
AWP	AUN	AUBURN MUNI	AUBURN	CA	87327.	62241.	0.	1.03	0.99
AWP	OCN	OCEANSIDE MUNI	OCEANSIDE	CA	103093.	45776.	0.	1.12	0.99
AWP	018	HANFORD MUNI	HANFORD	CA	109548.	35757.	0.	3.86	0.97
AWP	TSP	TEHACHAPI-KERN COUNTY	TEHACHAPI	CA	54551.	90167.	0.	0.84	0.96
AWP	012	ANTIOCH	ANTIOCH	CA	107424.	35064.	0.	1.12	0.95
AWP	MHV	MOJAVE	MOJAVE	CA	32304	108357.	0.	0.74	0.93
AWP	0Q3	SONOMA VALLEY	SCHELLVILLE-SONOMA	CA	104906.	34239.	0.	1.10	0.92
AWP	048	MENDOCINO COUNTY	LITTLE RIVER	CA	22017.	112550.	0.	0.74	0.89
AWP	L45	BAKERSFIELD AIRPARK	BAKERSFIELD	CA	99591.	32506.	0.	1.04	0.88
AWP	IYK	INYOKERN-KERN COUNTY	INYOKERN	CA	19647.	111775.	0.	0.71	0.87
AWP	TLR	TULARE MUNICIPAL	TULARE	CA	92764.	33680.	0.	0.98	0.84
AWP	MAE	MADERA MUNI	MADERA	CA	85154.	35025.	0.	4.61	0.80
AWP	L39	RAMONA	RAMONA	CA	90205.	29447.	0.	0.94	0.80
AWP	L08	BORREGO VALLEY	BORREGO SPRINGS	CA	65206.	51497.	0.	0.79	0.78
AWP	Q68	PINE MOUNTAIN LAKE	GROVELAND	CA	34129.	83631.	0.	0.63	0.78
AWP	TRM	THERMAL	THERMAL	CA	88195.	28784.	0.	0.92	0.78
AWP	088	RIO VISTA MUNI	RIO VISTA	CA	84951.	28898.	0.	0.89	0.76
AWP	L49	SKYLARK FIELD	ELSINORE	CA	86162.	28131.	0.	0.90	0.76
AWP	034	CALAVERAS COUNTY	SAN ANDREAS	CA	58611.	54512.	0.	0.71	0.75
AWP	206	CHOWCHILLA	CHOWCHILLA	CA	69263.	37069.	0.	0.78	0.71
AWP	070	WESTOVER FLD AMADOR COUNTY	JACKSON	CA	62965.	39858.	0.	0.73	0.68
AWP	BNG	BANNING MUNI	BANNING	CA	68258.	31939.	0.	0.75	0.67
AWP	L71	CALIFORNIA CITY MUNI	CALIFORNIA CITY	CA	68276.	31929.	0.	0.75	0.67
AWP	L35	BIG BEAR CITY	BIG BEAR	CA	72598.	23692.	0.	0.76	0.64
AWP	L70	AGUA DULCE AIRPARK	AGUA DULCE	CA	73134.	23869.	0.	0.76	0.64
AWP	L65	PERRIS VALLEY	PERRIS	CA	71359.	23296.	0.	0.72	0.63
AWP	2L0	RANCHO CALIFORNIA	TEMECULA	CA	51676.	43671.	0.	0.61	0.63
AWP	0Q4	SELMA	SELMA	CA	58780.	34986.	0.	0.67	0.62
AWP	052	SUTTER COUNTY	YUBA CITY	CA	63512.	26356.	0.	0.68	0.60
AWP	SVE	SUSANVILLE MUNI	SUSANVILLE	CA	39351.	49017.	0.	0.55	0.59
AWP	SFR	SAN FERNANDO	SAN FERNANDO	CA	66840.	21818.	0.	0.63	0.59
AWP	061	CAMERON AIRPARK	SHINGLE SPRINGS	CA	58243.	28655.	0.	0.64	0.58
AWP	054	WEAVERVILLE	WEAVERVILLE	CA	29375.	57871.	0.	0.49	0.58
AWP	L52	OCEANO-COUNTY	OCEANO	CA	65068.	21236.	0.	0.66	0.57
AWP	051	LINCOLN MUNI	LINCOLN	CA	60686.	56891.	0.	0.46	0.56
AWP	042	WOODLAKE	WOODLAKE	CA	46161.	37559.	0.	0.56	0.56
AWP	209	PEARCE FIELD	LOWER LAKE	CA	60872.	19867.	0.	0.64	0.54
AWP	Q94	RIO LINDA	RIO LINDA	CA	57627.	20022.	0.	0.61	0.52
AWP	037	HAIGH FIELD	ORLAND	CA	54494.	22573.	0.	0.59	0.51
AWP	APV	APPLE VALLEY	APPLE VALLEY	CA	58417.	19068.	0.	0.61	0.51
AWP	KIC	MESA DEL REY	KING CITY	CA	41960.	34898.	0.	0.52	0.51
AWP	L69	EL MIRAGE FLD	ADELANTO	CA	55390.	18083.	0.	0.58	0.49
AWP	L01	CRYSTAL	LLANO	CA	54309.	17729.	0.	0.55	0.48
AWP	031	HEALDSBURG MUNI	HEALDSBURG	CA	52796.	19927.	0.	0.54	0.48
AWP	201	GANSNER FIELD	QUINCY	CA	21056.	50333.	0.	0.38	0.47
AWP	DAG	BARSTOW-DAGGETT	DAGGETT	CA	51734.	16200.	11.	1.77	0.45
AWP	2Q1	GREEN ACRES	VISALIA	CA	17664.	47571.	0.	0.33	0.43
AWP	CA35	SMITH RANCH	SAN RAFAEL	CA	49264.	16077.	0.	0.49	0.43
AWP	Q49	FIREBAUGH	FIREBAUGH	CA	46016.	15017.	0.	0.46	0.41

AWP	059	CEDARVILLE	CEDARVILLE	CA	9840.	51495.	0.	0.29	0.41
AWP	023	RANCHAERO	CHICO	CA	25586.	35155.	0.	0.35	0.40
AWP	Q31	SEQUOIA FIELD	DINUBA	CA	44483.	14521.	0.	0.47	0.39
AWP	L00	ROSAMOND	ROSAMOND	CA	44492.	14526.	0.	0.45	0.39
AWP	060	CLOVERDALE MUNI	CLOVERDALE	CA	35693.	21295.	0.	0.41	0.38
AWP	Q96	NATOMAS FLD	SACRAMENTO	CA	43447.	14183.	0.	0.44	0.38
AWP	TNP	TWENTYNINE PALMS	TWENTYNINE PALMS	CA	41960.	13695.	0.	0.44	0.37
AWP	L06	DEATH VALLEY	DEATH VALLEY NATL MONU	CA	32061.	21708.	0.	0.37	0.36
AWP	020	KINGDON AIRPARK	LODI	CA	40420.	13192.	0.	0.40	0.36
AWP	002	BECKWOURTH	BECKWOURTH	CA	28239.	26115.	0.	0.36	0.36
AWP	0Q7	RANCHO MURIETA	RANCHO MURIETA	CA	40838.	13326.	0.	0.41	0.36
AWP	026	LONE PINE	LONE PINE	CA	14837.	38582.	0.	0.27	0.35
AWP	004	CORNING MUNI	CORNING	CA	28368.	23721.	0.	0.35	0.35
AWP	203	ANGWIN	ANGWIN	CA	36649.	13086.	0.	0.39	0.33
AWP	046	WEED	WEED	CA	28644.	20594.	0.	0.34	0.33
AWP	015	TURLOCK MUNI	TURLOCK	CA	36702.	11979.	0.	0.38	0.32
AWP	L84	LOST HILLS-KERN COUNTY	LOST HILLS	CA	36592.	11946.	0.	0.38	0.32
AWP	Q38	DOS PALOS	DOS PALOS	CA	34714.	11333.	0.	0.35	0.31
AWP	016	GARBERVILLE	GARBERVILLE	CA	33569.	10956.	0.	0.35	0.30
AWP	CA06	SCOTT VALLEY	FORT JONES	CA	17851.	25133.	0.	0.26	0.29
AWP	068	MARIPOSA-YOSEMITE	MARIPOSA	CA	25737.	14231.	0.	0.29	0.27
AWP	L94	FANTASY HAVEN	TEHACHAPI	CA	30095.	9825.	0.	0.30	0.27
AWP	MIT	SHAFTER-KERN COUNTY	SHAFTER	CA	29318.	9570.	0.	0.31	0.26
AWP	301	GUSTINE	GUSTINE	CA	29375.	9588.	0.	0.31	0.26
AWP	Q61	GEORGETOWN	GEORGETOWN	CA	28723.	9974.	0.	0.30	0.26
AWP	028	ELLS FIELD-WILLITS MUNI	WILLITS	CA	29934.	9769.	0.	0.31	0.26
AWP	032	GREAT WESTERN	REEDLEY	CA	28815.	9405.	0.	0.30	0.25
AWP	Q93	ENTERPRISE SKYPARK	REDDING	CA	28219.	9212.	0.	0.28	0.25
AWP	L05	KERN VALLEY	KERNVILLE	CA	20477.	16329.	0.	0.25	0.24
AWP	365	HAPPY CAMP	HAPPY CAMP	CA	14718.	19266.	0.	0.21	0.23
AWP	010	ALTA	DINUBA	CA	26201.	8551.	0.	0.26	0.23
AWP	036	TRINITY CENTER	TRINITY CENTER	CA	24675.	8053.	0.	0.26	0.22
AWP	Q72	HAYFORK	HAYFORK	CA	7358.	23771.	0.	0.15	0.21
AWP	L80	HI DESERT	JOSHUA TREE	CA	23476.	7662.	0.	0.23	0.21
AWP	Q40	SUNSET SKYRANCH	ELK GROVE	CA	23458.	7656.	0.	0.23	0.21
AWP	L72	TRONA	TRONA	CA	23553.	7689.	0.	0.25	0.21
AWP	014	TURLOCK AIRPARK	TURLOCK	CA	23568.	7691.	0.	0.23	0.21
AWP	Q84	MENDOTA	MENDOTA	CA	22548.	7359.	0.	0.24	0.20
AWP	Q88	PARADISE SKYPARK	PARADISE	CA	10999.	18053.	0.	0.17	0.19
AWP	L22	YUCCA VALLEY	YUCCA VALLEY	CA	22061.	7200.	0.	0.23	0.19
AWP	L19	WASCO-KERN COUNTY	WASCO	CA	21219.	6926.	0.	0.21	0.19
AWP	029	PATTERSON	PATTERSON	CA	21724.	7092.	0.	0.22	0.19
AWP	CLR	CALIPATRIA MUNI	CALIPATRIA	CA	20112.	6566.	0.	0.21	0.18
AWP	097	RICHVALE	RICHVALE	CA	20715.	6761.	0.	0.21	0.18
AWP	033	EUREKA MUNI	EUREKA	CA	16786.	5479.	0.	0.18	0.15
AWP	CRO	CORCORAN	CORCORAN	CA	17033.	5561.	0.	0.18	0.15
AWP	009	ROUND VALLEY	COVELO	CA	16786.	5479.	0.	0.18	0.15
AWP	081	TULELAKE MUNI	TULELAKE	CA	15160.	5981.	0.	0.16	0.14
AWP	0Q5	SHELTER COVE	SHELTER COVE	CA	14131.	5167.	0.	0.14	0.13
AWP	0Q9	SONOMA SKYPARK	SONOMA	CA	15229.	4971.	0.	0.15	0.13
AWP	Q80	LODI AIRPARK	LODI	CA	13146.	4292.	0.	0.13	0.12
AWP	L68	LAKE WOHLFORD RESORT	ESCONDIDO	CA	11784.	3845.	0.	0.12	0.10
AWP	L26	HESPERIA AIR LODGE	HESPERIA	CA	10460.	3415.	0.	0.11	0.09
AWP	L18	FALLBROOK COMMUNITY AIRPARK	FALLBROOK	CA	9460.	4309.	0.	0.10	0.09
AWP	L02	SANTA SUSANA	SIMI VALLEY	CA	8858.	2892.	0.	0.09	0.08
AWP	Q97	JENSEN FIELD	SACRAMENTO	CA	8667.	2830.	0.	0.09	0.08
AWP	L17	TAFT-KERN COUNTY	TAFT	CA	9238.	3016.	0.	0.09	0.08
AWP	RZH	QUARTZ HILL	QUARTZ HILL	CA	8146.	2660.	0.	0.09	0.07
AWP	1Q1	ECKERT FIELD	STRATHMORE	CA	7603.	2482.	0.	0.08	0.07
AWP	Q21	BROWNSVILLE	BROWNSVILLE	CA	7328.	2392.	0.	0.08	0.06

