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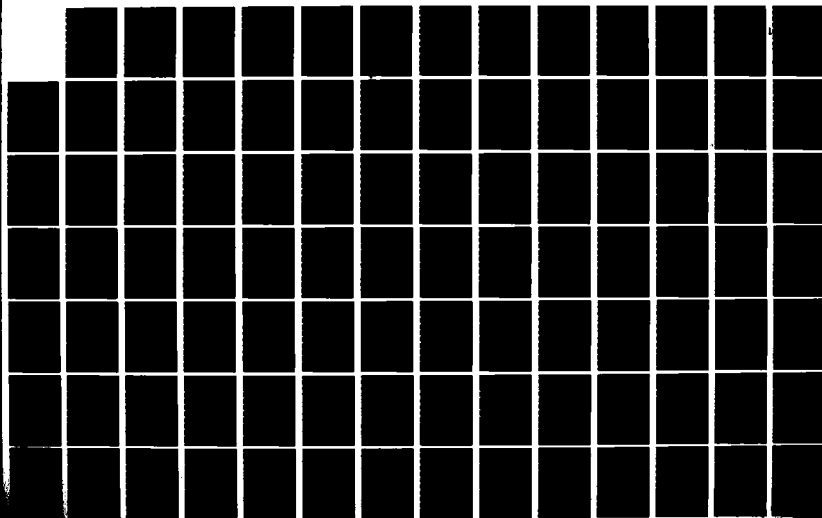
ESTABLISHMENT AND DISCONTINUANCE CRITERIA FOR AUTOMATED 1/2  
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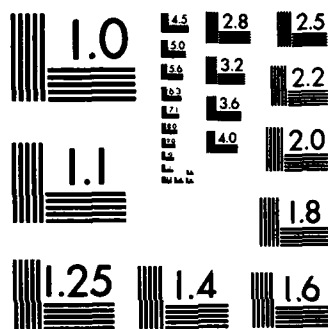
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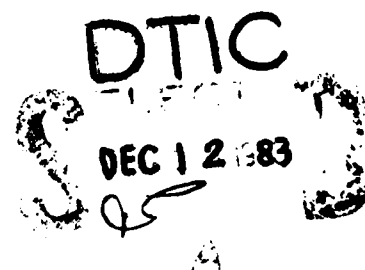


U.S. Department  
of Transportation  
Federal Aviation  
Administration

1.2

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

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



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May 1983

Ward L. Keech

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| 16. Abstract<br>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.<br><br>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 additional locations, the escalating 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 1 - 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)                         | <u>161</u> | 377   |
| NWS/NWS Contract Personnel                                |            |       |
| Weather Service Forecast Offices (WSFO)                   | 31         |       |
| Weather Service Offices (WSO)                             | 176        |       |
| Weather Meteorological Offices (WSMO)                     | 12         |       |
| Weather Service Contract Meteorological Offices (WSCMO)   | 15         |       |
| Synoptic Weather Observing Stations                       | 15         |       |
| Contract Basic Weather Observation Stations               | 142        |       |
| Automatic Meteorological Observing Stations               | 66         |       |
| Coast Guard/Marine Reporting Stations                     | <u>184</u> | 641   |
| Supplementary Aviation Weather Reporting Stations (SAWRS) |            |       |
|                                                           | <u>276</u> | 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

| <u>General Aviation and Military</u> | <u>Per Itinerant<br/>Operation</u> | <u>Per Local<br/>Operation</u> |
|--------------------------------------|------------------------------------|--------------------------------|
| 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)x\$TOTAL = xxxx

(GALCL+MILLCL)x\$TOTAL = xxxx

Phase I Value (If 1.0 or greater, location satisfies  
Phase I Establishment Criteria)

Total x 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-precipitations 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

| <u>General Aviation and Military</u> | <u>Per Itinerant<br/>Operation</u> | <u>Per Local<br/>Operation</u> |
|--------------------------------------|------------------------------------|--------------------------------|
| 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)x\$TOTAL = xxxx

(GALCL+MILLCL)x\$TOTAL = xxxx

Phase I Value (If 1.0 or greater, location satisfies  
Phase I Establishment Criteria) Total x AR  
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 sensing 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 compatibility of the sensors with the processor, the signal conditioner may be omitted.

FIGURE 2

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

| <u>FACILITIES AND EQUIPMENT</u> <sup>1/</sup>                      | <u>FMA Towered Airports</u> | <u>Non-Towered Airports</u> |
|--------------------------------------------------------------------|-----------------------------|-----------------------------|
| <u>SENSORS</u>                                                     |                             |                             |
| Wind (Direction and Speed)                                         | \$ 880                      | \$ 880                      |
| Ambient Temperature and Dew Point                                  | 470                         | 470                         |
| Dual Altimeter Setting Sensors                                     | 2,160                       | 2,160                       |
| Laser Cellometer                                                   | 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                       | + 570                       |
|                                                                    | \$ 57,090                   | \$ 57,090                   |
| <u>SIGNAL CONDITIONING</u>                                         |                             |                             |
| Enclosure, Rack, Power Supply                                      | \$ 1,210                    | \$ 1,210                    |
| Modules for Wind, Temperature, Dewpoint, Visibility, Precipitation | 1,230                       | 1,230                       |
| Communications Interface Module                                    | + 410                       | + 410                       |
|                                                                    | 2,850                       | 2,850                       |
|                                                                    | 3,440                       | 3,440                       |
| <u>CENTRAL PROCESSOR (Including software program)</u>              |                             |                             |
| <u>OUTPUT EQUIPMENT</u>                                            |                             |                             |
| CRT Display                                                        | \$ 1,310                    | -                           |
| Teletype Printer                                                   | 1,850                       | -                           |
| Voice Generator                                                    | 1,800                       | \$ 1,800                    |
| Telephone Answering Device                                         | 360                         | 360                         |
| Modem                                                              | + 210                       | + 210                       |
|                                                                    | \$ 5,530                    | + 2,370                     |
| <u>TOTAL EQUIPMENT COST</u>                                        | \$ 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                    |
| <u>TOTAL F&amp;E COSTS (INSTALLED)</u>                             | \$110,260                   | \$105,200                   |
| <u>OPERATIONS AND MAINTENANCE</u>                                  |                             |                             |
| <u>PERSONNEL</u>                                                   |                             |                             |
| Observation                                                        | \$ 2,162                    | \$ 0                        |
| Maintenance                                                        | + 712                       | + 2,268                     |
| SPARES INVENTORY (2% of "Total Equipment Cost")                    | \$ 2,874                    | \$ 2,268                    |
| COMMUNICATIONS (with Longline) <sup>2/</sup>                       | 2,067                       | 1,973                       |
| FACILITIES                                                         | 2,920                       | 2,920 <sup>2/</sup>         |
| TOTAL ANNUAL O&M COSTS <sup>3/</sup>                               | + 2,404                     | + 1,888                     |
| x LIFE-CYCLE DISCOUNT FACTOR <sup>4/</sup>                         | \$ 10,625                   | \$ 9,049                    |
| <u>TOTAL LIFE-CYCLE O&amp;M COSTS</u>                              | \$ 7,976                    | \$ 7,976                    |
|                                                                    | \$ 81,874                   | \$ 72,175                   |
| <u>TOTAL LIFE-CYCLE COST</u>                                       | \$192,134                   | \$177,375                   |

<sup>1/</sup>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 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.  
<sup>2/</sup>Optional for non-towered airports. Related to distance.  
<sup>3/</sup>Source: Reference 2 (modified).  
<sup>4/</sup>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 AMOS Installations at FAA Towered Airports (1981 Dollars)<sup>1/</sup>

| VARIABLE COSTS UNIQUE TO SENSING DEVICES  |                                     |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
|-------------------------------------------|-------------------------------------|--------------------------------------------|------------------------------------------|--------------------------|---------------------------------------------|-----------------------------|---------------------------------|----------------------------------------|--|
|                                           | Wind<br>(Direc-<br>tion &<br>Speed) | Ambient<br>Temper-<br>ature &<br>Dew Point | Dual Alti-<br>meter Set-<br>ting Sensors | Laser<br>Cello-<br>meter | Visibility<br>(Forward<br>Scatter<br>Meter) | Liquid<br>Precip.<br>(Qty.) | Freezing<br>Precip.<br>(Yes/No) | Thunderstorm<br>Detection/<br>Location |  |
| <b>FACILITIES AND EQUIPMENT</b>           |                                     |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
| Sensor (including modules)                |                                     | \$ 880                                     | \$2,160                                  | \$22,770                 | \$15,505                                    | \$ 745                      | \$2,005                         | \$12,600                               |  |
| Tower, Guys, Anchors                      | \$ 570                              |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
| Other Signal Conditioning                 | 1,620                               |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
| Central Processor and<br>Software Program | 3,440                               |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
| Output Equipment                          | 5,530                               | 220                                        | 540                                      | 5,693                    | 3,876                                       | 186                         | 501                             | 3,150                                  |  |
| Initial Spares (@ 25%)                    | 2,790                               | + 308                                      | + 756                                    | + 7,970                  | + 5,427                                     | + 261                       | + 702                           | + 4,410                                |  |
| Other P&E (@ 35%)                         | + 3,906                             | \$1,408                                    | \$3,456                                  | \$36,433                 | \$24,808                                    | \$1,192                     | \$3,208                         | \$20,160                               |  |
| Total                                     | \$17,856                            |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
|                                           | \$1,085                             |                                            |                                          |                          |                                             |                             |                                 |                                        |  |
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\*LIFE-CYCLE COST OF A GIVEN SYSTEM = \$85,915 + SUM OF VARIABLE COSTS UNIQUE TO APPLICABLE SENSING 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 ANOS Installations at Non-Towered Airports (1981 Dollars)<sup>1/</sup>

| VARIABLE COSTS UNIQUE TO SENSING DEVICES                         |                          |                                 |                                |                   |                         |  |                       |                           |                                 |
|------------------------------------------------------------------|--------------------------|---------------------------------|--------------------------------|-------------------|-------------------------|--|-----------------------|---------------------------|---------------------------------|
| FIXED COSTS                                                      | Wind (Direction & Speed) | Ambient Temperature & Dew Point | Dual Altimeter Setting Sensors | Laser Cello-meter | Visibility              |  | Liquid Precip. (Qty.) | Freezing Precip. (Yrs/Mo) | Thunderstorm Detection/Location |
|                                                                  |                          |                                 |                                |                   | (Forward Scatter Meter) |  |                       |                           |                                 |
| Sensor (including modules) Tower, Guys, Anchors                  | \$ 570                   | \$ 880                          | \$2,160                        | \$22,770          | \$15,505                |  | \$ 745                | \$2,005                   | \$12,600                        |
| Other Signal Conditioning Central Processor and Software Program | 1,620                    |                                 |                                |                   |                         |  |                       |                           |                                 |
| Output Equipment                                                 | 3,440                    |                                 |                                |                   |                         |  |                       |                           |                                 |
| Initial Spares (@ 25%)                                           | 2,370                    |                                 |                                |                   |                         |  |                       |                           |                                 |
| Other P&E (@ 35%)                                                | 2,000                    | 220                             | 540                            | 5,693             | 3,876                   |  | 186                   | 501                       | 3,150                           |
| Total                                                            | + 2,800                  | + 308                           | + 756                          | + 7,970           | + 5,427                 |  | + 261                 | + 702                     | + 4,410                         |
|                                                                  | \$12,800                 | \$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                      |                                 |                                |                   |                         |  |                       |                           |                                 |
| Communications <sup>2/</sup>                                     | 220                      | \$ 26                           | \$ 65                          | \$ 683            | \$ 465                  |  | \$ 22                 | \$ 60                     | \$ 378                          |
| Facilities                                                       |                          |                                 |                                |                   |                         |  |                       |                           |                                 |
| Annual Total                                                     | + 1,888                  |                                 |                                |                   |                         |  |                       |                           |                                 |
|                                                                  | \$ 4,616                 | \$ 26                           | \$ 65                          | \$ 683            | \$ 465                  |  | \$ 22                 | \$ 60                     | \$ 378                          |
| x Life-Cycle Discount Factor <sup>3/</sup>                       | x 7.976                  | x 7.976                         | x 7.976                        | x 7.976           | x 7.976                 |  | x 7.976               | x 7.976                   | x 7.976                         |
| Total                                                            | \$36,817                 | \$ 207                          | \$ 518                         | \$ 5,448          | \$ 3,709                |  | \$ 175                | \$ 479                    | \$ 3,015                        |
| TOTAL LIFE-CYCLE COST*                                           | \$49,617                 | \$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 SENSING DEVICES (ADD \$21,535 IF SYSTEM HAS LONGLINE COMMUNICATIONS.)