AWP	074	REDDING SKY RANCH	REDDING	CA	4446.	3864.	0.	0.06	0.06
AWP	L93	VALLEY VIEW AIRPARK	RIDGECREST	CA	5179.	1690.	0.	0.05	0.05
AWP	Q17	BOONVILLE	BOONVILLE	CA	4099.	1338.	0.	0.04	0.04
AWP	Q82	ALPINE COUNTY	MARKLEEVILLE	CA	4103.	1339.	0.	0.04	0.04
AWP	Q69	OCEAN RIDGE	GUALALA	CA	3287.	2362.	0.	0.04	0.04
AWP	L53	SUN HILL RANCH	ADELANTO-HELENDL-SLVR LKS	CA	1224.	399.	0.	0.01	0.01
AWP	062	CARMEL VALLEY	CARMEL VALLEY	CA	1310.	428.	0.	0.01	0.01
AWP	Q92	RED FLAT AIR STRIP	RED BLUFF	CA	549.	179.	0.	0.01	0.00
AWP	NPS	FORD ISLAND ALF	HONOLULU	HI	299630.	97828.	0.	2.98	2.64
AWP	HDH	DILLINGHAM AIRFIELD	MOKULEIA	HI	289109.	94364.	0.	2.98	2.55
AWP	LNY	LANAI	LANAI CITY	HI	21697.	112443.	0.	0.73	0.89
AWP	HNM	HANA	HANA	HI	4161.	106721.	0.	0.55	0.74
AWP	MUE	WAIMEA-KOHALA	KAMUELA	HI	939.	105670.	0.	0.52	0.71
AWP	LUP	KALAUPAPA	KALAUPAPA	HI	1425.	105828.	0.	0.52	0.71
AWP	HKP	KAANAPALI	LAHAINA	HI	399.	105494.	0.	0.51	0.70
AWP	UPP	UPOLU	HAWI	HI	622.	98348.	0.	0.40	0.66
AWP	JON	JOHNSTON ATOLL	JOHNSTON ISLAND	HI	0.	21043.	0.	0.09	0.14
AWP	PAK	PORT ALLEN	HANAPEPE	HI	2546.	831.	0.	0.03	0.02
AWP	EKO	ELKO MUNI-J.C. HARRIS FIELD	ELKO	NV	625643.	211516.	605.	4.60*	5.56*
AWP	TPH	TONOPAH	TONOPAH	NV	155311.	131175.	151.	1.50*	1.90*
AWP	L15	LAS VEGAS-HENDERSON SKY HARBOR	LAS VEGAS	NV	200116.	75794.	0.	2.00	1.83
AWP	004	CARSON	CARSON CITY	NV	163381.	83721.	0.	1.71	1.64
AWP	WMC	WINNEMUCCA MUNI	WINNEMUCCA	NV	49496.	121519.	0.	2.00	1.14
AWP	4SD	RENO/STEAD	RENO	NV	106267.	54906.	0.	1.14	1.07
AWP	MEV	DOUGLAS COUNTY	MINDEN	NV	99282.	57696.	0.	1.07	1.04
AWP	BLD	BOULDER CITY MUNI	BOULDER CITY	NV	39398.	116672.	0.	0.84	1.04
AWP	LWL	HARRIET FIELD	WELLS	NV	75773.	43232.	73.	0.62*	0.79*
AWP	LOL	DERBY FIELD	LOVELOCK	NV	26019.	84242.	0.	0.53	0.73
AWP	BAM	LANDER COUNTY	BATTLE MOUNTAIN	NV	36020.	70555.	12.	0.47	0.71
AWP	HTH	HAWTHORNE MUNI	HAWTHORNE	NV	17114.	81479.	0.	0.44	0.66
AWP	FLX	FALLON MUNI	FALLON	NV	29300.	60236.	0.	0.47	0.59
AWP	043	YERINGTON MUNI	YERINGTON	NV	26373.	59278.	0.	0.44	0.57
AWP	05U	EUREKA	EUREKA	NV	8089.	68468.	0.	0.32	0.51
AWP	9U3	AUSTIN	AUSTIN	NV	2778.	28822.	0.	0.13	0.21
AWP	U08	OVERTON MUNI	OVERTON	NV	5522.	6956.	0.	0.07	0.08
AWP	BTY	BEATTY	BEATTY	NV	1926.	5579.	0.	0.04	0.05
AWP	0L9	ECHO BAY	OVERTON	NV	1410.	3137.	0.	0.02	0.03
AWP	10U	OWYHEE	OWYHEE	NV	113.	596.	0.	0.00	0.00
AWP	GSN	SAIPAN INTERNATIONAL	OBYAN	SP	1025.	105698.	0.	0.52	0.71
AWP	PPG	PAGO PAGO INTL	PAGO PAGO	SP	1607.	105888.	0.	0.52	0.71
AWP	TNI	WEST TINIAN	PEIPEINIMARU	SP	9.	105366.	0.	0.51	0.70
AWP	GRO	ROTA INTL	ROTA ISLAND	SP	18.	105369.	0.	0.51	0.70
AWP	PNI	PONAPE INTL	PONAPE ISLAND	SP	2065.	54862.	0.	0.21	0.38
AWP	YAP	YAP	YAP ISLAND	SP	2711.	51459.	0.	0.27	0.36
AWP	ROR	BABELTHAUP/KOROR	BABELTHUAP ISLAND	SP	895.	53725.	0.	0.19	0.36
AWP	Z07	TRUK INTL	MOEN ISLAND	SP	55.	36183.	0.	0.13	0.24
AWP	MAJ	MARSHALL ISLANDS INTL	MAJURO ATOLL	SP	322.	33687.	0.	0.15	0.23
AWP	Z08	OFU	OFU VILLAGE	SP	0.	26732.	0.	0.09	0.18

BENEFIT/COST RATIO BEFORE PROXIMITY PENALTY OR REMOTENESS PREMIUM, IF ANY.

* AIRPORTS WITH INSTRUMENT APPROACH PROCEDURES FOR WHICH GENERAL AVIATION AND MILITARY ANNUAL INSTRUMENT APPROACHES (AIA'S) WERE COMPUTED WITH THE SCI MODEL USING NATIONAL NORMS FOR PIFR (13.5%) AND PC (4.95%) ARE IDENTIFIED BY '*'. FOR OTHER AIRPORTS WITH INSTRUMENT APPROACH PROCEDURES, AIA'S WERE COMPUTED WITH THE SCI MODEL USING VALUES FOR PIFR AND PC BASED ON SITE-SPECIFIC MINIMA IN THE SCI FILE. FOR AIRPORTS WITHOUT RECORDED AIA'S IN THE TAF, THE SCI MODEL USED TO PREDICT AIA'S WAS SUPPRESSED.