<sup>1/</sup> Source: Reference 2 (modified).

<sup>2/</sup> Does not include longline communications.

<sup>3/</sup> 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  $((.25 \times (1-.95)) = .0125; .0125 \times 24 \text{ hrs./day} \times 60 \text{ mins./hr.} = 18 \text{ minutes})$ . 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:

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

- 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 person-days per year to accommodate 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:

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

- 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)<sup>1/</sup>

|                                                               |             |              |                   |
|---------------------------------------------------------------|-------------|--------------|-------------------|
| (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                                                      | <u>+ 20</u> | <u>- 268</u> | 1,812             |
| (C) Net Annual Personyears (A/B)                              |             |              | 4.83              |
| (D) Annual Supervisory Personyears                            |             |              | <u>+ .61</u>      |
| (E) Total Annual Personyears (C + D)                          |             |              | 5.44              |
| (F) Fraction of Observer's Time Required to Augment AWOS      |             |              | <u>x .0125</u>    |
| (G) Personyears Required Annually to Augment AWOS (E x F)     |             |              | .0680             |
| (H) Average Annual Salary after Fringe Benefits <sup>2/</sup> |             |              | <u>x \$31,795</u> |
| (I) Annual Observation Personnel Costs (G x H)                |             |              | \$ 2,162          |

<sup>1/</sup>Source: Reference 2 (modified).

<sup>2/</sup>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<br>Towered Airports | Non-Towered Airports |                     |
|-----------|-------------------------|----------------------|---------------------|
|           |                         | With<br>Longline     | Without<br>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 accommodate 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 sensing 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           | <u>+23,175</u> | <u>+106,215</u> |
|                        |                | \$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                           | <u>+23,175</u> | <u>+106,215</u> |
|                                        |                | \$155,832       |
| Longline communications, if applicable |                | <u>+ 21,535</u> |
|                                        |                | \$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 thunderstorms, 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:

|                                                                            |                | <u>FAA Towered<br/>Airports</u> | <u>Non-Towered<br/>Airports</u> |
|----------------------------------------------------------------------------|----------------|---------------------------------|---------------------------------|
| Fixed Costs (Includes longline communications<br>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                                                       | <u>+ 1,367</u> | <u>+ 79,353</u>                 | <u>+ 79,353</u>                 |
|                                                                            |                |                                 | \$128,970                       |
| Longline communications, if applicable                                     |                | \$165,268                       | <u>+ 21,535</u>                 |
|                                                                            |                |                                 | \$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 Meteorological 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<br>Phenomenon<br>and User Class | Cost Per Accident (\$000)               |                                 | Adjusted Avertable Accident<br>Rate <sup>3</sup> / x 10 <sup>-6</sup> Per |            | Benefit Per |         |         |         |         |         |
|-----------------------------------------|-----------------------------------------|---------------------------------|---------------------------------------------------------------------------|------------|-------------|---------|---------|---------|---------|---------|
|                                         | Fatalities<br>and Injuries <sup>1</sup> | Aircraft<br>Damage <sup>2</sup> | Total                                                                     | Local Opn. | AC          |         | GA      |         | ML      |         |
|                                         |                                         |                                 |                                                                           |            | Itin        | Opn     | Itin    | Opn     | Itin    | Opn     |
| Wind                                    | \$                                      | \$2,733                         | \$ 3,625                                                                  | -          | \$ 2.983    |         | \$ .290 |         | \$ .170 | \$ .102 |
|                                         | AC                                      | 60                              | 176                                                                       | -          |             |         |         |         |         |         |
|                                         | AT                                      | 24                              | 69                                                                        | 1.481      |             |         |         |         |         |         |
|                                         | ML                                      | 608                             | 678                                                                       | 1.481      |             |         |         |         | \$1.674 | \$1.004 |
| Density Altitude                        | 207                                     | 2,400                           | 2,607                                                                     | -          | .175        |         | .005    |         | .002    | .001    |
|                                         | AC                                      | 52                              | 79                                                                        | -          |             |         |         |         |         |         |
|                                         | AT                                      | 21                              | 31                                                                        | .040       |             |         |         |         |         |         |
|                                         | ML                                      | 530                             | 546                                                                       | .040       |             |         |         |         | .037    | .022    |
| Ceiling/Visibility                      | 13,958                                  | 5,549                           | 19,507                                                                    | -          | 18.044      |         | 1.786   |         | .691    | -       |
|                                         | AC                                      | 122                             | 1,931                                                                     | -          |             |         |         |         |         |         |
|                                         | AT                                      | 50                              | 747                                                                       | -          |             |         |         |         |         |         |
|                                         | ML                                      | 1,247                           | 2,332                                                                     | -          |             |         |         |         | 2.157   | -       |
| Precipitation                           | 295                                     | 3,330                           | 3,625                                                                     | -          | .272        |         | .008    |         | .003    | .002    |
|                                         | AC                                      | 73                              | 111                                                                       | -          |             |         |         |         |         |         |
|                                         | AT                                      | 30                              | 45                                                                        | .045       |             |         |         |         |         |         |
|                                         | ML                                      | 744                             | 767                                                                       | .045       |             |         |         |         | .057    | .035    |
| Thunderstorms                           | 121                                     | 2,400                           | 2,521                                                                     | .019       | .048        |         | .001    |         | .001    | .000    |
|                                         | AC                                      | 52                              | 68                                                                        | .019       |             |         |         |         |         |         |
|                                         | AT                                      | 21                              | 27                                                                        | .019       |             |         |         |         |         |         |
|                                         | ML                                      | 530                             | 539                                                                       | .019       |             |         |         |         | .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)<sup>1/</sup>

|                                                                                                | AC         | AT        | GA       | ML       | TOTAL      | Annualized<br>Cost <sup>4/</sup> | D/C<br>Ratio |
|------------------------------------------------------------------------------------------------|------------|-----------|----------|----------|------------|----------------------------------|--------------|
| Mean, 431 ATCT's <sup>2/</sup>                                                                 | \$ 473,782 | \$ 23,646 | \$57,590 | \$14,604 | \$ 569,622 | \$65,653                         | 8.7          |
| Median <sup>2/</sup> , SRV                                                                     | 434,766    | 24,593    | 33,300   | 5,169    | 497,828    | 62,077                           | 8.0          |
| 5 Busiest ATCT's <sup>2/</sup>                                                                 |            |           |          |          |            |                                  |              |
| 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's <sup>2/</sup><br>excluding ATCT discontinuance<br>candidates <sup>3/</sup> |            |           |          |          |            |                                  |              |
| FME                                                                                            | 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          |
| GPK                                                                                            | 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          |

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

<sup>2/</sup> In terms of 1981 itinerant aircraft operations.

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

<sup>4/</sup> Derived from Figure 16 using weighted costs of manual weather observing systems with FAA, NWS, or WSCMO observation personnel:  $(\$59,350 \times .13147) + (\text{Total Annual O\&M Costs} - \text{Observation Personnel Costs}) + (\text{Daily Operating Hours}/24) \times \text{Observation Personnel Costs}$ . .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, spares 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)<sup>1/</sup>

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 <sup>2/</sup> | 2,430           |
| Display Terminal                            | + 1,810         |
|                                             | <u>\$47,480</u> |

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 <sup>2/</sup> | 2,430           |
| Display Terminal                            | + 1,220         |
|                                             | <u>\$ 6,730</u> |

SAWRS-Only Stations

|                                    |                 |
|------------------------------------|-----------------|
| Wind Direction and Speed           | \$ 810          |
| Ambient Temperature and Dew Point  | 50              |
| Altimeter Setting Indicator        | 230             |
| Sight Clinometer and Ceiling Light | + 810           |
|                                    | <u>\$ 1,900</u> |

<sup>1/</sup>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.

<sup>2/</sup>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                     |                         | NWS                     |          | SAWS                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-------------------------|-------------------------|----------|-------------------------|
|                                                                                                                                                      | ATCF                    | FSS                     | Observer                | MS/CMO   | Contract Basic          |
| (A) Annual Hrs. of Opn. (365 x 24)                                                                                                                   | 8,760                   | 8,760                   | 8,760                   | -        | 8,760                   |
| (B) Productive Hrs. Per Observer<br>Annual Hrs. Available (52 x 40)<br>Less: Vacations, Sick Leave,<br>Holidays and Training<br>Net Productive Hours | 2,080<br>- 268<br>1,812 | 2,080<br>- 268<br>1,812 | 2,080<br>- 268<br>1,812 | -        | 2,080<br>- 228<br>1,852 |
| (C) Net Annual Personyears (A/B)                                                                                                                     | 4.83                    | 4.83                    | 4.83                    | -        | 4.73                    |
| (D) Annual Supervisory Personyears 2/                                                                                                                | + .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<br>Observation Function                                                                                           | x .25                   | x .25                   | x .25                   | -        | x .25                   |
| (G) Productive Personyears for<br>Weather Observation Function (E x F)                                                                               | 1.36                    | 1.36                    | 1.36                    | -        | 1.26                    |
| (H) Average Annual Salary after<br>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 | \$21,168                |
| 16 Hour Per Day Facility                                                                                                                             | \$35,313                | \$26,817                | \$24,352                | \$56,200 | \$14,112                |
| 8 Hour Per Day Facility                                                                                                                              | \$17,656                | \$13,408                | \$12,176                | \$28,100 | \$ 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 SAWS.

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 WSCMD 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 WSCMD 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 WSCMD 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 WSCMD 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 irreparable equipment.

FIGURE 11

Personyears Devoted Annually to Maintain FAA/NWS/WSCMO  
Manual Weather Observing Systems<sup>1/</sup>

|                                                                                | <u>FAA/NWS/WSCMO</u> |
|--------------------------------------------------------------------------------|----------------------|
| (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                                                           | <u>1,812</u>         |
| (C) Net Annual Personyears (A/B)                                               | 1.61                 |
| (D) Annual Supervisory Personyears <sup>2/</sup>                               | <u>+ .20</u>         |
| (E) Total Annual Personyears (C + D)                                           | 1.81                 |
| (F) Fraction of Time Devoted to Weather Observation<br>Equipment <sup>3/</sup> | <u>x .36</u>         |
| (G) Personyears Devoted Annually to Weather Observation<br>Equipment (E x F)   | .65                  |

<sup>1/</sup>Source: Reference 2 (modified).

<sup>2/</sup>Assumes ratio of supervisors to employees of approximately 1:8.

<sup>3/</sup>See text.

FIGURE 12

Annual Costs of Maintenance Personnel for Manual  
Weather Observing Systems (1981 Dollars)<sup>1/</sup>

|                                                                  | <u>FAA/NWS/WSCMO</u>        | <u>Contract Basic</u> | <u>SAWS</u> |
|------------------------------------------------------------------|-----------------------------|-----------------------|-------------|
| Personyears Devoted Annually to Weather<br>Observation Equipment | .65 <sup>2/</sup>           |                       |             |
| Average Annual Salary after Fringe Benefits                      | <u>x32,498<sup>3/</sup></u> |                       |             |
| Annual Maintenance Personnel Costs                               | \$21,124                    | \$10,562              | \$300       |

<sup>1/</sup> Source: Reference 2 (modified).

<sup>2/</sup> From Figure 11.

<sup>3/</sup> 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<br>Stations (Except<br>SAWRS-Only) | Contract<br>Basic | SAWRS-<br>Only<br>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)<sup>1/</sup>

|                                       | <u>ATCT</u> | <u>FSS</u> | <u>NWS Observer/NWS Contract Observer</u> | <u>SAWRS</u> |
|---------------------------------------|-------------|------------|-------------------------------------------|--------------|
| Longline <sup>2/</sup>                |             | \$270      | \$2,700                                   |              |
| Telephone/Processor/<br>Electrowriter |             | +216       | 216                                       |              |
| Maintenance                           |             |            | 1,260                                     |              |
| Spares                                |             |            | + 90                                      |              |
| Total                                 | \$ 0        | \$486      | \$4,266                                   | \$ 0         |

<sup>1/</sup> 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.

<sup>2/</sup> Related distance.

#### 9. 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 observing 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)\*

|                                                          | <u>FAA and NWS Observation Stations<br/>(Except Contract Basic Stations)</u> |         | <u>SAWS and Contract Basic Stations</u> |         |
|----------------------------------------------------------|------------------------------------------------------------------------------|---------|-----------------------------------------|---------|
| Building:                                                |                                                                              |         |                                         |         |
| Equipment Space (Sq. Ft.)                                | 80                                                                           |         |                                         | 48      |
| Observer Space                                           | 150                                                                          |         | 80                                      |         |
| Fraction of Time Devoted to<br>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<br>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)**

| Facilities and Equipment                            | Automated<br>System/<br>Observer | Manual Systems |           |           |             |           | Non-Govt. |
|-----------------------------------------------------|----------------------------------|----------------|-----------|-----------|-------------|-----------|-----------|
|                                                     |                                  | FNA            |           | NWS       |             |           |           |
|                                                     |                                  | ATCT           | FSS       | Observer  | WECMO       | Contract  |           |
|                                                     |                                  |                |           |           |             | Basic     |           |
| 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 Factor 2/<br>Total (15 Years) | \$ 78,380                        | x 7,976        | x 7,976   | x 7,976   | x 7,976     | x 7,976   | x 7,976   |
| Total Life-Cycle Cost                               | \$165,268                        | \$559,807      | \$562,037 | \$562,699 | \$943,728   | \$278,721 | \$186,894 |
| Relative Population of Acceptable<br>Alternatives   |                                  | \$719,157      | \$621,387 | \$622,049 | \$1,003,078 | \$287,134 | \$189,269 |
| Contribution to Weighted Total                      |                                  | x .25          | x .36     | x .37     | x .02       |           |           |
| Weighted Total                                      |                                  | \$179,789      | \$223,699 | \$230,158 | \$ 20,062   |           |           |
| Typical Parameters                                  |                                  |                |           |           | \$653,708   |           |           |
| Wind Direction and Speed                            | X                                | X              | X         | X         | X           | X         | X         |
| Ambient Temperature and Dew Point                   | X                                | X              | X         | X         | X           | X         | X         |
| Altitude:                                           |                                  |                |           |           |             |           |           |
| Dual Altitude Setting Indicators                    | X                                | X              | X         | X         | X           |           | X         |
| Altitude Setting Indicator                          |                                  |                |           |           |             |           |           |
| Station Pressure                                    |                                  |                |           |           |             |           |           |
| Visibility                                          |                                  |                |           |           |             |           |           |
| Ceiling:                                            |                                  |                |           |           |             |           |           |
| Laser Cellometer                                    | X                                | X              | X         | X         | X           | X         |           |
| Sight Clinometer & Ceiling Light                    | X                                | X              | X         | X         | X           |           |           |
| Liquid Precipitation Quantity                       | X                                | X              | X         | X         | X           |           | X         |
| Signal Conditioning Equipment                       | X                                | X              | X         | X         | X           |           |           |
| Display Terminal                                    | 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 AWS installations. Controller input for these and other present weather data are included in the cost of observation personnel.

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 including costs of observation personnel for AWOS and excluding 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<br>System | FAA       |           | NWS       |           |
|-----------------------------------------------------|---------------------|-----------|-----------|-----------|-----------|
|                                                     |                     | ATCT      | FSS       | Observer  | WSMO      |
| 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<br>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 sensing 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).<sup>\*</sup> 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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<sup>\*</sup>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                     |                       |                                         |                            |
|-----------------------------|----------------------------------------|-----------------------------------------------|---------------------------|-----------------------|-----------------------|---------------------------|----------------------------------------|-----------------------|-----------------------------------------|----------------------------|
|                             | Ops. <sup>1</sup> / <sub>100,000</sub> | Hours Flown <sup>2</sup> / <sub>100,000</sub> | No. 3/ <sub>100,000</sub> | Per Mil-<br>lion Ops. | Per Mil-<br>lion Hrs. | No. 3/ <sub>100,000</sub> | Accident Rate<br>Per Mil-<br>lion Ops. | Per Mil-<br>lion Hrs. | No. 3/ <sub>100,000</sub>               | Fatalities<br>Per Accident |
| 1970                        | 113.3                                  | 26.030                                        | 4,712                     | 41.584/               | 180.984/              | 641                       | 5.654/                                 | 24.594/               | 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                     | 35.864/               | 157.674/              | 695                       | 5.834/                                 | 25.654/               | 1,426 <sup>5</sup> / <sub>100,000</sub> | 2.05                       |
| 1973                        | 122.2                                  | 29.974                                        | 4,255                     | 34.804/               | 141.894/              | 723                       | 5.904/                                 | 24.054/               | 1,412                                   | 1.95                       |
| 1974                        | 126.8                                  | 31.413                                        | 4,425                     | 34.884/               | 140.804/              | 729                       | 5.734/                                 | 23.144/               | 1,438                                   | 1.97                       |
| 1975                        | 134.2                                  | 32.024                                        | 4,237                     | 31.564/               | 132.244/              | 675                       | 5.014/                                 | 21.024/               | 1,345                                   | 1.99                       |
| 1976                        | 138.5                                  | 33.922                                        | 4,193                     | 30.254/               | 123.494/              | 695                       | 4.994/                                 | 20.374/               | 1,320                                   | 1.90                       |
| 1977                        | 142.8                                  | 35.792                                        | 4,286                     | 30.004/               | 119.784/              | 702                       | 4.914/                                 | 19.594/               | 1,436                                   | 2.05                       |
| 1978                        | 147.0                                  | 39.409                                        | 4,494                     | 26.984/               | 113.984/              | 793                       | 4.754/                                 | 20.074/               | 1,770 <sup>5</sup> / <sub>100,000</sub> | 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                     | 33.494/               | 138.58                | 699                       | 5.334/                                 | 22.00                 | 1,418                                   | 2.03                       |
| Std.<br>Dev.                | -                                      | -                                             | 214                       | 5.484/                | 28.68                 | 42                        | 0.56                                   | 3.24                  | 132                                     | 0.09                       |
| Annual<br>Rate of<br>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

| Year                        | GA Activity (Millions)<br>Aircraft Hours<br>Ops. 1/ Flom 2/ | Total GA Accidents | Fatal GA Accidents    |                       |                                      |
|-----------------------------|-------------------------------------------------------------|--------------------|-----------------------|-----------------------|--------------------------------------|
|                             |                                                             | No. 3/             | Accident Rate         |                       | Fatalities<br>No. 3/<br>Per Accident |
|                             |                                                             |                    | Per Mil-<br>lion Ops. | Per Mil-<br>lion Hrs. |                                      |
| 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.<br>Dev.                | - -                                                         | 47                 | 1.09                  | 6.23                  | 24 .22 1.32 56 .06                   |
| Annual<br>Rate of<br>Change | .0327 .0583                                                 | .0168              | -.0480                | -.0708                | .0138 -.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  |       | 1976  |       | 1977  |       | 1978  |       | 1979  |       | Total, 1975-1979 |        |        |        |
|--------------------------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|------------------|--------|--------|--------|
|                                                        | C     | F     | C     | F     | C     | F     | C     | F     | C     | F     | C                | F      | A      | A      |
| 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   | 1     | 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 aleet, 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               | 10.61  | 81     | 1.85   |
| 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 revision. 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 sensing 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:

|                                                        |                                                                                   |   |                                                                                    |
|--------------------------------------------------------|-----------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------|
| Preventable<br>Accident Rate =<br>Per Activity<br>Unit | No. of WX-Related<br>Approach/Landing<br>Accidents w/o WX<br>Observations in 1979 | - | No. of WX-Related<br>Approach/Landing<br>Accidents with WX<br>Observations in 1979 |
|                                                        | Activity without Weather Observations                                             |   | 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*<br>(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.<br>(Reference 19)                                    |                                                                        | <u>144,640,000</u>                         |
| Mean                                                               |                                                                        | 151,440,000                                |

\*155,600,000 operations in CY 1978 (per Reference 9)  $\times$  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 <sup>1/</sup> |            | Percent   |             | Adjusted to Enter        |                          |
|--------------------------------------------------------------------------------------------------------------|-----------------------------|------------|-----------|-------------|--------------------------|--------------------------|
|                                                                                                              | Local                       | Itinerant  | 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 | 66.03     | 70,705,272  | 45,925,093 <sup>2/</sup> | 79,945,176 <sup>4/</sup> |
| Airports Other Than Above                                                                                    | 42,341,634                  | 20,892,670 | 33.97     | 63,234,304  | 23,625,313 <sup>3/</sup> | 71,494,824 <sup>5/</sup> |
| Total                                                                                                        | 72,428,922                  | 61,510,654 | 100.00    | 133,939,576 | 69,547,580               | 151,440,000              |

<sup>1/</sup>Source: Reference 22.

<sup>2/</sup>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.

<sup>3/</sup>20,892,670 x (151,440,000/133,939,576). Rounded to 23,630,000 in the ensuing analysis.

<sup>4/</sup>52,798 x 151,440,000 (from Figure 21).

<sup>5/</sup>47,214 x 151,440,000 (from Figure 21).

FIGURE 23

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

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

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

<sup>2/</sup>Source: Reference 23 and 24.

<sup>3/</sup>Source: References 23, 24, and 25.

<sup>4/</sup>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  $((120.5 \times 9/12) + (126.6 \times 3/12))/120.5$ .

<sup>5/</sup>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<sub>GA</sub> 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:

$$AIA_{GA} = \frac{GATN}{2} \times (PIFR - PC) \times (.8 - .5R)$$

where

GATN is the number of annual general aviation itinerant operations,

PIFR 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),

PC 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 (PIFR - PC) 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 PIFR and PC. 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 PC and the VFR minimum ceiling of 1500 feet and visibility of 3 miles yields a value of 13.50 percent for PIFR. 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<sub>CA</sub> would equal zero since P<sub>C</sub> would equal P<sub>IFR</sub>.

FIGURE 24

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

| Ceiling<br>(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:

$$\begin{aligned}
 & .865 \times 10^{-4} \text{ per AIA} \\
 & = .865 \times 10^{-4} \text{ per } ((\text{GAITN}/2) \times (\text{PIFR} - \text{PC}) \times (.8 - .5R)) \\
 & = .865 \times 10^{-4} \text{ per } ((\text{GAITN}/2) \times (.1350 - .0495) \times (.8 - .5(.85))) \\
 & = 1.387 \times 10^{-4} \text{ per GAITN}
 \end{aligned}$$

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 Accidents/<br>W/O WX With WX |         | CA Activity (000) 2/<br>W/O WX With WX |            | Accident Rate W/O WX<br>Observ. (x 10 <sup>-6</sup> ) Per<br>Itin. Opn. Local Opn. 3/ |         | Accident Rate With WX<br>Observ. (x 10 <sup>-6</sup> ) Per<br>Itin. Opn. 4/ Local Opn. 3/ |         | Difference x 10 <sup>-6</sup> Per<br>Itin. Opn. Local Opn. |         |
|---------------------------------------|-------------------------------------|---------|----------------------------------------|------------|---------------------------------------------------------------------------------------|---------|-------------------------------------------------------------------------------------------|---------|------------------------------------------------------------|---------|
|                                       | Observ.                             | Observ. | Observ.                                | Observ.    | Observ.                                                                               | Observ. | Observ.                                                                                   | Observ. | Observ.                                                    | Observ. |
| Unfavorable Winds<br>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                | 255/                                | 275/    | 158 AIA                                | 962 AIA    | .169                                                                                  | .101    | .056                                                                                      | .034    | 1.3876/                                                    | -       |
| Rain, Hydroplaning<br>or Wet Runway   | 4                                   | 1       | 23,630 ITN                             | 45,930 ITN | .085                                                                                  | .051    | .034                                                                                      | .017    | .113                                                       | .067    |
| Thunderstorms                         | 2                                   | 1       | 23,630 ITN                             | 45,930 ITN |                                                                                       |         |                                                                                           |         |                                                            |         |

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 existence 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 conceptually 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 Occurring in CY 1979 For Which Cause(s)/Factor(s) Were Cited Which Are Detectable/Measurable By ANOS (Thousands of 1981 Dollars)

| Cause/Factor                         | Personal Injuries |         |       | Aircraft Damage      |                        |                 | Total Accident Costs |
|--------------------------------------|-------------------|---------|-------|----------------------|------------------------|-----------------|----------------------|
|                                      | Fatal             | Serious | Minor | No. Destroyed x \$50 | No. Substantial x \$16 | No. Minor x \$2 |                      |
| Unfavorable Winds or Wrong Runway    | 8                 | 18      | 47    | \$ 4,640             | \$ 756                 | \$ 752          | \$ 9,498             |
| Temperature/Dew Point                | 0                 | 0       | 4     | 0                    | 0                      | 64              | 176                  |
| Low Ceiling/Visibility <sup>1/</sup> | 63                | 25      | 17    | 36,540               | 1,050                  | 272             | 39,884               |
| Rain, Hydroplaning or Wet Runway     | 0                 | 2       | 0     | 0                    | 84                     | 0               | 198                  |
| Thunderstorms                        | 0                 | 0       | 1     | 0                    | 0                      | 16              | 64                   |
| Totals                               | 71                | 45      | 69    | \$41,180             | \$1,890                | \$1,104         | \$49,820             |

<sup>1/</sup>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.