RECAP - FIGURE 34-A

Region	State	Less than .50	.50 to .99	1.00 to 1.49	1.50 to 1.99	2.00 or Greater	Total
		Number of Sites With Phase II Benefit/Cost Ratios of					
AAL	AK	114	79	8	4	5	210
ACE	IA	40	18	16	7	17	98
	KS	40	13	4	6	13	76
	MO	45	17	9	3	16	90
	NE	41	11	1	1	9	63
		166	59	30	17	55	327
AEA	DE	4	1	1	0	3	9
	MD	7	7	3	2	11	30
	NJ	13	11	4	3	15	46
	NY	46	11	8	9	18	92
	PA	62	16	7	6	25	116
	VA	23	9	8	6	7	53
	WV	14	4	1	0	3	22
		169	59	32	26	82	368
AGL	IL	32	11	7	6	27	83
	IN	34	15	9	6	24	88
	MI	51	11	8	9	33	112
	MN	57	7	7	6	19	96
	ND	36	0	1	1	2	40
	OH	59	26	18	12	28	143
	SD	33	1	0	0	6	40
	WI	45	16	8	5	23	97
		347	87	58	45	162	699
ANE	CT	4	2	2	1	3	12
	MA	12	3	1	5	9	30
	ME	14	2	4	5	7	32
	NH	4	2	0	1	5	12
	RI	1	0	3	0	2	6
	VT	5	3	2	0	1	11
		40	12	12	12	27	103

Region	State	Less than .50	.50 to .99	1.00 to 1.49	1.50 to 1.99	2.00 or Greater	Total
ANM	CO	29	12	3	3	12	59
	ID	27	5	5	2	1	40
	MT	38	4	3	2	3	50
	OR	31	9	6	4	12	62
	UT	17	11	6	3	2	39
	WA	55	12	4	4	13	88
	WY	10	8	4	0	8	30
		207	61	31	18	51	368
ASO	AL	31	9	1	4	[illegible]	60
	FL	22	7	11	6	23	69
	GA	52	14	7	7	6	86
	KY	24	7	2	2	6	41
	MS	33	7	4	1	12	57
	NL	26	9	5	4	14	58
	PR	1	3	0	1	0	5
	SC	13	10	8	1	6	38
	TN	25	23	7	1	6	62
		227	89	45	27	88	476
ASW	AR	19	10	13	4	12	58
	LA	27	4	4	5	4	44
	NM	23	4	3	4	4	38
	OK	45	13	9	3	16	[illegible]
	TX	154	39	13	9	38	[illegible]
		268	70	42	25	74	479
AWP	AZ	24	15	6	4	6	55
	CA	76	41	22	14	33	[illegible]
	HI	2	6	0	0	2	[illegible]
	NV	5	7	4	3	1	20
	SP	6	4	0	0	0	10
		113	73	32	21	42	281
GRAND TOTAL		1,651	589	290	195	586	3,311

1,071 (1.00 to 1.49 + 1.50 to 1.99 + 2.00 or Greater)

FIGURE 34-B

RESULTS OF APPLYING AWOS CRITERIA FOR NON-TOWERED AIRPORTS TO TENTATIVELY-IDENTIFIED ATCT DISCONTINUANCE CANDIDATES ##

LOCID	AIRPORT NAME	CITY	ST	LC SAFETY BENS	LC EFFICY BENS	GA+ML AIA'S YR 1	PHASE I B/C#	PHASE II B/C#
ADM	ARDMORE MUNI	ARDMORE	OK	758371.	133080.	556.	3.33	5.92
AKR	AKRON FULTON INTERNATIONAL	AKRON	OH	894317.	155667.	764.	5.28	6.93
ALW	WALLA WALLA CITY COUNTY	WALLA WALLA	WA	969458.	268311.	741.	5.23	8.22
AWM	WEST MEMPHIS MUNI	WEST MEMPHIS	AR	870401.	150900.	690.	4.60	6.79
BEH	ROSS FIELD	BENTON HARBOR	MI	454976.	171286.	357.	2.78	4.16
BMG	MONROE COUNTY	BLOOMINGTON	IN	197102.	155152.	698.	5.22	2.34
CGI	CAPE GIRARDEAU MUNI	CAPE GIRARDEAU	MO	735777.	230695.	613.	4.55	6.42
CGX	MERRILL C MEIGS	CHICAGO	IL	177269.	162590.	0.	2.36	2.26
CIC	CHICO MUNI	CHICO	CA	1048300.	283375.	902.	6.31	8.85
CKB	BENEDUM	CLARKSBURG	WV	727561.	229499.	659.	4.59	6.36
CRE	GRAND STRAND	NORTH MYRTLE BEACH	SC	1151664.	271688.	838.	6.36	9.46
CSM	CLINTON-SHERMAN	CLINTON	OK	353282.	83437.	352.	2.09	2.90
DBQ	DUBUQUE MUNI	DUBUQUE	IA	970361.	269761.	861.	6.06	8.24
DKX	KNOXVILLE DOWNTOWN ISLAND	KNOXVILLE	TN	918902.	164780.	692.	4.89	7.20
DNV	VERMILION COUNTY	DANVILLE	IL	405923.	174191.	341.	2.79	3.85
ESF	ESLER REGIONAL	ALEXANDRIA	LA	556003.	197194.	478.	3.57	5.00
EWN	SIMMONS NOTT	NEW BERN	NC	487996.	191669.	375.	3.00	4.52
FCH	FRESNO-CHANDLER DOWNTOWN	FRESNO	CA	990545.	271524.	743.	5.83	8.39
FLO	FLORENCE CITY-COUNTY	FLORENCE	SC	790317.	237298.	650.	4.18	6.83
GBG	GALESBURG MUNI	GALESBURG	IL	566238.	200551.	504.	3.78	5.09
HKY	HICKORY MUNI	HICKORY	NC	661797.	216508.	551.	4.12	5.84
HLG	WHEELING OHIO CO	WHEELING	WV	699725.	214815.	478.	3.33	6.08
HOB	LEA COUNTY/HOBBS/	HOBBS	NM	505771.	189994.	472.	4.09	4.62
HOT	MEMORIAL FIELD	HOT SPRINGS	AR	774110.	235475.	543.	4.38	6.71
IDA	FANNING FIELD	IDAHO FALLS	ID	619977.	209414.	573.	4.08	5.51
ISO	EASTERN RGNL JETPORT AT STALLINGS FLD	KINSTON	NC	579932.	201877.	580.	3.78	5.19
LEB	LEBANON REGIONAL	LEBANON	NH	588202.	205464.	521.	3.77	5.27
LRD	LAREDO INTERNATIONAL	LAREDO	TX	769474.	236046.	648.	5.10	6.68
LWB	GREENBRIER VALLEY	LEWISBURG	WV	292801.	154220.	236.	2.09	2.97
MAZ	MAYAGUEZ AIRFIELD	MAYAGUEZ	PR	207532.	139680.	142.	0.69	2.31
MGW	MORGANTOWN MUNI-WALTER L. BILL HART FLD	MORGANTOWN	WV	719720.	226662.	694.	4.89	6.29
MOT	MINOT INTL	MINOT	ND	665622.	214999.	552.	3.99	5.85
MVY	MARTHAS VINEYARD	MARTHAS VINEYARD	MA	545746.	195888.	416.	3.63	4.93
MWA	WILLIAMSON COUNTY	MARION	IL	826841.	247738.	669.	4.79	7.14
MYV	YUBA COUNTY	MARYSVILLE	CA	1033805.	253318.	911.	6.65	8.55
OWB	OWENSBORO-DAVIESS COUNTY	OWENSBORO	KY	767315.	234754.	680.	5.18	6.66
PAH	BARKLEY REGIONAL	PADUCAH	KY	482785.	185554.	387.	2.96	4.44
PBF	GRIDER FIELD	PINE BLUFF	AR	635914.	176968.	602.	4.67	5.40
PSE	MERCEDITA	PONCE	PR	209297.	137780.	148.	1.24	2.31
PVW	HALE COUNTY	PLAINVIEW	TX	984155.	164955.	746.	3.21	7.64
SAF	SANTA FE COUNTY MUNI	SANTA FE	NM	956932.	261370.	835.	6.03	8.09
SPA	SPARTANBURG DOWNTOWN MEMORIAL	SPARTANBURG	SC	859682.	249829.	627.	4.91	7.37
SSI	MALCOLM MCKINNON	BRUNSWICK	GA	355961.	63246.	231.	2.19	2.79
STJ	ROSECRANS MEMORIAL	ST JOSEPH	MO	848617.	180073.	640.	3.10	6.83

TNT	DADE-COLLIER TRAINING AND TRANSITION	MIAMI	FL	210605.	38641.	129.	0.96	1.66
TUT	PAGO PAGO INTL	PAGO PAGO	SP	21813.	108600.	61.	0.68	0.87
TXK	TEXARKANA MUNI-WEBB FLD	TEXARKANA	AR	728486.	227537.	743.	5.25	6.35
VDZ	VALDEZ NR 2	VALDEZ	AK	88810.	120234.	63.	0.85	1.39
VLD	VALDOSTA MUNI	VALDOSTA	GA	678770.	217985.	525.	4.16	5.96
WDG	ENID WOODRING MUNI	ENID	OK	892061.	252850.	838.	6.20	7.61

RECAP

TOTAL LOCATIONS HAVING PHASE II BENEFIT/COST RATIOS OF LESS THAN .50	0.
TOTAL LOCATIONS HAVING PHASE II BENEFIT/COST RATIOS FROM .50 TO .99	1.
TOTAL LOCATIONS HAVING PHASE II BENEFIT/COST RATIOS FROM 1.00 TO 1.49	1.
TOTAL LOCATIONS HAVING PHASE II BENEFIT/COST RATIOS FROM 1.50 TO 1.99	1.
TOTAL LOCATIONS HAVING PHASE II BENEFIT/COST RATIOS OF 2.00 OR GREATER	47.
TOTAL LOCATIONS	50.

BENEFIT/COST RATIO BEFORE PROXIMITY PENALTY OR REMOTENESS PREMIUM, IF ANY.

THE FOLLOWING LOCATIONS ARE EXCLUDED FROM THIS LIST BECAUSE THE NATIONAL WEATHER SERVICE IS CURRENTLY RESPONSIBLE FOR THE WEATHER OBSERVATION FUNCTION: ACT, AHN, MCN AND PDT.

CHAPTER VII - SENSITIVITY ANALYSIS

A. Introduction

In the cost-effectiveness analysis of AWOS at FAA towered airports (described in Section B of Chapter IV) and the benefit/cost analysis of AWOS at non-towered and non-federal towered airports (described in Section C of Chapter IV), there are a number of constants and variables which are used to quantify benefits and costs. While some of these parameters are known with relative certainty, others are uncertain and may be characterized by judgment. This chapter addresses the sensitivity of the results of these analyses to variations in those parameters which appear to be the most significant or sensitive.

B. FAA Towered Airports

FAA towered airports where the surface weather observation function is the responsibility of the FAA automatically qualify for AWOS establishment, except locations identified as ATCT discontinuance candidates. This policy rests on the fact that weather observations are required by regulation in control zones and the life-cycle cost of AWOS at such locations is less than those of acceptable manual weather observation system alternatives. Priority of AWOS establishment at these locations will be given to part-time facilities, followed by full-time facilities, in recognition of the relatively greater benefits of AWOS when facilities are closed.