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

<sup>3/</sup>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

| <u>Weather Phenomenon</u>          | <u>Expected Preventable Accident Rate (x10<sup>-6</sup>)<sup>1/</sup></u><br><u>Per Itinerant Operation Per Local Operation</u> | <u>Expected Cost Per Accident<sup>2/</sup></u> | <u>Expected Benefit Per Itin. Opn.</u> | <u>Local Opn</u> |
|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|----------------------------------------|------------------|
| Unfavorable Winds and Wrong Runway | 3.704                                                                                                                           | \$53,000                                       | \$ .1963                               | \$ .1178         |
| Temperature/Dew Point              | .101                                                                                                                            | 25,000                                         | .0025                                  | .0015            |
| Low Ceiling/Visibility             | 1.387                                                                                                                           | 767,000                                        | 1.064                                  | -                |
| Rain, Hydroplaning or Wet Runway   | .113                                                                                                                            | 40,000                                         | .0045                                  | .0027            |
| Thunderstorms                      | .029                                                                                                                            | 21,000                                         | .0007                                  | .0004            |

<sup>1/</sup>From Figure 25.

<sup>2/</sup>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:

- o 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.
- o 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.

- o 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 transportation 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,

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

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

|                                                  |          |        |
|--------------------------------------------------|----------|--------|
| Equipment <sup>1/</sup>                          | \$ 1,900 |        |
| Initial Spares <sup>1/</sup>                     | + 475    |        |
| Total                                            | \$ 2,375 |        |
| Life-Cycle Capital Recovery Factor <sup>2/</sup> | x .13147 | \$ 312 |

Operations and Maintenance Costs<sup>1/</sup>

|                           |              |              |
|---------------------------|--------------|--------------|
| Personnel                 |              |              |
| Observation <sup>3/</sup> | \$ 7,056     |              |
| Maintenance               | 216          |              |
| Spares Inventory          | 228          |              |
| Communications            | 0            |              |
| Facilities                | <u>1,736</u> | <u>9,236</u> |

Annualized Cost \$9,548

<sup>1/</sup>From Figure 16.

<sup>2/</sup>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.

<sup>3/</sup>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 approaches 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  $P_{IFR}$ ,  $P_C$  and  $R$ ,  $AIA_{CA}$  can be solved as follows:

$$\begin{aligned} AIA_{CA} &= (GAITN/2) \times (.1350 - .0495) \times (.8 - .5 (.85)) \\ &= .0160 \times GAITN \end{aligned}$$

Note that if a candidate site doesn't have an approved instrument approach procedure (SIAP),  $AIA_{CA}$  would by definition be equal to zero because  $P_C$  would equal  $P_{IFR}$ . 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) Probability of Averting a Disruption ( $PAIFD$ )

The probability of avoiding an instrument flight disruption ( $PAIFD$ ) 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,  $PAIFD$  can be expressed as:

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

Substituting the values from Figure 24 yields:

$$\begin{aligned} PAIFD &= \frac{4.95\% - 4.10\%}{13.50\% - 4.95\%} \\ &= \frac{0.85\%}{8.55\%} \\ &= .10 \end{aligned}$$

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 (CIFD)

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

|              | <u>Cost Equation</u>                  | <u>Weight</u> |
|--------------|---------------------------------------|---------------|
| Delay        | $(0.5 V_{PT})n + 0.30 AOC_4$          | 0.38          |
| Cancellation | $2 V_{PT} n$                          | 0.55          |
| Diversion    | $(2.0 V_{PT} + V_{DVG})n + 1.5 AOC_4$ | <u>0.07</u>   |
|              |                                       | 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        | $\$48.00 \times 0.38 = 18.24$              |
| Cancellation | $\$91.20 \times 0.55 = 50.16$              |
| Diversion    | $\$344.40 \times 0.07 = \underline{24.11}$ |
|              | \$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:

$$\begin{aligned}
 AB_{AIFD} &= AN_{AIFD} \times CIFD \\
 &= AIA_{GA} \times PA_{IFD} \times CIFD \\
 &= .0160 \times GA_{ITN} \times .10 \times \$93 \\
 &= GA_{ITN} \times \$1.488
 \end{aligned}$$

## (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 ( $G_{ITN}$ ), 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:

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

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 ( $.0160 \times 2$ ) 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 ( $F_0$ )

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 ( $F_0$ ). 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 ( $F_0$ ) is:

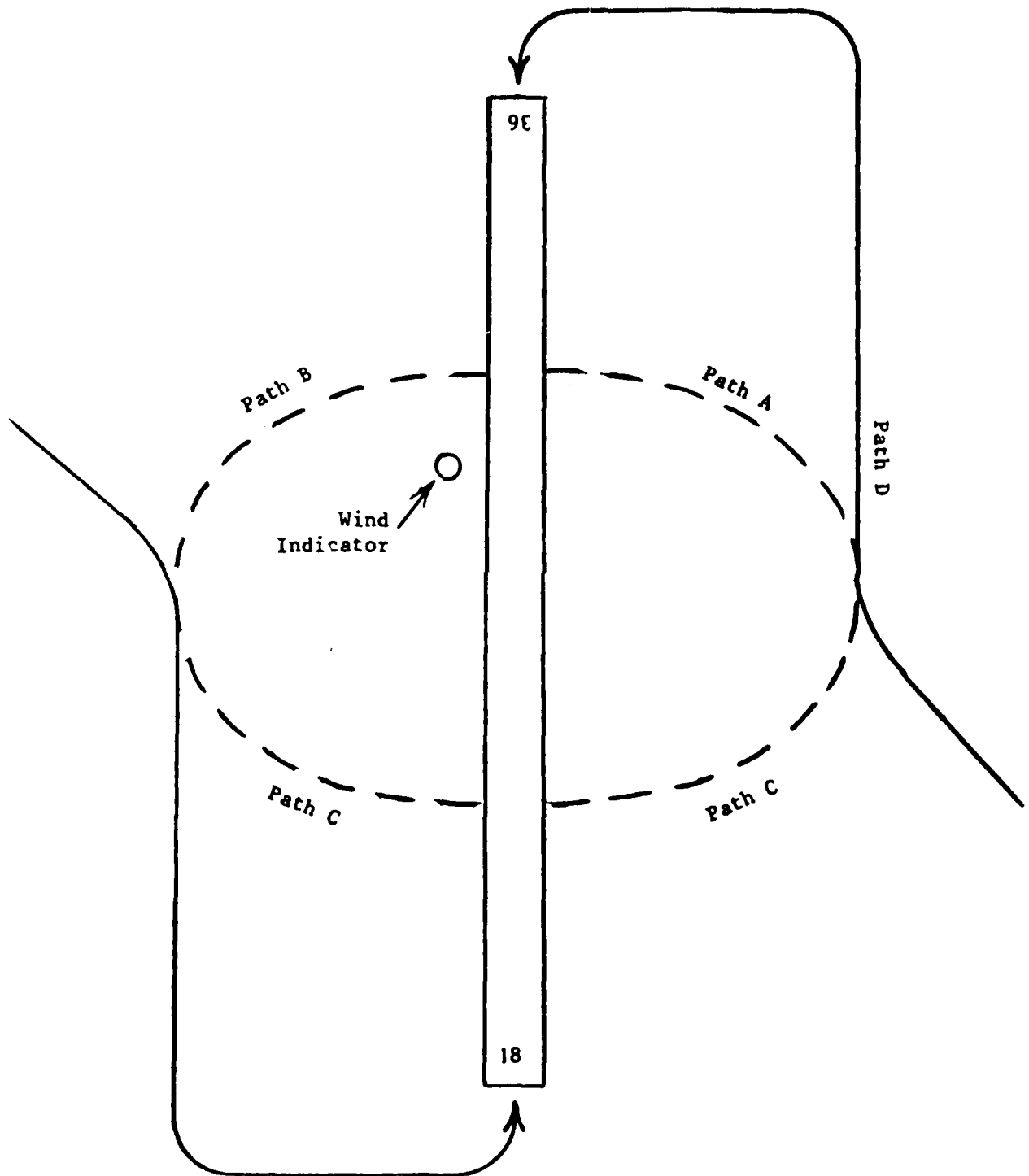
$$F_0 = (1.00 - 0.11 - .24) \times 0.30 \\ = 0.195$$

(iv) Unit Cost of a Disruption ( $C_{AD}$ )

Figure 29 illustrates a typical one-runway airport with a traffic pattern as recommended in Paragraph 223 of the Airman's Information Manual (Reference 33). 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) Summary

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

$$\begin{aligned} \text{ABAO} &= \text{ANAO} \times \text{CAO} \\ &= \text{GATN} \times \text{FA} \times \text{FVC} \times \text{FO} \times \text{CAO} \\ &= \text{GATN} \times 0.50 \times 0.968 \times 0.195 \times \$.70 \\ &= \text{GATN} \times \$.0661 \end{aligned}$$

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 GATN, and  
\$.0397 per GALCL

d. 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 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:

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

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

$$r = 45.34$$

$$2r = 90.68$$

1

FIGURE 30

Area Covered Per FAA/NWS Weather Observation Station

| FAA Region               | Square Miles <sup>1/</sup> | Number of Stations <sup>2</sup> |     |     |     | Total | Square Miles Per Station |
|--------------------------|----------------------------|---------------------------------|-----|-----|-----|-------|--------------------------|
|                          |                            | ATCT                            |     | FSS |     |       |                          |
|                          |                            | FAA                             | NWS | FAA | NWS |       |                          |
| 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                    |

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

<sup>2/</sup>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

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

1/Applies only to locations with actual or "would-be" standard instrument approach procedures.  
2/Adjusting Penalty or Premium Reciprocal:

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

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

where 'n' is each year of an assumed economic life of 15 years, ACITN and ATTN 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  $3,000/(\$9,548 \times 7.976)$ . 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  $\$1:((1+i)^n-1)/i(1+i)^n$  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/<br>(Lesser of (ACITN+ATITN) or (3,000)) x \$9,548<br>3,000 | Life-Cycle Benefits<br>Inflator | Product or<br>Quotient |
|--------------------------------|---------------------------------------------------------------------------------------|---------------------------------|------------------------|
| Air Carrier and Air Taxi       |                                                                                       | 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

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

1/Source: Figure 31

2/Adjustment Reciprocal (AR):

- 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.
- 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 contract surface weather observation station.
- Adjustment reciprocal for other candidate airports = 1.