Because the unit costs used to develop the life-cycle costs of AWOS in this report are preliminary estimates, it is important that a sensitivity analysis be conducted to support the policy of automatic qualification for AWOS at these airports. This sensitivity analysis was approached by asking the question: "What would happen to the life-cycle costs of AWOS if the investment and annually recurring operations and maintenance costs were more than anticipated?" Assuming as much as a 50 percent increase in investment cost and a 200 percent increase in annual recurring costs of AWOS, a life-cycle cost of $365,472 results, a value still approximately 44 percent less than other acceptable options of collecting and disseminating weather data at locations with an active FAA ATCT. Even after ignoring the costs and alleged cost savings of observation personnel in light of the arguments outlined in Chapter IV and applying the same variations, the life-cycle cost of AWOS is still approximately 20 percent less than the acceptable manual options.

C. Non-Towered and Non-Federal Airports

In the case of the benefit/cost analysis for establishment of AWOS at non-towered and non-federal towered airports, the sensitivity of the following parameters were examined: probability of weather below VFR minima, probability of weather below IFR minima, number of projected annual general aviation instrument approaches, probability of a ceiling/visibility-related accident, probability of a wind-related accident, annual benefit to existing commercial weather observation service (SAWRS) operation, probability of averting an instrument flight disruption, life-cycle cost, and the value of a statistical life. The results of introducing specific percentage increases and decreases to each of these parameters, while holding all other parameters constant, for a sample of selected airports with Phase II benefit/cost ratios of .80 (LNL), .90 (SJN), 1.00 (SMN), 1.10 (GTR) and 1.20 (BGD) are outlined below in Figure 35. Additionally, Figure 35 outlines the aggregate number of qualifying non-towered and non-federal towered airports corresponding to each parameter variation.

FIGURE 35

Sensitivity Analysis

	Airport With B/C Ratio Of: .80	.90	1.00*	1.10*	1.20	Total Number of Qualifying Non-Towered/Non-Federal Towered Civil Airports (B/C = 1.0 or more)	
Life-Cycle Cost							
50% decrease	1.61	1.80	2.01	2.20	2.39	1,638	(+53%)
20% decrease	1.00	1.12	1.26	1.38	1.50	1,239	(+16%)
10% decrease	.89	1.00	1.12	1.22	1.33	1,147	(+ 7%)
No Change ($150,505)	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.73	.82	.91	1.00	1.09	989	(- 8%)
20% increase	.67	.75	.84	.92	1.00	914	(-15%)
50% increase	.54	.60	.67	.73	.80	768	(-28%)
Annual Benefit to Air Carrier and Air Taxi User Classes							
50% decrease	.77	.62	.65	.75	.93	954	(-11%)
20% decrease	.79	.79	.86	.96	1.09	1,013	(- 5%)
10% decrease	.80	.84	.93	1.03	1.14	1,036	(- 3%)
No Change	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.81	.95	1.07	1.17	1.25	1,084	(+ 1%)
20% increase	.82	1.01	1.14	1.24	1.30	1,115	(+ 4%)
50% increase	.84	1.17	1.35	1.45	1.46	1,207	(+13%)
Probability of Weather Below VFR Minima							
50% decrease	**	.80	1.00	1.10	1.08	319	(-70%)
20% decrease	.17	.86	1.00	1.10	1.15	580	(-46%)
10% decrease	.38	.88	1.00	1.10	1.17	781	(-27%)
No Change	.80	.90	1.00	1.10	1.20	1,071	
10% increase	1.71	.92	1.00	1.10	1.22	1,346	(+26%)
20% increase	3.80	.94	1.00	1.10	1.24	1,426	(+33%)
50% increase	46.21	1.00	1.00	1.10	1.31	1,468	(+37%)
Value of a Statistical Life							
50% decrease	.54	.81	.95	1.03	1.05	897	(-16%)
20% decrease	.70	.86	.98	1.07	1.14	995	(- 7%)
10% decrease	.75	.88	.99	1.09	1.17	1,034	(- 3%)
No Change ($580,000)	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.86	.92	1.00	1.11	1.23	1,090	(+ 2%)
20% increase	.91	.93	1.03	1.13	1.26	1,112	(+ 4%)
50% increase	1.07	.99	1.06	1.17	1.35	1,193	(+11%)

	Airport With B/C Ratio Of: .80	.90	1.00*	1.10*	1.20	Total Number of Qualifying Non-Towered/Non-Federal Towered Civil Airports (B/C = 1.0 or more)	
No. of Projected Annual GA Instrument Approaches							
50% decrease	.50	.83	1.00	1.10	1.13	928	(-13%)
20% decrease	.68	.87	1.00	1.10	1.17	1,007	(- 6%)
10% decrease	.74	.88	1.00	1.10	1.18	1,031	(- 4%)
No Change	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.86	.91	1.00	1.10	1.21	1,079	(+ 1%)
20% increase	.92	.92	1.00	1.10	1.22	1,093	(+ 2%)
50% increase	1.10	.96	1.00	1.10	1.26	1,134	(+ 6%)
Probability of Averting a GA Wind-Related Accident							
50% decrease	.75	.82	.89	.95	1.00	914	(-15%)
20% decrease	.78	.87	.96	1.04	1.12	1,015	(- 5%)
10% decrease	.79	.88	.98	1.07	1.16	1,034	(- 3%)
No Change (3.704×10^{-6} per GAITN or MILITN)	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.81	.91	1.03	1.13	1.24	1,082	(+ 1%)
20% increase	.82	.93	1.05	1.16	1.28	1,113	(+ 4%)
50% increase	.85	.98	1.11	1.25	1.40	1,183	(+10%)
Probability of Averting a GA Ceiling/Visibility-Related Accident							
50% decrease	.54	.84	1.00	1.10	1.14	950	(-11%)
20% decrease	.70	.88	1.00	1.10	1.17	1,018	(- 5%)
10% decrease	.75	.89	1.00	1.00	1.19	1,034	(- 3%)
No Change (1.387×10^{-6} per GAITN or MLITN)	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.86	.91	1.00	1.10	1.21	1,077	(+ 1%)
20% increase	.91	.92	1.00	1.10	1.22	1,091	(+ 2%)
50% increase	1.07	.95	1.00	1.10	1.25	1,130	(+ 6%)
Probability of Weather Below IFR Minima							
50% decrease	1.15	.93	1.00	1.10	1.25	1,278	(+19%)
20% decrease	1.05	.91	1.00	1.10	1.22	1,245	(+16%)
10% decrease	.97	.90	1.00	1.10	1.21	1,205	(+13%)
No Change	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.44	.89	1.00	1.10	1.19	825	(-23%)
20% increase	**	.88	1.00	1.10	1.18	394	(-63%)
50% increase	**	.86	1.00	1.10	1.15	214	(-80%)

	Airport With B/C Ratio Of:					Total Number of Qualifying Non-Towered/Non-Federal Towered Civil Airports (B/C = 1.0 or more)	
	.80	.90	1.00*	1.10*	1.20		
Probability of Averting an Instrument Flight Disruption							
50% decrease	.77	.89	1.00	1.10	1.19	1,044	(- 3%)
20% decrease	.79	.89	1.00	1.10	1.19	1,051	(- 2%)
10% decrease	.80	.90	1.00	1.10	1.20	1,054	(- 2%)
No Change (.10)	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.81	.90	1.00	1.10	1.20	1,072	(0%)
20% increase	.82	.90	1.00	1.10	1.20	1,077	(+ 1%)
50% increase	.84	.91	1.00	1.10	1.21	1,088	(+ 2%)
Proximity Penalty and Remoteness Premium (Applied to All Sites)							
Proximity Penalty (50%)	.40	.45	.50	.55	.60	569	(-47%)
No Penalty/Premium	.80	.90	1.00	1.10	1.20	1,071	
Remoteness Premium (25%)	1.00	1.12	1.26	1.38	1.50	1,239	(+16%)
Annual Aircraft Operations							
50% decrease	.75	.79	.95	1.08	1.07	1,001	(- 7%)
20% decrease	.78	.86	1.00	1.09	1.15	1,040	(- 3%)
10% decrease	.79	.88	1.00	1.10	1.17	1,047	(- 2%)
No Change	.80	.90	1.00	1.10	1.20	1,071	
10% increase	.81	.92	1.01	1.11	1.22	1,084	(+ 1%)
20% increase	.82	.94	1.01	1.11	1.25	1,094	(+ 2%)
50% increase	.86	1.00	1.02	1.12	1.32	1,128	(+ 5%)

* SMN and GTR do not have approved instrument approach procedures. This fact explains why their benefit/cost ratios do not change with variations in certain parameters.

** Negative or nonsensical results produced because interrelationship between PIFR and PC in the SCI regression model used to predict number of annual instrument approaches.

CHAPTER VIII - IMPACT ANALYSIS

It is impossible, at least with a high degree of accuracy, to assess the impact of the criteria on agency resources as required by Order 1320.1 because (1) it is presently uncertain which specific AWOS configuration will be justified for each qualifying airport (i.e., differing requirements for various airports may result in implementation of various AWOS sensor configurations), and (2) meeting candidacy levels will not mean automatic qualification since benefit/cost screening is but one of several inputs to the FAA decisionmaking process relative to investment in facilities and equipment. Aside from these uncertainties, this impact analysis is based on installations of AWOS with sensors for wind, temperature, dew point, altimeter setting, ceiling, visibility and liquid precipitation. While this is the typical AWOS configurations envisioned by the AWOS Program Office as of the date of this report, future configurations may include additional or fewer sensors. For example, a cloud height (ceiling) sensor may not be justified at certain locations in close proximity to another observation site, while additional sensors, such as for freezing precipitation and thunderstorms, may be added if cost effective.

Based on these assumptions, extrapolations of the Terminal Area Forecasts and ignoring the impact of any proximity penalties or remoteness premimums as provided for in Chapter IV-C-4, Figure 34-A shows 1,071 non-towered and non-federal towered airports locations with benefit/cost ratios of 1.0 or greater. All FAA towered airports where the surface weather observation function is the responsibility of the FAA, other than tower discontinuance candidates, or approximately 254 airports, automatically qualify for AWOS. Priority of AWOS establishment at FAA towered airports will be given to part-time facilities, followed by full-time facilities, in recognition of the relatively greater benefits of AWOS when facilities are closed. Figure 34-B shows 49 of 50 tentatively-identified FAA ATCT discontinuance candidates with benefit/cost ratios of 1.0 or more. Applying average respective life-cycle costs of approximately $165,300 and $150,500 to 254 towered and 1,120 non-towered, non-federal towered, and ATCT discontinuance candidate locations results in approximately $210.5 million (1981 dollars). Approximately 60 percent of the investment is incurred for facilities and equipment in the acquisition year. The remainder represents discounted operations and maintenance costs over an estimated 15 year economic life. These impact assessments may be understated after allowing for remoteness premiums and may be overstated after allowing for proximity penalties.

APPENDIX A-1

Statistical Summary of Accident Briefs-Weather Observation Unavailable[1]

(Calendar Year 1979; Approach or Landing Phases of Operation)

"Modified" Cause/ Factor[2]	NTSB File No.	No. of Injuries: Fatal	Serious	Minor	None	Degree of Aircraft Damage: Destroyed	Substantial	Minor	No
Unfavorable Winds or Wrong Runway	0008				1		X		
	0069				2		X		
	0117				1		X		
	0128				1		X		
	0134				1		X		
	0154				3		X		
	0176				2		X		
	0204				1		X		
	0205				1		X		
	0228				2		X		
	0251				4		X		
	0259				1		X		
	0267				2		X		
	0300				1		X		
	0334				1		X		
	0335				2		X		
	0336				2		X		
	0341				3		X		
	0350				2		X		
	0423				1		X		
	0458				2		X		
	0464				1		X		
	0495				1		X		
	0590	2				X			
	0633				1		X		
	0669				2		X		
	0685				1		X		
	0711				1		X		
	0718			2			X		
	0721				1		X		
	0725				1		X		
	0753				3		X		
	0762				1		X		
	0784				1		X		
	0813				3		X		
	0831				2		X		
	0845				1		X		
	0860				3		X		
	0905		1	4			X		
	0918				1		X		
	0921				2		X		
	0937		1		2				
	0972				1		X		
	0996				4		X		
	1008				1		X		

"Modified" Cause/ Factor[2/]	NTSB File No.	No. of Injuries				Degree of Aircraft Damage			
		Fatal	Ser-ious	Minor	None	Destroyed	Substantial	Minor	None
Unfavorable	1009				3		X		
Winds or	1013				2		X		
Wrong Runway	1015				1		X		
(Cont'd.)	1016				1		X		
	1028				1		X		
	1042	2				X			
	1046	1	1			X			
	1103				1		X		
	1142				1		X		
	1161				1		X		
	1183				1		X		
	1185				1		X		
	1233			2		X			
	1252		1				X		
	1339				1		X		
	1363				1		X		
	1365				2		X		
	1375				2		X		
	1416				1		X		
	1443				4		X		
	1450				2		X		
	1473			4			X		
	1483			1	2		X		
	1574				2		X		
	1624				1		X		
	1636				2		X		
	1637				1		X		
	1661				1		X		
	1674		1			X			
	1701				1		X		
	1746				2		X		
	1817				4		X		
	1829			1		X			
	1830				2		X		
	1849				1		X		
	1873			4		X			
	1881				1		X		
	1896				1	X			
	1910				1		X		
	1914		2				X		
	1922				2		X		
	1944		1	1			X		
	2006			3	3		X		
	2021				3		X		
	2127			1			X		
	2202				1		X		
	2205			3			X		
	2251				1		X		
	2271				6		X		
	2309				4		X		
	2318				1		X		
	2329				2		X		
	2402				1		X		

APPENDIX A-1 (Continued)

"Modified" Cause/ Factor 2/	NTSB File No.	No. of Injuries: Fatal	Serious	Minor	None	Degree of Aircraft Damage: Destroyed	Substantial	Minor	None
Unfavorable Winds or Wrong Runway (Cont'd)	2412				3		X		
	2440				1		X		
	2457				1		X		
	2514				2		X		
	2537	1				X			
	2561				2		X		
	2598				1		X		
	2632			1	1		X		
	2636				3		X		
	2660				1		X		
	2747				2		X		
	2750				1		X		
	2812			1	2		X		
	2911				1		X		
	2918				2		X		
	3023				3		X		
	3202		1			X			
	3204				1		X		
	3214				2		X		
	3221		1				X		
	3287		2				X		
	3312			1	2		X		
	3314				1	X			
	3315				2		X		
	3385				2		X		
	3397				1		X		
	3408				2		X		
	3489				1		X		
	3494				2	X			
	3505			1		X			
	3527				1		X		
	3548				2		X		
	3555				2	X			
	3578				3		X		
	3687		2				X		
	3711				1		X		
	3731				1		X		
	3771				1		X		
	3775				2		X		
	3868				2		X		
	3939				1		X		
	4016	2	1			X			
Subtotals	140	8	15	30	200	15	124	0	1
Low Ceiling/ Visibility: IFR Approach	0091				2		X		
	0119				5		X		
	0139		1			X			
	0564	1				X			
	0607	4				X			
	0778			2			X		
	0808	4					X		
	0913		4		2	X			
	1086	1				X			
	1951			2	1	X			

APPENDIX A-1 (Continued)

"Modified" Cause/ Factor[2]/	NTSB File No.	No. of Injuries: Fatal	Serious	Minor	None	Degree of Aircraft Damage: Destroyed	Substantial	Minor	None
Low Ceiling/ Visibility: IFR Approach (Cont'd)	2148				4		X		
	2423				4		X		
	2595				5		X		
	3266	3				X			
	3366	4				X			
	3529	1				X			
	3620	2	1			X			
	3712	1				X			
	3858				4		X		
	3905	2				X			
	3988		1				X		
	3989	2				X			
	3993	1				X			
	4006	2				X			
	4010	2	1			X			
Subtotals	25	30	8	4	27	16	9	0	0
Thunderstorms	1700			1	1		X		
	2591				4		X		
Subtotals	2	0	0	1	5	0	2	0	0
Temperature/ Dew Point	1376				4		X		
	1536			2			X		
	1771			2			X		
	3252				2		X		
	3378				1		X		
Subtotals	5	0	0	4	7	0	5	0	0
Rain, Hydroplanning, or Wet Runway	1261		2			X			
	2122				8		X		
	2903				2		X		
	3025				2		X		
Subtotals	4	0	2	0	12	1	3	0	0
Totals	176	38	25	39	251	32	143	0	1

APPENDIX A-2

Statistical Summary of Accident Briefs - Weather Observation Available[1]/

(Calendar Year 1979; Approach or Landing Phases of Operation)

"Modified" Cause/ Factor[2]/	NTSB File No.	No. of Injuries: Fatal	Serious	Minor	None	Degree of Aircraft Damage: Destroyed	Substantial	Minor	N
Unfavorable	0106				1		X		
Winds or	0153				1		X		
Wrong Runway	0165				3		X		
	0212				1		X		
	0269				1		X		
	0343				1		X		
	0383				1		X		
	0386				1		X		
	0490			1	2		X		
	0567				1		X		
	0680				1		X		
	0742				1		X		
	0881				3		X		
	0904				1		X		
	0979			1			X		
	1024				2		X		
	1041			1	1		X		
	1057				1		X		
	1104		1					X	
	1113				4		X		
	1184			3	1		X		
	1211			1			X		
	1341				1		X		
	1364			1	2		X		
	1722				2		X		
	1828			2			X		
	2043				2		X		
	2176				1		X		
	2260			4			X		
	2343				1		X		
	2413			1			X		
	2693		2						
	2804				1		X		
	2808				1		X		
	2855				2		X		
	3311				1		X		
	3455				2		X		
	3566			1	1		X		
	3641				1		X		
	3690				4		X		
Subtotals	40	0	3	17	50	0	38	1	

APPENDIX A-2 (Continued)

"Modified" Cause/ Factor[2]	NTSB File No.	No. of Injuries: Fatal	Serious	Minor	None	Degree of Aircraft Damage: Destroyed	Substantial	Minor	No
Low Ceiling/ Visibility: IFR Approach	0109			3	3		X		
	0112		3			X			
	0313			1		X			
	0542		4				X		
	0879	3				X			
	0888	2				X			
	0911	1				X			
	1430		1				X		
	1459			3			X		
	1808	1				X			
	2114	4				X			
	2153	3					X		
	2658	3	2			X			
	2780	2				X			
	2831			3	2		X		
	2966			2		X			
	2996	3				X			
	3038	2				X			
	3231	1				X			
	3390	3	2			X			
	3392				2	X			
	3499		2			X			
	3644			1	7	X			
	3692	1				X			
	3886				1	X			
	3974	2	3			X			
	3981	2					X		
Subtotals	27	33	17	13	15	19	8	0	0
Thunderstorms	3375				1		X		
Subtotals	1	0	0	0	1	0	1	0	0
Temperature/ Dew Point	2627				4		X		
	3362				2		X		
Subtotals	2	0	0	0	6	0	2	0	0
Rain, Hydro-planning, or Wet Runway	3329				2		X		
Subtotals	1	0	0	0	2	0	1	0	0
Totals	71	33	20	30	74	19	50	1	1

APPENDIX A-3 - RECAP

247 total accidents (176 without WX observation; 71 with weather observation)
71 fatalities (.287 per accident or .139 probability per occupant)
45 serious injuries (.182 per accident or .088 probability per occupant)
69 minor injuries (.279 per accident or .135 probability per occupant)
325 no injuries (1.316 per accident or .637 probability per occupant)
51 aircraft totally destroyed (.206 probability per accident)
193 aircraft substantially damaged (.777 probability per accident)
1 aircraft minor damage (.004 probability per accident)
2 aircraft no damage (.008 probability per accident)

1/Source: Reference 37.
2/Modified in the sense that only one cause or factor was used to categorize an accident. Whenever more than one cause or factor was cited, that which appeared to have weighed most heavily in the accident sequence was used.