FIGURE 33

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

| <u>User Class</u>                    | <u>Airports With Existing<br/>Standard Instrument Approach<br/>Procedures (SIAP) or With<br/>Prospective SIAP With AWOS</u> |                                                     | <u>Other Non-Towered and Non-Federal<br/>Towered Airports</u> |  | <u>Product</u> |
|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|---------------------------------------------------------------|--|----------------|
|                                      | <u>Lesser of (ACTN+ATTN) or (3,000)<br/>\$ .0394</u>                                                                        | <u>(Lesser of (ACTN+ATTN) or (3,000)) x \$25.38</u> |                                                               |  |                |
| <u>General Aviation and Military</u> |                                                                                                                             |                                                     |                                                               |  |                |
| Wind Sensor                          | \$ 3.80x (GATN+MLITN) +\$2.28x (GALCL+MLLCL)                                                                                | \$3.80x (GATN+MLITN) +\$2.28x (GALCL+MLLCL)         |                                                               |  | - \$xxxx       |
| Temperature/Dew Point Sensors        | \$ .04x (GATN+MLITN) +\$ .02x (GALCL+MLLCL)                                                                                 | \$ .04x (GATN+MLITN) +\$ .02x (GALCL+MLLCL)         |                                                               |  | - \$xxxx       |
| Altitude Sensor                      | \$ 2.16x (GATN+MLITN)                                                                                                       | \$0.00x (GATN+MLITN)                                |                                                               |  | - \$xxxx       |
| Ceiling/Visibility Sensors           | \$15.43x (GATN+MLITN)                                                                                                       | \$0.00x (GATN+MLITN)                                |                                                               |  | - \$xxxx       |
| Precipitation Sensor (s)             | \$ .06x (GATN+MLITN) +\$ .04x (GALCL+MLLCL)                                                                                 | \$ .06x (GATN+MLITN) +\$ .04x (GALCL+MLLCL)         |                                                               |  | - \$xxxx       |
| Thunderstorm Sensor                  | \$ .01x (GATN+MLITN) +\$ .01x (GALCL+MLLCL)                                                                                 | \$ .01x (GATN+MLITN) +\$ .01x (GALCL+MLLCL)         |                                                               |  | - \$xxxx       |

Phase I Value

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

(Sum of Applicable Benefits x AR  
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 thunderstorms, 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 suppression 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<br>SAFETY<br>BENS | LC<br>EFFCY<br>BENS | GA+MI<br>AIA'S<br>YR 1 | PHASE<br>I B/C# | PHASE<br>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            | BIT   | 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            | SNK   | 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 | 52198.               | 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            | SKE   | KETCHIKAN HARBOR         | KETCHIKAN             | AK | 26561.               | 114066.             | 0.                     | 0.75            | 0.94            |
| AAL            | MTF   | METRO FLD                | FAIRBANKS             | AK | 41641.               | 94627.              | 0.                     | 0.67            | 0.91            |
| AAL            | Z20   | 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            | 522   | 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 | RDV  | RED DEVIL          | AK | 5247.  | 57431. | 0.  | 0.23  | 0.42  |
| AAL | AK86 | NAPAKIAK           | AK | 1499.  | 62139. | 0.  | 0.21  | 0.42  |
| AAL | ELI  | ELIM               | AK | 1460.  | 58017. | 0.  | 0.22  | 0.40  |
| AAL | MHM  | MINCHUMINA         | AK | 2921.  | 3212.  | 0.  | 0.40  | 0.40  |
| AAL | Z10  | KONGIGANAK         | AK | 3503.  | 55852. | 0.  | 0.22  | 0.40  |
| AAL | PSG  | PETERSBURG         | AK | 1513.  | 57663. | 0.  | 0.31  | 0.39  |
| AAL | KLK  | KALSKAG            | AK | 1567.  | 57733. | 0.  | 0.25  | 0.39  |
| AAL | RSH  | RUSSIAN MISSION    | AK | 2508.  | 54768. | 0.  | 0.22  | 0.38  |
| AAL | AK85 | KWIGILLINGOK       | AK | 1460.  | 56195. | 0.  | 0.20  | 0.38  |
| AAL | DKK  | DAHL CREEK         | AK | 585.   | 5910.  | 0.  | 0.19  | 0.37  |
| AAL | KLL  | LEVELOCK           | AK | 2594.  | 52447. | 0.  | 0.22  | 0.37  |
| AAL | AK87 | NEWTOK             | AK | 438.   | 55862. | 0.  | 0.19  | 0.37  |
| AAL | LNI  | LONELY DEW STATION | AK | 43417. | 11281. | 18. | 0.33* | 0.36* |
| AAL | KNJ  | NEW STUYAHOK       | AK | 2045.  | 48030. | 0.  | 0.21  | 0.33  |
| AAL | WKK  | ALEKNAGIK          | AK | 3180.  | 46961. | 0.  | 0.20  | 0.33  |
| AAL | BLG  | BELUGA             | AK | 14769. | 32704. | 0.  | 0.23  | 0.32  |
| AAL | SHG  | SHUNGNAK           | AK | 457.   | 46098. | 0.  | 0.19  | 0.31  |
| AAL | DUT  | DUTCH HARBOR       | AK | 349.   | 46269. | 2.  | 0.21  | 0.31  |
| AAL | 225  | CHENA RIVER        | AK | 16410. | 30015. | 0.  | 0.23  | 0.31  |
| AAL | SMK  | ST MICHAEL         | AK | 1134.  | 45550. | 0.  | 0.18  | 0.31  |
| AAL | SDP  | SAND POINT         | AK | 2548.  | 42884. | 0.  | 0.20  | 0.30  |
| AAL | KGK  | NEW KOLIGANEK      | AK | 1752.  | 41313. | 0.  | 0.16  | 0.29  |
| AAL | MDR  | MEDFRA             | AK | 1451.  | 42215. | 0.  | 0.15  | 0.29  |
| AAL | KKU  | EKUK               | AK | 2508.  | 40287. | 0.  | 0.17  | 0.28  |
| AAL | CDL  | CANDLE             | AK | 9372.  | 39988. | 0.  | 0.15  | 0.27  |
| AAL | Z03  | EGEGIK /NEW/       | AK | 877.   | 30943. | 0.  | 0.18  | 0.27  |
| AAL | EAA  | EAGLE              | AK | 4885.  | 35434. | 0.  | 0.17  | 0.27  |
| AAL | 17Z  | MANOKOTAK          | AK | 585.   | 39142. | 0.  | 0.13  | 0.26  |
| AAL | PKA  | NAPAISSAK          | AK | 876.   | 37492. | 0.  | 0.14  | 0.25  |
| AAL | VAK  | CHEVAK             | AK | 876.   | 36070. | 0.  | 0.15  | 0.25  |
| AAL | 95Z  | BRADLEY SKY-RANCH  | AK | 4497.  | 32292. | 0.  | 0.14  | 0.24  |
| AAL | 51Z  | MINTO /NEW/        | AK | 6357.  | 29959. | 0.  | 0.15  | 0.24  |
| AAL | Z74  | CHEFORNAK          | AK | 1460.  | 33919. | 0.  | 0.12  | 0.24  |
| AAL | SKK  | SHAKTOOLIK         | AK | 291.   | 36082. | 0.  | 0.15  | 0.24  |
| AAL | KEB  | ENGLISH BAY        | AK | 1896.  | 34062. | 0.  | 0.13  | 0.24  |
| AAL | 4Z4  | HOLY CROSS         | AK | 462.   | 33594. | 0.  | 0.12  | 0.23  |
| AAL | OBU  | KOBUK /WIEN/       | AK | 5247.  | 29458. | 0.  | 0.15  | 0.23  |
| AAL | Z60  | AMBLER             | AK | 5515.  | 29684. | 0.  | 0.14  | 0.23  |
| AAL | WBQ  | BEAVER             | AK | 1460.  | 31916. | 0.  | 0.14  | 0.22  |
| AAL | SVS  | STEVENS VILLAGE    | AK | 1460.  | 30125. | 0.  | 0.13  | 0.21  |
| AAL | AIN  | WAINWRIGHT         | AK | 1776.  | 29743. | 2.  | 0.13* | 0.21* |
| AAL | CXC  | CHITINA            | AK | 3114.  | 28901. | 0.  | 0.12  | 0.21  |
| AAL | AK54 | TELLER             | AK | 2508.  | 28703. | 0.  | 0.12  | 0.21  |
| AAL | AK04 | PEDRO BAY          | AK | 1607.  | 28408. | 0.  | 0.11  | 0.20  |
| AAL | ANV  | ANVIK              | AK | 1806.  | 28474. | 0.  | 0.11  | 0.20  |
| AAL | AKP  | ANAKTUVUK PASS     | AK | 1460.  | 28363. | 0.  | 0.11  | 0.20  |
| AAL | 5NN  | NONDALTON          | AK | 2067.  | 28559. | 0.  | 0.11  | 0.20  |
| AAL | KFP  | FALSE PASS         | AK | 1607.  | 28408. | 0.  | 0.11  | 0.20  |
| AAL | KCL  | CHIGNIK LAGOON     | AK | 1630.  | 28416. | 0.  | 0.11  | 0.20  |
| AAL | 15Z  | MCCARTHY NR 2      | AK | 2033.  | 23548. | 0.  | 0.11  | 0.20  |
| AAL | TKJ  | TOK                | AK | 1686.  | 28435. | 0.  | 0.11  | 0.20  |
| AAL | CYT  | YAKATAGA           | AK | 1633.  | 28424. | 0.  | 0.11  | 0.20  |
| AAL | Z46  | MEADE RIVER        | AK | 89.    | 27913. | 0.  | 0.09  | 0.19  |
| AAL | PGM  | PORT GRAHAM        | AK | 585.   | 28075. | 0.  | 0.10  | 0.19  |
| AAL | AK10 | PILOT STATION      | AK | 585.   | 28077. | 0.  | 0.10  | 0.19  |
| AAL | AK79 | CHIGNIK LAKE       | AK | 620.   | 28087. | 0.  | 0.10  | 0.19  |
| AAL | RMP  | RAMPART            | AK | 730.   | 23666. | 0.  | 0.12  | 0.19  |
| AAL | SRV  | STONY RIVER 2      | AK | 0.     | 23122. | 0.  | 0.10  | 0.19  |
| AAL | SLQ  | SLEETMUTE          | AK | 438.   | 27884. | 0.  | 0.09  | 0.19  |
| AAL | CIK  | CHALKYITSIK        | AK |        | 26674. | 0.  | 0.11  | 0.18  |

|     |      |                       |                    |    |        |        |    |       |       |
|-----|------|-----------------------|--------------------|----|--------|--------|----|-------|-------|
| AAL | KYT  | 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 | Z74  | PHLOS                 | WASILLA            | AK | 4149.  | 19849. | 0. | 0.10  | 0.16  |
| AAL | LS   | STEBBINS              | STEBBINS           | AK | 291.   | 23742. | 0. | 0.10  | 0.16  |
| AAL | LS   | LOST RIVER 1          | LOST RIVER         | AK | 291.   | 22341. | 0. | 0.08  | 0.15  |
| AAL | SQL  | THE QUEENS            | QUEENS             | AK | 1607.  | 17283. | 0. | 0.07  | 0.13  |
| AAL | KTS  | TRILLIS 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  | LAKA 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. | 0.06  | 0.10  |
| AAL | SKW  | SKWENTNA              | SKWENTNA           | AK | 5501.  | 8043.  | 5. | 0.07  | 0.09  |
| AAL | KVC  | KING COVE             | KING COVE          | AK | 876.   | 11727. | 0. | 0.04* | 0.09* |
| AAL | TLT  | TULUKSAK              | TULUKSAK           | AK | 673.   | 12099. | 0. | 0.05  | 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  | KLAUOCK               | KLAUOCK            | AK | 1460.  | 6017.  | 0. | 0.03  | 0.05  |
| AAL | STE  | 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 | PCX  | 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 | IA | 1093963. | 190760. | 1082. | 7.02* | 8.54* |
| ACE | MCW | MASON CITY MUNI     | IA | 991968.  | 264500. | 953.  | 4.30  | 8.35  |
| ACE | AMJ | AMES MUNI           | IA | 937027.  | 268726. | 927.  | 7.31  | 8.01  |
| ACE | OTM | OTTUMWA INDUSTRIAL  | IA | 814347.  | 233856. | 785.  | 3.36  | 6.96  |
| ACE | BRL | BURLINGTON MUNI     | IA | 694590.  | 216965. | 693.  | 3.81  | 6.05  |
| ACE | FOD | FORT DODGE MUNI     | IA | 579880.  | 199874. | 556.  | 2.76  | 5.18  |
| ACE | MIW | MARSHALLTOWN MUNI   | IA | 566626.  | 157029. | 745.  | 3.73  | 4.81  |
| ACE | SPW | SPENCER MUNI        | IA | 491987.  | 186102. | 500.  | 3.20  | 4.51  |
| ACE | CWI | CLINTON MUNI        | IA | 404627.  | 173914. | 364.  | 2.91  | 3.84  |