APPENDIX B

Critical Values

Critical Value Element	Base Year Value[1]	Inflator Ratio	1981 Value
Value of a Statistical Life	$530,000 (80$)	138.9[2]/127.3[3]	$ 580,000[4]
Unit Costs of Statistical Aviation Injuries:			
Serious	38,000 (80$)	See Footnote 5.	$ 42,000
Minor	15,000 (80$)	See Footnote 6.	16,000
Unit Replacement and Restoration Costs of General Aviation Aircraft (Excluding Turbojets/Fans):			
Replacement	$ 37,000 (78$)	235.4[7]/173.5[8]	$ 50,000[9]
Restoration	12,000 (78$)		16,000[9]
Value of Time of Air Travelers Per Hour	17.50 (80$)	138.9[2]/127.3[3]	19.00[10]
Variable Operating Costs of General Aviation Aircraft (Per Airborne Hour)	Fuel & Oil + Maintenance		
Single-engine piston, 1-3 seats	$ 9.93 + $ 6.24 (78$)	See Footnote 11.	$ 29.00[12]
Single-engine piston, 4 + seats	$ 12.41 + $ 9.53 (78$)	See Footnote 11.	$ 38.00[12]
Twin-engine piston, under 12,500 TOGW	$ 25.12 + $ 41.02 (78$)	See Footnote 13.	$ 104.00[12]
Twin-engine turboprop, under 12,500 TOGW	$ 54.61 + $ 77.35 (78$)	See Footnote 14.	$ 216.00[12]
Twin-engine turboprop, over 12,500 TOGW	$198.25 + $180.30 (78$)	See Footnote 14.	$ 655.00[12]
Twin-engine turbojet/fan, under 20,000 TOGW	$252.05 + $162.28 (78$)	See Footnote 14.	$ 748.00[12]
Twin-engine turbojet/fan, over 20,000 TOGW	$354.10 + $203.76 (78$)	See Footnote 14.	$1,020.00[12]
Multi-engine turbojet/fan, over 20,000 TOGW	$388.26 + $461.22 (78$)	See Footnote 14.	$1,421.00[12]
Piston rotorcraft	$ 13.73 + $ 25.19 (78$)	See Footnote 13.	$ 61.00[12]
Turbine rotorcraft	$ 22.44 + $ 55.79 (78$)	See Footnote 14.	$ 119.00[12]
Weighted Total			$ 84.00[15]

Footnotes to Appendix B

1/ Source: Reference 9.

2/ BLS index of adjusted hourly earnings, 1981 (1977=100).

3/ BLS index of adjusted hourly earnings, 1980 (1977=100).

4/ Rounded to nearest $10,000.

5/ Labor or earnings related cost in 1980 ($28,480) x Ratio of 1981 to 1980 index of adjusted hourly earnings where 1977=100 (138.9/127.3) = $31,075. Medical related costs in 1980 ($9,634) x Ratio of 1981 to 1980 consumer price index for total medical care where 1967=100 (295.1/267.2) = $10,640. Total equals $41,715, or $42,000 rounded to the nearest $1,000.

6/ Labor or earnings related costs in 1980 ($13,080) x Ratio of 1981 to 1980 index of adjusted hourly earnings where 1977=100 (138.9/127.3) = $14,272. Medical related costs in 1980 ($1,587) x Ratio of 1981 to 1980 consumer price index for total medical care where 1967=100 (295.1/267.2) = $1,753. Total equals $16,025 or $16,000 rounded to the nearest $1,000.

7/ BLS producer price index for total transportation equipment, 1981 (12/68=100).

8/ BLS producer price index for total transportation equipment, 1978 (12/68=100).

9/ Rounded to nearest $1,000.

10/ Rounded to nearest $.50.

11/ For fuel and oil: Ratio of 1981 to 1978 mean 80/87 aviation gas costs per gallon ($1.85/$.89). Source: Reference 38. For maintenance: Ratio of 1981 to 1978 BLS indices of adjusted hourly earnings where 1977=100: 138.9/108.4.

12/ Rounded to nearest $1.00.

13/ For fuel and oil: Ratio of 1981 to 1978 mean 100/130 aviation gas costs per gallon ($1.90/$.91). Source: Reference 38. For maintenance: Same as footnote 11 above.

14/ For fuel and oil: Ratio of 1981 to 1978 mean jet type A fuel costs per gallon ($1.70/$.79). Source: Reference 38. For maintenance: Same as footnote 11 above.

15/ Weighted by airborne hours per Reference 9.

APPENDIX C

Program Logic of AWOS Establishment Criteria

The AWOS establishment criteria developed in this report for non-towered and non-federal towered airports will be integrated as a FORTRAN subroutine into the Terminal Area Forecast Data System. This appendix outlines the program logic used to compute the Phase I and II benefit/cost ratios in Figures 34-A and 34-B of Chapter VI. Note that benefits and costs relating to freezing precipitation and thunderstorm detection/location are set equal to zero. At the date of this report, the typical AWOS installation is not envisioned by the FAA AWOS Program Office to initially include these sensors. The program also relies on national average values for PIFR and PC and assumes no proximity penalties or remoteness premiums. In actual practice, site-specific values for PIFR and PC will be used and proximity penalties and remoteness premiums will be imposed, if applicable.

```
            C      THIS PROGRAM (DSN=AWOS.FORT) IS DESIGNED TO COMPUTE BATCH
            C      BENEFIT/COST RATIOS FOR AUTOMATED WEATHER OBSERVING
            C      SYSTEMS (AWOS) AT NON-TOWERED AND NON-FEDERAL TOWERED
            C      AIRPORTS.  WITH MINOR MODIFICATIONS, THIS PROGRAM CAN
            C      ALSO BE APPLIED TO AIRPORTS DESIGNATED AS ATCT DISCON-
            C      TINUANCE CANDIDATES.  BENEFIT/COST LOGIC IS INCLUDED
            C      FOR WIND, TEMPERATURE, DEW POINT, ALTIMETER, CEILING,
            C      VISIBILITY AND LIQUID PRECIPITATION SENSORS.  WHILE
            C      THE BENEFIT/COST LOGIC FOR FREEZING PRECIPITATION AND
            C      THUNDERSTORM SENSORS ARE ALSO INCLUDED, THEIR VALUES
            C      ARE SUPPRESSED IN THIS PROGRAM APPLICATION.
            C
            C      ALL DOLLAR VALUES IN THIS PROGRAM ARE 1981 DOLLARS.
            C
0001               REAL LCC,MINOR,MIN,MLITN,MLLCL,INSBEN,MLAP,NUMER
0002               DATA NINES/'9999'/
0003               INTEGER Y,TOWRCD,SLOCID
0004               REAL*8 STATE,REG
0005               DIMENSION CITY(7)
            C
            C      ----FE = FACILITIES AND EQUIPMENT COSTS UNIQUE TO EACH SENSOR:
            C      WIND, TEMPERATURE/DEWPOINT, ALTIMETER, CEILING, VISIBILITY,
            C      LIQUID PRECIPITATION, FREEZING PRECIPITATION AND THUNDER-
            C      STORM.  WHILE PREFFE = 3208 AND THUNFE = 20160, THEY
            C      ARE SUPPRESSED IN THIS PROGRAM APPLICATION.
            C
0006               WINDFE=1736.
0007               TPDPFE=1408.
0008               ALTMFE=3456.
0009               CEILFE=36433.
0010               VISIFE=24808.
0011               PRELFE=1192.
0012               PREFFE=0.
0013               THUNFE=0.
            C
            C      ----OM = LIFE-CYCLE OPERATIONS AND MAINTENANCE COSTS UNIQUE
            C      TO EACH SENSOR: WIND, TEMPERATURE/DEWPOINT, ALTIMETER,
            C      CEILING, VISIBILITY, LIQUID PRECIPITATION, FREEZING
            C      PRECIPITATION AND THUNDERSTORM.  WHILE PREFOM = 479
            C      AND THUNOM = 3015, THEY ARE SUPPRESSED IN THIS PROGRAM
            C      APPLICATION.
            C
0014               WINDOM=263.
0015               TPDPOM=207.
0016               ALTMOM=518.
0017               CEILOM=5448.
0018               VISIOM=3709.
0019               PRELOM=175.
0020               PREFOM=0.
0021               THUNOM=0.
            C
            C      ----LC = LIFE-CYCLE COST UNIQUE TO EACH SENSOR: WIND,
```

```
      C     TEMPERATURE/DEWPOINT, ALTIMETER, CEILING, VISIBILITY, LIQUID
      C     PRECIPITATION, FREEZING PRECIPITATION AND THUNDERSTORM.
      C
0022        WINDLC=WINDFE+WINDOM
0023        TPDPLC=TPDPFE+TPDPOM
0024        ALTMLC=ALTMFE+ALTMOM
0025        CEILLC=CEILFE+CEILOM
0026        VISILC=VISIFE+VISIOM
0027        PRELLC=PRELFE+PRELOM
0028        PREFLC=PREFFE+PREFOM
0029        THUNLC=THUNFE+THUNOM
      C
      C     FIXED = FIXED LIFE-CYCLE COSTS COMMON TO ANY SYSTEM
      C
0030        FIXED = 49617.
      C
      C     COMM = OPTIONAL COMMUNICATIONS
      C
0031        COMM=21535.
      C
      C     LCC = TOTAL LIFE-CYCLE COST OF A GIVEN SYSTEM
      C     OVER A 15-YEAR ECONOMIC LIFE.
      C
0032        LCC=WINDLC+TPDPLC+ALTMLC+CEILLC+VISILC+PRELLC+PREFLC
           &+THUNLC+FIXED+COMM
      C
      C     D = OMB-PRESCRIBED DISCOUNT RATE
      C
0033        D=.10
      C
      C     --ITN = ANNUAL ITINERANT OPERATIONS BY USER CLASS
      C     PER TAF.  --LCL = ANNUAL LOCAL OPERATIONS BY USER
      C     CLASS PER TAF.  AP = TOTAL ANNUAL INSTRUMENT APPROACHES
      C     PER TAF.  GAAP = GA ANNUAL INSTRUMENT APPROACHES PER
      C     TAF.  MLAP = MILITARY ANNUAL INSTRUMENT APPROACHES PER
      C     TAF.
      C
0034        DIMENSION ACITN(15),ATITN(15),GAITN(15),MLITN(15),
           &GALCL(15),MLLCL(15),AP(15),GAAP(15),MLAP(15)
      C
      C     ARPORT = AIRPORT NAME
      C
0035        DIMENSION ARPORT(11)
      C
      C     CRITICAL VALUES: VALUE OF A STATISTICAL
      C     LIFE (VALLIF), UNIT COST OF A STATISTICAL SERIOUS INJURY
      C     (CSTSIN), UNIT COST OF A STATISTICAL MINOR INJURY
      C     (CSTMIN), REPLACEMENT VALUE OF A GA AIRCRAFT, NET OF
      C     TURBOJETS/FANS (DESTRY), RESTORATION COST OF A
      C     SUBSTANTIALLY-DAMAGED GA AIRCRAFT, NET OF TURBOJETS/
      C     FANS (SUBDAM), RESTORATION COST OF A MINORLY-DAMAGED
      C     GA AIRCRAFT, NET OF TURBOJETS/FANS (MINOR).
```

```
              C
0036                VALLIF=580000.
0037                CSTSIN=42000.
0038                CSTMIN=16000.
0039                DESTRY=50000.
0040                SUBDAM=16000,
0041                MINOR=8000.
              C
              C     PAIFD = PROBABILITY OF AVERTING A GA INSTRUMENT FLIGHT
              C     DISRUPTION (DECIMAL)
              C
0042                PAIFD=.10
              C
              C     CIFD = UNIT COST OF A GA INSTRUMENT FLIGHT DISRUPTION
              C
0043                CIFD=93.
              C
              C     FIA = FRACTION OF TOTAL GA ITINERANT OPERATIONS THAT ARE
              C     ARRIVALS (DECIMAL)
              C
0044                FIA=.50
              C
              C     FVC = FRACTION OF GA ITINERANT ARRIVALS CONDUCTED IN
              C     VISUAL CONDITIONS (DECIMAL)
              C
0045                FVC=.968
              C
              C     FO = FRACTION OF GA ITINERANT ARRIVALS THAT CAN
              C     BE EXPECTED TO OVERFLY IN THE ABSENCE OF A
              C     WEATHER OBSERVATION (DECIMAL)
              C
0046                FO=.195
              C
              C     CAO = UNIT COST OF AN OVERFLIGHT
              C
0047                CAO=.70
              C
              C     QUAL- = COUNTERS FOR NUMBER OF LOCATIONS HAVING
              C     PHASE II B/C RATIOS OF LESS THAN .50, .50 TO .99,
              C     1.00 TO 1.49, 1.50 TO 1.99, AND 2.00 OR GREATER.
              C
0048                QUALA=0.
0049                QUALB=0.
0050                QUALC=0.
0051                QUALD=0.
0052                QUALE=0.
              C
              C     LOCID AND SLOCID = LOCATION IDENTIFIER CODES FROM TAF
              C     AND SCI FILES, RESPECTIVELY.  TOWRCD = TOWER CODE.
              C     PIFR AND RPIFR = PROBABILITY (%) OF WEATHER BELOW VFR MINIMA.
              C     PC AND RPC = PROBABILITY (%) OF WEATHER BELOW IFR MINIMA.
              C     TAF IDENT: DD DSN=FAA114.TAF80.FINAL.OCT1882.LOCID.DATA,
```

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                C     UNIT=3400-4,VOL=SER=W54244,LABEL=(,NL),DISP=(OLD,KEEP),
                C     DCB=(RECFM=F,LRECL=7420,BLKSIZE=7420,DEN=3)
                C     SCI IDENT:  DD DSN=FAA116.SAM.P341.VFRIFR.NONTWR.SCI.DATA,
                C     DISP=SHR
                C
0053                  READ(10,10)SLOCID,RPIFR,RPC
0054               10 FORMAT(A4,F5.2,1X,F5.2)
0055                  PRINT20
0056               20 FORMAT('-',60X,'FIGURE 34-A')
0057                  PRINT30
0058               30 FORMAT('-',28X,'RESULTS OF APPLYING CRITERIA TO ',
                     &'NON-TOWERED AND NON-FEDERAL TOWERED AIRPORTS')
0059                  PRINT40
0060               40 FORMAT('-',95X,'LC',7X,'LC',4X,'GA+ML')
0061                  PRINT50
0062               50 FORMAT(' ',93X,'SAFETY',3X,'EFFICY',2X,'AIAS',3X,
                     &'PHASE',3X,'PHASE')
0063                  PRINT60
0064               60 FORMAT(' ',7X,'REG',3X,'LOC',6X,'AIRPORT NAME',30X,'CITY',
                     &19X,'ST',5X,'BENS',5X,'BENS',3X,'YR 1',3X,'I B/C#',2X,
                     &'II B/C#')
0065                  PRINT70
0066               70 FORMAT('-')
0067               80 CONTINUE
                C
                C     BCI = PHASE I BENEFIT/COST RATIO.  INITIALIZED AT 0.
                C
0068                  BCI=0.
                C
                C     COUNT = SUM OF GA AND MILITARY ANNUAL INSTRUMENT
                C     APPROACHES IN YEAR 1. INITIALIZED AT 0.
                C
0069                  COUNT=0.
                C
                C     Y = EACH YEAR OF A SYSTEM'S ASSUMED USEFUL LIFE
                C     OF 15 YEARS
                C
0070                  Y=1.
                C
                C     COMBEN = ANNUAL BENEFIT TO EITHER THE AIR CARRIER
                C     OR, REPEAT OR, AIR TAXI USER CLASSES.  INITIALIZED AT 0.
                C
0071                  COMBEN=0.
                C
                C     AIA- = PROJECTED ANNUAL INSTRUMENT APPROACHES OF GA
                C     AND MILITARY USER CLASSES.  INITIALIZED AT 0.
                C
0072                  AIAG=0.
0073                  AIAM=0.
                C
                C     ANSAFB = GA AND MILITARY SAFETY BENEFITS IN YEAR Y.
                C     INITIALIZED AT 0.
```

```
                 C
0074                  ANSAFB=0.
                 C
                 C    ANDELB = GA AND MILITARY FLIGHT DISRUPTION BENEFITS
                 C    IN YEAR Y.  INITIALIZED AT 0.
                 C
0075                  ANDELB=0.
                 C
                 C    ANDBEN = SUM OF ANSAFB AND ANDELB.  INITIALIZED AT 0.
                 C
0076                  ANDBEN=0.
                 C
                 C    ---LCY = LIFE-CYCLE BENEFITS FOR EFFICIENCY (DELLCY),
                 C    SAFETY (SAFLCY) AND TOTAL (TOTLCY). INITIALIZED AT 0.
                 C
0077                  DELLCY=0.
0078                  SAFLCY=0.
0079                  TOTLCY=0.
                 C
0080               90 READ(11,100,END=260)REG,STATE,CITY,ARPORT,LOCID,TOWRCD,
                     &ACITN,ATITN,GAITN,GALCL,MLITN,MLLCL,GAAP,MLAP,AP
0081              100 FORMAT(A5,A5,6A4,A2,10A4,A2,A4,10X,I1,17(100X),92X,
                     &15F9.0,45X,15F9.0,45X,15F9.0,45X,15F9.0,45X,
                     &15F9.0,45X,15F9.0,9(100X),45X,15F9.0,45X,
                     &15F9.0,45X,15F9.0)
                 C
                 C    MIN = CONTROL FOR AVAILABILITY OF MINIMA FROM
                 C    SCI DATA FILE: 0 = NO;  1 = YES.
                 C
0082                  MIN=1.
                 C
0083                  IF(TOWRCD.NE.0.AND.TOWRCD.NE.7.AND.TOWRCD.NE.9) GO TO 90
0084              110 IF(LOCID.LT.SLOCID) GO TO 130
0085                  IF(LOCID.EQ.SLOCID) GO TO 140
0086                  READ(10,10,END=120) SLOCID,RPIFR,RPC
0087                  GO TO 110
0088              120 SLOCID=NINES
0089                  GO TO 110
0090              130 CONTINUE
0091                  MIN = 0.
0092                  PIFR=13.5
0093                  PC=4.95
0094                  GO TO 150
0095              140 CONTINUE
0096                  PIFR=RPIFR
0097                  PC=RPC
                 C
                 C    TOTOPS = TOTAL AIRCRAFT OPERATIONS IN YEAR Y
                 C
0098              150 TOTOPS=ACITN(Y)+ATITN(Y)+GAITN(Y)+GALCL(Y)+MLITN(Y)+MLLCL(Y)
                 C
0099                  IF(TOTOPS.NE.0) GO TO 160
```

```
0100            GO TO 210
0101        160 CONTINUE
0102            AIAG = (GAITN(Y)*.5)*((PIFR-PC)/100)*(.8-(.5*(GAITN(Y)
               &/TOTOPS)))
0103            IF(AIAG.EQ.0.OR.GAAP(Y).EQ.0) GO TO 170
0104            GO TO 180
0105        170 AIAM=MLAP(Y)
0106            GO TO 190
0107        180 CONTINUE
0108            AIAM=(AIAG/GAAP(Y))*MLAP(Y)
0109        190 CONTINUE
0110            IF(AP(Y).NE.0) GO TO 200
0111            AIAG=0.
0112            AIAM=0.
0113            MIN=1.
0114        200 CONTINUE
0115            IF(Y.EQ.1) COUNT=AIAG+AIAM
          C
          C     ---SAF = ANNUAL SAFETY BENEFITS TO THE GA AND MILITARY
          C     USER CLASSES BY SENSOR: WIND, TEMPERATURE/DEW POINT,
          C     CEILING/VISIBILITY, PRECIPITATION AND THUNDERSTORM.
          C     FOR PURPOSES OF THIS PROGRAM APPLICATION, THNSAF IS
          C     SUPPRESSED.
          C
0116            WINSAF=(((8*VALLIF)+(18*CSTSIN)+(47*CSTMIN)+(15*DESTRY)
               &+(162*SUBDAM)+(1*MINOR))/180)*((.000003704*(GAITN(Y)+
               &MLITN(Y)))+(.000002222*(GALCL(Y)+MLLCL(Y))))
0117            CLVSAF=(((63*VALLIF)+(25*CSTSIN)+(17*CSTMIN)+(35*DESTRY)
               &+(17*SUBDAM)+(0*MINOR))/52)*.0000865*(AIAG+AIAM)
0118            THNSAF=(((0*VALLIF)+(0*CSTSIN)+(1*CSTMIN)+(0*DESTRY)
               &+(3*SUBDAM)+(0*MINOR))/3)*((.000000029*(GAITN(Y)+
               &MLITN(Y)))+(.000000017*(GALCL(Y)+MLLCL(Y))))
0119            TPDSAF=(((0*VALLIF)+(0*CSTSIN)+(4*CSTMIN)+(0*DESTRY)
               &+(7*SUBDAM)+(0*MINOR))/7)*((.000000101*(GAITN(Y)+
               &MLITN(Y)))+(.00000006*(GALCL(Y)+MLLCL(Y))))
0120            PRESAF=(((0*VALLIF)+(2*CSTSIN)+(0*CSTMIN)+(1*DESTRY)
               &+(4*SUBDAM)+(0*MINOR))/5)*((.000000113*(GAITN(Y)+
               &MLITN(Y)))+(.000000067*(GALCL(Y)+MLLCL(Y))))
0121            THNSAF=0.
          C
          C     ANSAFB = ANNUAL SAFETY BENEFITS
          C
0122            ANSAFB=WINSAF+TPDSAF+CLVSAF+PRESAF+THNSAF
          C
          C     NUMER = NUMERATOR IN RATIO FOR COMPUTING AIR CARRIER
          C     AND AIR TAXI BENEFITS.
          C
0123            NUMER=ACITN(Y)+ATITN(Y)
          C
0124            IF(NUMER.GT.3000) NUMER=3000
0125            COMBEN=(NUMER/3000)*9548
          C
```