|     |     |                          |    |        |        |     |       |       |
|-----|-----|--------------------------|----|--------|--------|-----|-------|-------|
| ACE | MUT | MUSCATINE                | IA | 350985 | 96147  | 351 | 2.54  | 2.97  |
| ACE | TNU | NEWTON                   | IA | 329095 | 96207  | 337 | 2.14  | 2.83  |
| ACE | CAV | CLARION                  | IA | 296638 | 89439  | 296 | 2.07* | 2.57* |
| ACE | CNC | CHARITON                 | IA | 290042 | 69866  | 271 | 1.89* | 2.32* |
| ACE | ICL | CLARINDA                 | IA | 272678 | 69164  | 275 | 1.95* | 2.27* |
| ACE | AXA | ALGONA                   | IA | 189261 | 145121 | 143 | 1.92  | 2.22  |
| ACE | IOW | IOWA CITY MUNICIPAL      | IA | 179542 | 148547 | 651 | 3.91  | 2.18  |
| ACE | SRK | SPIRIT LAKE MUNI         | IA | 188507 | 137302 | 190 | 1.68* | 2.16* |
| ACE | OXV | KNOXVILLE MUNI           | IA | 227448 | 50572  | 220 | 1.60  | 1.85  |
| ACE | K27 | FORT MADISON MUNI        | IA | 132174 | 128165 | 131 | 1.30* | 1.73* |
| ACE | AID | ATLANTIC MUNI            | IA | 145551 | 105079 | 121 | 1.56  | 1.67  |
| ACE | RDK | RED OAK MUNICIPAL        | IA | 195266 | 46647  | 178 | 2.06  | 1.61  |
| ACE | EBS | WEBSTER CITY MUNI        | IA | 180943 | 61610  | 182 | 1.23  | 1.61  |
| ACE | BNW | BOONE MUNI               | IA | 175311 | 64556  | 157 | 2.11  | 1.59  |
| ACE | SHL | SHELDON MUNI             | IA | 165485 | 73220  | 160 | 1.24  | 1.59  |
| ACE | DEH | DECORAH MUNI             | IA | 145057 | 72781  | 148 | 1.05  | 1.45  |
| ACE | CCY | CHARLES CITY MUNI        | IA | 130971 | 65947  | 126 | 0.99  | 1.45  |
| ACE | C23 | MAQUOKETA MUNI           | IA | 147657 | 64538  | 141 | 1.10* | 1.41* |
| ACE | ADU | AUDUBON MUNI             | IA | 89591  | 21532  | 84  | 1.30  | 1.40  |
| ACE | MXO | MONTICELLO MUNICIPAL     | IA | 157304 | 52556  | 157 | 1.11* | 1.39* |
| ACE | SLB | STORM LAKE MUNI          | IA | 161987 | 36789  | 154 | 1.20  | 1.32  |
| ACE | EST | ESTHERVILLE MUNI         | IA | 137660 | 55088  | 132 | 1.00  | 1.28  |
| ACE | LRJ | LEMARS MUNI              | IA | 158809 | 32630  | 144 | 1.66  | 1.27  |
| ACE | EFW | JEFFERSON MUNI           | IA | 135739 | 50718  | 123 | 1.34  | 1.24  |
| ACE | ORC | ORANGE CITY MUNI         | IA | 125467 | 53346  | 118 | 0.99  | 1.19  |
| ACE | DNS | DENISON MUNI             | IA | 134611 | 40414  | 122 | 1.39  | 1.16  |
| ACE | POH | POCAHONTAS MUNI          | IA | 44755  | 119971 | 0   | 2.18  | 1.09  |
| ACE | IDG | IDA GROVE MUNI           | IA | 68060  | 67015  | 69  | 0.69* | 1.03* |
| ACE | PRO | PERRY MUNI               | IA | 121820 | 32505  | 135 | 1.06  | 1.03  |
| ACE | CSQ | CRESTON MUNI             | IA | 36363  | 11732  | 0   | 1.87  | 1.02  |
| ACE | EOK | KEOKUK MUNI              | IA | 34921  | 116761 | 0   | 0.87  | 1.01  |
| ACE | MEY | MAPLETON MUNI            | IA | 96011  | 51802  | 86  | 1.04  | 0.98  |
| ACE | CIN | ARTHUR N NEU             | IA | 29896  | 115121 | 0   | 1.62  | 0.96  |
| ACE | D34 | FOREST CITY MUNI         | IA | 27928  | 111688 | 0   | 1.54  | 0.93  |
| ACE | EQQ | EMMETSBURG MUNI          | IA | 33443  | 104906 | 113 | 1.08  | 0.92  |
| ACE | HNR | HARLAN MUNI              | IA | 72097  | 62041  | 241 | 1.70  | 0.89  |
| ACE | C25 | HAVERLY MUNI             | IA | 54540  | 71522  | 203 | 1.60  | 0.84  |
| ACE | OK9 | DELWEIN MUNI             | IA | 90809  | 35892  | 92  | 0.52  | 0.84  |
| ACE | MPZ | MT PLEASANT MUNI         | IA | 95617  | 27927  | 94  | 0.66  | 0.82  |
| ACE | SKI | SAC CITY MUNI            | IA | 102281 | 17776  | 95  | 0.62* | 0.80* |
| ACE | CRZ | CORNING MUNI             | IA | 101268 | 17444  | 96  | 0.65* | 0.79* |
| ACE | K21 | CENTERVILLE MUNI         | IA | 17221  | 100745 | 0   | 0.55  | 0.78  |
| ACE | SDA | SHENANDOAH MUNI          | IA | 82565  | 28888  | 73  | 0.82  | 0.74  |
| ACE | 3Y2 | GEORGE L SCOTT MUNI      | IA | 72818  | 34846  | 73  | 0.58* | 0.72* |
| ACE | SOY | SIoux CENTER MUNI        | IA | 24059  | 78507  | 0   | 0.49  | 0.68  |
| ACE | PEA | PELLA MUNI               | IA | 19029  | 82363  | 0   | 0.99  | 0.67  |
| ACE | K22 | CHEROKEE MUNI            | IA | 46087  | 49190  | 0   | 0.57  | 0.63  |
| ACE | 6C5 | INDEPENDENCE MUNI        | IA | 28988  | 60417  | 0   | 0.48  | 0.59  |
| ACE | FFL | FAIRFIELD MUNI           | IA | 42569  | 39327  | 0   | 1.68  | 0.54  |
| ACE | IFA | IOWA FALLS MUNI          | IA | 33647  | 37069  | 0   | 0.43  | 0.47  |
| ACE | 3Y3 | WINTERSET-MADISON COUNTY | IA | 40042  | 23939  | 0   | 0.44  | 0.43  |
| ACE | 00A | OSKALOOSA MUNI           | IA | 20053  | 31974  | 0   | 0.30  | 0.35  |
| ACE | 8C8 | FLYERS                   | IA | 40085  | 13083  | 0   | 0.40  | 0.35  |
| ACE | HFT | HAMPTON MUNICIPAL        | IA | 17304  | 32823  | 0   | 0.27  | 0.33  |
| ACE | C17 | MARION                   | IA | 34470  | 14070  | 0   | 0.37  | 0.32  |
| ACE | OK7 | HUMBOLDT MUNI            | IA | 29846  | 12559  | 0   | 0.32  | 0.28  |
| ACE | Y76 | NORTH FIELD /PVT/        | IA | 29539  | 9644   | 0   | 0.31  | 0.26  |
| ACE | K28 | GREENFIELD MUNI          | IA | 25089  | 13195  | 0   | 0.28  | 0.25  |
| ACE | 5C2 | ANTIQUE AIRFIELD         | IA | 26222  | 8559   | 0   | 0.26  | 0.23  |
| ACE | 4C8 | ALBIA MUNI               | 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 | 6C8 | HUSBAND FIELD                         | DALLAS CENTER          | IA | 20395.   | 7744.   | 0.   | 0.21  | 0.19   |
| ACE | 4K6 | NICHOLS                               | LA PORTE CITY          | IA | 21677.   | 7075.   | 0.   | 0.22  | 0.19   |
| ACE | D02 | BLOOMFIELD MUNI                       | BLOOMFIELD             | IA | 16043.   | 10534.  | 0.   | 0.18  | 0.18   |
| ACE | C61 | OSAGE MUNI                            | OSAGE                  | IA | 19077.   | 7841.   | 0.   | 0.20  | 0.18   |
| ACE | 1Y4 | WASHINGTON MUNI                       | WASHINGTON             | IA | 19070.   | 6224.   | 0.   | 0.20  | 0.17   |
| ACE | Y00 | NEVADA MUNI                           | NEVADA                 | IA | 17763.   | 7432.   | 0.   | 0.18  | 0.17   |
| ACE | K36 | ZANGGER                               | LARCHWOOD              | IA | 16235.   | 7474.   | 0.   | 0.17  | 0.16   |
| ACE | K35 | ONAMA MUNI                            | ONAMA                  | IA | 17324.   | 5654.   | 0.   | 0.17  | 0.15   |
| ACE | Y43 | MISSOURI VALLEY                       | MISSOURI VALLEY        | IA | 16784.   | 5478.   | 0.   | 0.17  | 0.15   |
| ACE | 0K4 | ANITA MUNI-KEVIN BURKE MEMORIAL FIELD | ANITA                  | IA | 15159.   | 4948.   | 0.   | 0.15  | 0.13   |
| ACE | 5C3 | EAGLE GROVE MUNI                      | EAGLE GROVE            | IA | 8531.    | 7791.   | 0.   | 0.11  | 0.11   |
| ACE | D03 | BEEDS LAKE                            | HAMPTON                | IA | 11631.   | 3796.   | 0.   | 0.12  | 0.10   |
| ACE | 2Y4 | SIBLEY MUNI                           | SIBLEY                 | IA | 8156.    | 6482.   | 0.   | 0.10  | 0.10   |
| ACE | 6C0 | ROCKWELL CITY MUNI                    | ROCKWELL CITY          | IA | 10625.   | 3468.   | 0.   | 0.11  | 0.09   |
| ACE | 1Y9 | ELDORA MUNI                           | ELDORA                 | IA | 8662.    | 7202.   | 0.   | 0.07  | 0.08   |
| ACE | K37 | PAULLINA MUNI                         | PAULLINA               | IA | 8412.    | 2827.   | 0.   | 0.09  | 0.08   |
| ACE | 8C4 | OSCEOLA MUNI                          | OSCEOLA                | IA | 9292.    | 3290.   | 0.   | 0.09  | 0.08   |
| ACE | 7C3 | MATHEWS MEMORIAL                      | TIPTON                 | IA | 9591.    | 3033.   | 0.   | 0.10  | 0.08   |
| ACE | 7C5 | MONONA MUNI                           | MONONA                 | IA | 6657.    | 3131.   | 0.   | 0.10  | 0.08   |
| ACE | 0Y0 | SIG FIELD                             | MONTEZUMA              | IA | 7144.    | 2173.   | 0.   | 0.07  | 0.06   |
| ACE | 0Y5 | GUTHRIE CENTER MUNI                   | GUTHRIE CENTER         | IA | 6073.    | 2332.   | 0.   | 0.07  | 0.06   |
| ACE | Y67 | NASH FIELD INDIANOLA                  | INDIANOLA              | IA | 6126.    | 3069.   | 0.   | 0.06  | 0.06   |
| ACE | K29 | ELLEN CHURCH FIELD                    | CRESO                  | IA | 5314.    | 2000.   | 0.   | 0.06  | 0.05   |
| ACE | C27 | GRINNELL                              | GRINNELL               | IA | 6015.    | 1963.   | 0.   | 0.06  | 0.05   |
| ACE | 0Y7 | MANCHESTER MUNI                       | MANCHESTER             | IA | 1843.    | 602.    | 0.   | 0.02  | 0.02   |
| ACE |     | LAMONI MUNICIPAL                      | LAMONI                 | IA |          |         |      |       |        |
| 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 | LBK | 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                          | WICHITA                | KS | 519681.  | 109632. | 519. | 3.55* | 4.18*  |
| ACE | EWK | NEWTON-CITY-COUNTY                    | AUGUSTA                | KS | 523942.  | 102422. | 446. | 4.05  | 4.16   |
| ACE | HYS | HAYS MUNI                             | NEWTON                 | KS | 331908.  | 164231. | 280. | 2.83  | 3.30   |
| ACE | WLD | STROTHER FIELD                        | HAYS                   | KS | 357800.  | 114482. | 342. | 3.38  | 3.14   |
| ACE | EMP | EMPORIA MUNI                          | WINFIELD/ARKANSAS CITY | KS | 401798.  | 68857.  | 330. | 2.32* | 3.13*  |
| ACE | FSK | FORT SCOTT MUNI                       | EMPORIA                | KS | 292003.  | 66607.  | 284. | 2.38  | 2.38   |
| ACE | PTS | ATKINSON MUNI                         | FORT SCOTT             | KS | 242665.  | 68405.  | 234. | 1.94  | 2.07   |
| ACE | CFV | COFFEYVILLE MUNI                      | PIITSBURG              | KS | 1743359. | 108004. | 161. | 1.74  | 1.83   |
| ACE | CNU | CHANUTE MARTIN JOHNSON                | CHANUTE                | KS | 179758.  | 96503.  | 181. | 1.40* | 1.84*  |
| ACE | CEA | CESSNA ACFT FIELD                     | WICHITA                | KS | 152274.  | 104463. | 223. | 1.50* | 1.78*  |
| ACE | IDP | INDEPENDENCE MUNI                     | I'DEPENDENCE           | KS | 102765.  | 138884. | 148. | 1.39  | 1.71   |
| ACE | GDD | GREAT BEND MUNI                       | GREAT BEND             | KS | 189702.  | 39820.  | 135. | 1.19* | 1.53*  |
| ACE | BEC | BEECH FACTORY                         | WICHITA                | KS | 160672.  | 32986.  | 151. | 1.02* | 1.29*  |
| ACE | RSL | RUSSELL MUNI                          | RUSSELL                | KS | 160025.  | 29049.  | 150. | 1.39  | 1.26   |
| ACE | LYO | LYONS-RICE COUNTY MUNI                | LYONS                  | KS | 101776.  | 58905.  | 98.  | 0.76* | 1.02*  |
| ACE | PHG | PHILLIPSBURG MUNI                     | PHILLIPSBURG           | KS | 107233.  | 45368.  | 81.  | 1.47  | 1.02   |
| ACE | K95 | ULYSSES                               | ULYSSES                | KS | 30285.   | 115227. | 1.   | 1.47  | 0.97   |
| ACE | PPF | TRI CITY                              | PARSONS                | KS | 109480.  | 24071.  | 108. | 0.71* | 0.89*  |
| ACE | 2K4 | LARNED-PANTEE COUNTY                  | LARNED                 | KS | 100045.  | 32651.  | 0.   | 1.03  | 0.88   |
| ACE | 3KC | STATE LINE AIRPARK                    | LEAWOOD                | KS | 181832.  | 37528.  | 0.   | 0.85  | 0.79   |
| ACE | K32 | RIVERSIDE                             | WICHITA                | KS | 4642.    | 70801.  | 0.   | 0.65  | 0.77   |
| ACE | 3JC | JUNCTION CITY MUNI                    | JUNCTION CITY          | KS | 80099.   | 35741.  | 270. | 1.30  | 0.77   |
| ACE | 2K3 | STANTON COUNTY MUNI                   | JOHNSON                | KS | 89687.   | 18617.  | 85.  | 0.55* | 0.72*  |
| ACE | K31 | COPELAND                              | WICHITA                | KS |          |         |      |       |        |

|     |      |                                   |    |          |         |       |       |        |
|-----|------|-----------------------------------|----|----------|---------|-------|-------|--------|
| ACE | RPB  | BELLEVILLE MUNI                   | KS | 57549.   | 36487.  | 53.   | 0.43* | 0.62*  |
| ACE | 1K4  | EL DORADO MUN                     | KS | 72046.   | 17198.  | 307.  | 1.49  | 0.59   |
| ACE | PTT  | PRATT MUNI                        | KS | 72734.   | 14308.  | 61.   | 0.77  | 0.58   |
| ACE | H77  | WELLINGTON MUNI                   | KS | 64682.   | 21255.  | 235.  | 1.76  | 0.57   |
| ACE | 8K4  | MEADE MUNI                        | KS | 64322.   | 16758.  | 58.   | 0.39* | 0.54*  |
| ACE | K88  | ALLEN COUNTY                      | KS | 32451.   | 46070.  | 0.    | 0.46  | 0.52   |
| ACE | K78  | ABILENE MUNI                      | KS | 40050.   | 34100.  | 0.    | 0.46  | 0.49   |
| ACE | 2K9  | SCOTT CITY MUNI                   | KS | 31393.   | 36573.  | 0.    | 0.40  | 0.45   |
| ACE | K50  | COOK AIRFIELD INC                 | KS | 47662.   | 15561.  | 0.    | 0.49  | 0.42   |
| ACE | 1K2  | CLAY CENTER MUNI                  | KS | 20772.   | 42242.  | 0.    | 0.34  | 0.42   |
| ACE | CBK  | SHALTZ FIELD                      | KS | 29615.   | 32158.  | 0.    | 1.24  | 0.41   |
| ACE | K74  | OAKLEY MUNI                       | KS | 30821.   | 31088.  | 0.    | 0.37  | 0.41   |
| ACE | K61  | BELOIT MUNI                       | KS | 30617.   | 29468.  | 105.  | 0.75  | 0.40   |
| ACE | 1K1  | BENTON                            | KS | 43324.   | 11670.  | 120.  | 0.79  | 0.37   |
| ACE | MPR  | MCPHERSON                         | KS | 39153.   | 12778.  | 0.    | 1.62  | 0.35   |
| ACE | K75  | OSBORNE MUNI                      | KS | 10514.   | 42794.  | 0.    | 0.24  | 0.35   |
| ACE | 7K1  | HERINGTON MUNI                    | KS | 23476.   | 27053.  | 80.   | 0.65  | 0.34   |
| ACE | ANY  | ANTHONY MUNI                      | KS | 37911.   | 12237.  | 130.  | 0.88  | 0.33   |
| ACE | HLC  | HILL CITY MUNI                    | KS | 32191.   | 15806.  | 0.    | 0.35  | 0.32   |
| ACE | 1K8  | HUGOTON MUNI                      | KS | 35978.   | 11743.  | 0.    | 0.37  | 0.32   |
| ACE | K504 | PLAINVILLE ARPK                   | KS | 12753.   | 29473.  | 0.    | 0.21  | 0.28   |
| ACE | K68  | GARNETT MUNI                      | KS | 19910.   | 17317.  | 0.    | 0.24  | 0.25   |
| ACE | 30T  | OTTAWA MUNI                       | KS | 27147.   | 9941.   | 0.    | 0.28  | 0.25   |
| ACE | 9K8  | KINGMAN MUNI                      | KS | 23381.   | 12930.  | 0.    | 0.28  | 0.25   |
| ACE | K60  | ATWOOD-RAWLINS COUNTY CITY-COUNTY | KS | 18392.   | 16505.  | 0.    | 0.22  | 0.23   |
| ACE | K34  | GARDNER MUNI                      | KS | 24543.   | 8011.   | 0.    | 0.21  | 0.22   |
| ACE | K81  | OSAWATOMIE-PAOLA MUNI             | KS | 19015.   | 11193.  | 0.    | 0.21  | 0.20   |
| ACE | K59  | AMELIA EARHART                    | KS | 22234.   | 7257.   | 0.    | 0.23  | 0.20   |
| ACE | 13K  | EUREKA MUNI                       | KS | 19078.   | 7580.   | 0.    | 0.20  | 0.18   |
| ACE | K80  | OSERLIN MUNI                      | KS | 14057.   | 13029.  | 0.    | 0.17  | 0.18   |
| ACE | K73  | NORTON MUNI                       | KS | 14226.   | 9943.   | 0.    | 0.16  | 0.16   |
| ACE | 5K2  | TRIBUNE MUNI                      | KS | 18070.   | 5898.   | 0.    | 0.19  | 0.16   |
| ACE | 1K5  | ELKHART-MORTON COUNTY             | KS | 14967.   | 6135.   | 0.    | 0.16  | 0.14   |
| ACE | 2K7  | ST FRANCIS MUNI                   | KS | 7236.    | 12863.  | 0.    | 0.11  | 0.13   |
| ACE | 2K5  | NEODESHA MUNI                     | KS | 16618.   | 3091.   | 15.   | 0.14  | 0.13   |
| ACE | 69K  | MARYSVILLE MUNI                   | KS | 13982.   | 4564.   | 0.    | 0.14  | 0.12   |
| ACE | 3TA  | WAMEGO MUNI                       | KS | 12272.   | 4005.   | 0.    | 0.12  | 0.11   |
| ACE | 8K8  | STAFFORD MUNI                     | KS | 7255.    | 7667.   | 0.    | 0.09  | 0.10   |
| ACE | 3K3  | CIMARRON MUNICIPAL                | KS | 11826.   | 3860.   | 0.    | 0.12  | 0.10   |
| ACE | 70K  | SYRACUSE-HAMILTON COUNTY MUNI     | KS | 8269.    | 2087.   | 0.    | 0.08  | 0.07   |
| ACE | 56K  | MAIZE                             | KS | 6393.    | 2087.   | 0.    | 0.06  | 0.06   |
| ACE | K64  | PLAINS MUNI                       | KS | 6594.    | 2152.   | 0.    | 0.07  | 0.06   |
| ACE | 1K3  | VINLAND VALLEY AERODROME          | KS | 7158.    | 2336.   | 0.    | 0.07  | 0.06   |
| ACE | K82  | HAMILTON FIELD                    | KS | 7256.    | 2368.   | 0.    | 0.07  | 0.06   |
| ACE | K71  | SMITH CENTER MUNI                 | KS | 6026.    | 1967.   | 0.    | 0.06  | 0.05   |
| ACE |      | LINCOLN MUNI                      | KS | 6184.    | 2019.   | 0.    | 0.06  | 0.05   |
| ACE | 3WE  | WEISS                             | MO | 1827253. | 76423.  | 1287. | 8.56* | 14.64* |
| ACE | K84  | MC COMAS-LEE'S SUMMIT MUNI        | MO | 1758036. | 302987. | 1151. | 7.76* | 13.69* |
| ACE | 3GV  | EAST KANSAS CITY                  | MO | 1052323. | 289708. | 1022. | 8.70  | 8.92   |
| ACE | 35Z  | ST. CHARLES COUNTY                | MO | 977499.  | 182687. | 745.  | 4.92* | 7.71*  |
| ACE | JEF  | JEFFERSON CITY MEML               | MO | 881824.  | 255538. | 832.  | 6.00* | 7.56*  |
| ACE | VIH  | ROLLA NATIONAL                    | MO | 682205.  | 217619. | 716.  | 4.38  | 5.98*  |
| ACE | K07  | ROLLA DOWNTOWN                    | MO | 676763.  | 219819. | 682.  | 5.27* | 5.96*  |
| ACE | HIG  | HIGGINSVILLE INDUSTRIAL MUNI      | MO | 494009.  | 118060. | 446.  | 6.41  | 4.07   |
| ACE | MAW  | MALDEN MUNI                       | MO | 428299.  | 170532. | 426.  | 3.10  | 3.98   |
| ACE | K48  | CHILLICOTHE MUNICIPAL             | MO | 345538.  | 144299. | 289.  | 2.77  | 3.25   |
| ACE | POF  | EARL FIELDS MEMORIAL              | MO | 308044.  | 160950. | 177.  | 1.92  | 3.12   |
| ACE | A1Z  | LEE C FINE MEMORIAL               | MO | 243239.  | 147271. | 179.  | 2.02  | 2.59   |
| ACE | M43  | DEXTER MUNI                       | MO | 315393.  | 66703.  | 301.  | 2.77  | 2.54   |