```
               C      INSBEN = ANNUAL BENEFITS OF AVERTED GA AND MILITARY
               C      INSTRUMENT FLIGHT DISRUPTIONS
               C
0126                  INSBEN=(AIAG+AIAM)*PAIFD*CIFD
               C
               C      VISBEN=ANNUAL BENEFITS OF AVERTED GA AND MILITARY VISUAL
               C      FLIGHT DISRUPTIONS
               C
0127                  VISBEN=FIA*FVC*FO*CAO*((GAITN(Y)+MLLCL(Y))+((GALCL(Y)+
                     &MLLCL(Y))*.6))
               C
               C      ANDELB = TOTAL EFFICIENCY BENEFITS
               C
0128                  ANDELB=COMBEN+INSBEN+VISBEN
               C
               C      ANDBEN = TOTAL ANNUAL BENEFITS
               C
0129                  ANDBEN=ANSAFB+ANDELB
               C
0130                  SAFLCY=SAFLCY+(ANSAFB*(1/((1+D)**Y-.5)))
0131                  DELLCY=DELLCY+(ANDELB*(1/((1+D)**Y-.5)))
0132                  TOTLCY=TOTLCY+(ANDBEN*(1/((1+D)**Y-.5)))
               C
               C      AR = RECIPROCAL OF PROXIMITY PENALTY OR REMOTENESS
               C      PREMIUM.  FOR PURPOSES OF THIS PROGRAM APPLICATION,
               C      AR IS ASSUMED EQUAL TO 1.
               C
0133                  AR=1.
               C
0134                  IF(Y.NE.1) GO TO 210
               C
               C      --BEN = PER OPERATION BENEFITS (FOR PHASE I), APPLIED
               C      TO LIFE-CYCLE INFLATOR FACTOR, BY SENSOR:  WIND, TEMP-
               C      ERATURE/DEW POINT, ALTIMETER, CEILING/VISIBILITY, PRE-
               C      CIPITATION AND THUNDERSTORM.  FOR PURPOSES OF THIS PROGRAM
               C      APPLICATION, THNBEN IS SUPPRESSED.
               C
0135                  WINBEN=(.2624*(GAITN(1)+MLITN(1)))+(.1575*(GALCL(1)+MLLCL
                     &(1)))
0136                  TPDBEN=(.0025*(GAITN(1)+MLITN(1)))+(.0015*(GALCL(1)+MLLCL
                     &(1)))
0137                  ALTBEN=.1488*(GAITN(1)+MLITN(1))
0138                  IF(GAAP(1).EQ.0.AND.MLAP(1).EQ.0) ALTBEN=0.
0139                  CLVBEN=1.064*(GAITN(1)+MLITN(1))
0140                  IF(GAAP(1).EQ.0.AND.MLAP(1).EQ.0) CLVBEN=0.
0141                  PREBEN=(.0045*(GAITN(1)+MLITN(1)))+(.0027*(GALCL(1)+MLLCL
                     &(1)))
0142                  THNBEN=(.0007*(GAITN(1)+MLITN(1)))+(.0004*(GALCL(1)+MLLCL
                     &(1)))
0143                  THNBEN=0.
               C
0144                  BCI=(((COMBEN*7.976)+((WINBEN+TPDBEN+ALTBEN+CLVBEN+PREBEN+
```

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                 &THNBEN)*14.5))*AR)/LCC
0145         210 CONTINUE
0146             Y=Y+1.
0147             IF(Y.LE.15) GO TO 150
           C
           C     BCII = PHASE II BENEFIT/COST RATIO
           C
0148             BCII=(TOTLCY/LCC)*AR
           C
0149         220 CONTINUE
0150             IF(BCII.LT..5) QUALA=QUALA+1.
0151             IF(BCII.GE..5.AND.BCII.LT.1) QUALB=QUALB+1.
0152             IF(BCII.GE.1.AND.BCII.LT.1.5) QUALC=QUALC+1.
0153             IF(BCII.GE.1.5.AND.BCII.LT.2) QUALD=QUALD+1.
0154             IF(BCII.GE.2) QUALE=QUALE+1.
0155             IF(MIN.NE.0) GO TO 240
0156             PRINT230,REG,LOCID,ARPORT,CITY,STATE,SAFLCY,DELLCY,COUNT,BCI,BCII
0157         230 FORMAT(' ',7X,A5,1X,A4,1X,10A4,A2,6A4,A2,1X,A5,F8.0,1X,F8.0,1X,
                &F5.0,1X,F5.2,'*',2X,F5.2,'*')
0158             WRITE(14,235)REG,LOCID,ARPORT,CITY,STATE,SAFLCY,DELLCY,COUNT,
                &BCI,BCII
0159         235 FORMAT(A5,A4,10A4,A2,6A4,A2,A5,F8.0,F8.0,1X,F5.0,F5.2,'*',F5.2,
                &'*')
0160             NUMER=0.
0161             GO TO 80
0162         240 PRINT250,REG,LOCID,ARPORT,CITY,STATE,SAFLCY,DELLCY,COUNT,BCI,BCII
0163         250 FORMAT(' ',7X,A5,1X,A4,1X,10A4,A2,6A4,A2,1X,A5,F8.0,1X,F8.0,1X,
                &F5.0,1X,F5.2,3X,F5.2)
0164             WRITE(14,255)REG,LOCID,ARPORT,CITY,STATE,SAFLCY,DELLCY,COUNT,
                &BCI,BCII
0165         255 FORMAT(A5,A4,10A4,A2,6A4,A2,A5,F8.0,F8.0,F5.0,F5.2,1X,F5.2)
0166             GO TO 80
0167         260 CONTINUE
0168             PRINT270
0169         270 FORMAT('1')
0170             DO 280 K=1,5
0171         280 PRINT290
0172         290 FORMAT('-')
0173             PRINT300
0174         300 FORMAT('-',59X,'RECAP')
0175             PRINT310,QUALA
0176         310 FORMAT('-',25X,'TOTAL LOCATIONS HAVING PHASE II ',
                &'BENEFIT/COST RATIOS OF LESS THAN .50',5X,F5.0)
0177             PRINT320,QUALB
0178         320 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
                &'BENEFIT/COST RATIOS FROM .50 TO .99',6X,F5.0)
0179             PRINT330,QUALC
0180         330 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
                &'BENEFIT/COST RATIOS FROM 1.00 TO 1.49',4X,F5.0)
0181             PRINT340,QUALD
0182         340 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
                &'BENEFIT/COST RATIOS FROM 1.50 TO 1.99',4X,F5.0)
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 0183                PRINT350,QUALE                                                    00004220
 0184            350 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',                00004230
                    &'BENEFIT/COST RATIOS OF 2.00 OR GREATER',3X,F5.0)                 00004240
 0185                TOTAL = QUALA+QUALB+QUALC+QUALD+QUALE                             00004250
 0186                PRINT360,TOTAL                                                    00004260
 0187            360 FORMAT('0',25X,'TOTAL LOCATIONS',58X,F5.0)                        00004270
 0188                PRINT370                                                          00004280
 0189            370 FORMAT('-',8X,'# BENEFIT/COST RATIO BEFORE PROXIMITY PENALTY ',   00004290
                    &'OR REMOTENESS PREMIUM IF ANY.')                                  00004300
 0190                PRINT380                                                          00004310
 0191            380 FORMAT('-',7X,'* AIRPORTS WITH INSTRUMENT APPROACH PROCEDURES ', 00004320
                    &'FOR WHICH GENERAL AVIATION AND MILITARY ANNUAL INSTRUMENT ',     00004330
                    &'APPROACHES'/11X,'(AIAS) WERE COMPUTED WITH THE SCI MODEL ',      00004340
                    &'USING NATIONAL NORMS FOR PIFR (13.5%) AND PC (4.95%) ARE ',      00004350
                    &'IDENTIFIED BY *.'/11X,'FOR OTHER AIRPORTS WITH INSTRUMENT ',     00004360
                    &'APPROACH PROCEDURES AIAS WERE COMPUTED WITH THE SCI ',           00004370
                    &'MODEL USING VALUES FOR PIFR')                                    00004380
 0192                PRINT390                                                          00004390
 0193            390 FORMAT(' ',10X,'AND PC BASED ON SITE-',                           00004400
                    &'SPECIFIC MINIMA IN THE SCI FILE.  FOR AIRPORTS WITHOUT ',        00004410
                    &'RECORDED AIAS IN THE TAF THE SCI MODEL'/                         00004420
                    &11X,'USED TO  REDICT AIAS WAS SUPPRESSED.')                       00004430
 0194                STOP                                                              00004440
 0195                END                                                               00004450
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