| ACE | 359  | 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 | L80  | FLOYD W. JONES LEBANON        | LEBANON                | MO | 247137 | 54988  | 239 | 1.96  | 2.01  |
| ACE | B62  | 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 | K22  | 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 | 130021 | 118782 | 0   | 1.71  | 1.06  |
| ACE | K02  | PERRYVILLE MUN                | PERRYVILLE             | MO | 130021 | 27508  | 129 | 0.87* | 1.05* |
| ACE | S1K  | SIKESTON MEML MUNI            | SIKESTON               | MO | 68599  | 83507  | 0   | 2.64  | 1.01  |
| ACE | 82K  | CAMERON MUNI                  | CAMERON                | MO | 85611  | 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 | M050 | 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 | E05  | NEOSHO MEML                   | NEOSHO                 | MO | 55150  | 30516  | 1   | 2.27  | 0.57  |
| ACE | 1H0  | MARSHALL MEMI MUNI            | MARSHALL               | MO | 35523  | 47193  | 0   | 0.49  | 0.55  |
| ACE | 9K4  | CPEVE COEUR                   | ST LOUIS               | MO | 55762  | 23236  | 0   | 0.59  | 0.52  |
| ACE | 2H2  | SKYHAVEN                      | WARRENSBURG            | MO | 57613  | 20434  | 194 | 1.28  | 0.52  |
| ACE | M049 | AURORA MEMORIAL MUNI          | AURORA                 | MO | 15637  | 61336  | 0   | 0.34  | 0.51  |
| ACE | 3EX  | WASHINGTON MEMORIAL           | WASHINGTON             | MO | 27957  | 42864  | 0   | 0.40  | 0.47  |
| ACE | 75K  | EXCELSIOR SPRINGS MEMORIAL    | EXCELSIOR SPRINGS      | MO | 28095  | 48099  | 0   | 0.38  | 0.47  |
| ACE | 94K  | BETHANY MEMORIAL              | BETHANY                | MO | 51844  | 16926  | 0   | 0.51  | 0.46  |
| ACE | H19  | CASSVILLE MUNICIPAL           | CASSVILLE              | MO | 54921  | 9452   | 52  | 0.35* | 0.43* |
| ACE | 3VS  | BOWLING GREEN MUNICIPAL       | BOWLING GREEN          | MO | 39525  | 25938  | 134 | 0.94  | 0.43  |
| ACE | HAE  | RJY OTTEN MEMORIAL AIRFIELD   | VERSAILLES             | MO | 16971  | 43609  | 0   | 0.30  | 0.40  |
| ACE | K56  | HANNIBAL MUNI                 | HANNIBAL               | MO | 28095  | 29613  | 0   | 1.18  | 0.38  |
| ACE | H21  | MARYVILLE MEML                | MARYVILLE              | MO | 24082  | 28266  | 0   | 0.32  | 0.35  |
| ACE | H20  | CAMDENTON MEMORIAL            | CAMDENTON              | MO | 24553  | 24329  | 0   | 0.30  | 0.32  |
| ACE | M05  | MYERS PARK MEMORIAL MUNICIPAL | CARTHAGE               | MO | 35436  | 11566  | 0   | 0.37  | 0.31  |
| ACE | H74  | CARUTHERSVILLE MEMORIAL       | CARUTHERSVILLE         | MO | 18717  | 28602  | 0   | 0.27  | 0.31  |
| ACE | 4K3  | CABOOL MEMORIAL               | CABOOL                 | MO | 31256  | 13168  | 99  | 0.66  | 0.30  |
| ACE | 35M  | LEXINGTON MUNI                | LEXINGTON              | MO | 16726  | 28300  | 0   | 0.25  | 0.30  |
| ACE | M010 | MISSISSIPPI COUNTY            | CHARLESTON             | MO | 24249  | 18415  | 0   | 0.29  | 0.28  |
| ACE | M14  | ROOSTERVILLE                  | LIBERTY                | MO | 28508  | 9306   | 0   | 0.29  | 0.25  |
| ACE | UBX  | KENNETT MEMORIAL              | KENNETT                | MO | 20737  | 16883  | 0   | 0.25  | 0.25  |
| ACE | M043 | CUBA MUNI                     | CUBA                   | MO | 23484  | 10393  | 0   | 0.24  | 0.23  |
| ACE | M008 | STOCKTON MUNI                 | STOCKTON               | MO | 23903  | 7801   | 0   | 0.23  | 0.21  |
| ACE | M016 | LAKE WINNEBAGO MUNI           | LAKE WINNEBAGO         | MO | 22882  | 7469   | 0   | 0.24  | 0.20  |
| ACE | M12  | MEMPHIS MEMORIAL              | MEMPHIS                | MO | 14180  | 15875  | 0   | 0.18  | 0.20  |
| ACE | H65  | STEELE MUNI                   | STEELE                 | MO | 22318  | 8408   | 0   | 0.22  | 0.20  |
| ACE | K39  | FULTON MUNI                   | FULTON                 | MO | 14883  | 14089  | 48  | 0.36  | 0.19  |
| ACE | K52  | ST CLAIR MEMORIAL             | ST CLAIR               | MO | 19884  | 9308   | 0   | 0.22  | 0.19* |
| ACE | 34M  | MONROE CITY REGIONAL          | MONROE CITY            | MO | 23779  | 6223   | 23  | 0.15* | 0.18  |
| ACE | M085 | CAMPBELL MUNI                 | CAMPBELL               | MO | 19866  | 6485   | 0   | 0.20  | 0.18  |
| ACE | 4M04 | HARRISONVILLE                 | HARRISONVILLE          | MO | 18896  | 8698   | 0   | 0.20  | 0.16  |
| ACE | 1H5  | MISSOURI CITY                 | LIBERTY                | MO | 13819  | 9629   | 0   | 0.16  | 0.15  |
| ACE |      | WILLOW SPRINGS MEMORIAL       | WILLOW SPRINGS         | MO | 17283  | 5641   | 0   | 0.17  |       |

|     |      |                          |                   |         |         |      |       |       |
|-----|------|--------------------------|-------------------|---------|---------|------|-------|-------|
| ACE | 73K  | BILL MARTIN MEMORIAL     | AVA               | 15743.  | 5138.   | 0.   | 0.15  | 0.14  |
| ACE | H64  | LAMAR MUNI               | LAMAR             | 13454.  | 4391.   | 0.   | 0.13  | 0.12  |
| ACE | H62  | SULLIVAN MEMORIAL        | SULLIVAN          | 12566.  | 4101.   | 0.   | 0.13  | 0.11  |
| ACE | K04  | HAERR FIELD              | TAYLOR            | 11336.  | 3700.   | 0.   | 0.12  | 0.10  |
| ACE | K57  | GOULD PETERSON MUNICIPAL | TARKIO            | 11839.  | 3864.   | 0.   | 0.12  | 0.10  |
| ACE | M014 | MANSFIELD MUNI           | MANSFIELD         | 8856.   | 5708.   | 0.   | 0.10  | 0.10  |
| ACE | M84  | BOONVILLE MUNI           | BOONVILLE         | 10735.  | 3504.   | 0.   | 0.11  | 0.09  |
| ACE | K89  | MACON-POWER MEML         | MACON             | 7778.   | 2539.   | 0.   | 0.08  | 0.07  |
| ACE | 78Y  | RANKIN                   | MARYVILLE         | 6169.   | 4194.   | 0.   | 0.07  | 0.07  |
| ACE | H79  | ELDON MODEL AIRPARK      | ELDON             | 8239.   | 2689.   | 0.   | 0.08  | 0.07  |
| ACE | M48  | HOUSTON MEMORIAL         | HOUSTON           | 7368.   | 2405.   | 0.   | 0.08  | 0.06  |
| ACE | K33  | SALEM MEMORIAL           | SALEM             | 6629.   | 2164.   | 0.   | 0.06  | 0.06  |
| ACE | K26  | CARROLLTON MEMORIAL      | CARROLLTON        | 5778.   | 1886.   | 0.   | 0.06  | 0.05  |
| ACE | K45  | ALBANY MEMORIAL          | ALBANY            | 3987.   | 1301.   | 0.   | 0.04  | 0.04  |
| ACE | M003 | MODERS                   | HOUSE SPRINGS     | 3158.   | 1031.   | 0.   | 0.03  | 0.03  |
| ACE | M013 | TWIN CITY AIRPARK        | LUTESVILLE        | 3600.   | 1175.   | 0.   | 0.04  | 0.03  |
| ACE | 89K  | FARRIS STRIP             | FAUCETT           | 1017.   | 332.    | 0.   | 0.01  | 0.01  |
| ACE | EAR  | KEARNEY MUNI             | KEARNEY           | 569950. | 202691. | 515. | 4.10  | 5.13  |
| ACE | OLU  | COLUMBUS MUNI            | COLUMBUS          | 411588. | 175893. | 382. | 3.15  | 3.90  |
| ACE | HSI  | HASTINGS MUNI            | HASTINGS          | 346635. | 164374. | 302. | 2.63  | 3.40  |
| ACE | MCK  | MCCOOK MUNI              | MCCOOK            | 290425. | 156788. | 262. | 2.76  | 2.97  |
| ACE | MLE  | MILLARD                  | OMAHA             | 274805. | 164484. | 0.   | 5.78  | 2.92  |
| ACE | SNY  | SIDNEY MUNI              | SIDNEY            | 201984. | 141458. | 174. | 2.00  | 2.28  |
| ACE | AIA  | ALLIANCE MUNI            | ALLIANCE          | 190141. | 139272. | 137. | 1.74  | 2.19  |
| ACE | FET  | FREMONT MUNI             | FREMONT           | 197005. | 131372. | 185. | 1.73  | 2.18  |
| ACE | CDR  | CHADRON MUNI             | CHADRON           | 194104. | 117525. | 134. | 2.00  | 2.07  |
| ACE | BIE  | BEATRICE MUNI            | BEATRICE          | 176602. | 96760.  | 160. | 1.36  | 1.82  |
| ACE | HDE  | COZAD MUNI               | COZAD             | 144342. | 45548.  | 139. | 0.96* | 1.26* |
| ACE | CZE  | BREWSTER FIELD           | HOLDREGE          | 97393.  | 45759.  | 92.  | 0.81  | 0.95  |
| ACE | LCG  | WAYNE MUNI               | WAYNE             | 80045.  | 59049.  | 74.  | 0.63* | 0.92* |
| ACE | OGA  | SEARLE FIELD             | OGALLALA          | 91388.  | 29604.  | 58.  | 1.53  | 0.80  |
| ACE | BBW  | BROKEN BOW MUNI          | BROKEN BOW        | 34402.  | 81248.  | 24.  | 0.53  | 0.77  |
| ACE | 3NO  | NORTH OMAHA              | OMAHA             | 71371.  | 43112.  | 0.   | 0.79  | 0.76  |
| ACE | LXM  | LEXINGTON MUNI           | LEXINGTON         | 34449.  | 75698.  | 0.   | 1.46  | 0.73  |
| ACE | ANW  | AINSWORTH MUNI           | AINSWORTH         | 15151.  | 83065.  | 0.   | 0.66  | 0.65  |
| ACE | 7K8  | MARTIN FIELD             | SO SIOUX CITY     | 52816.  | 41947.  | 0.   | 0.62  | 0.63  |
| ACE | PMV  | PLATTSMOUTH MUNI         | PLATTSMOUTH       | 73630.  | 19262.  | 232. | 1.49  | 0.62  |
| ACE | ONL  | O NEILL MUNI             | O NEILL           | 67470.  | 24344.  | 64.  | 0.53  | 0.61  |
| ACE | 09K  | SARGENT MUNI             | SARGENT           | 3670.   | 76475.  | 0.   | 0.30  | 0.53  |
| ACE | K46  | FLIGHTLAND               | OMAHA             | 48839.  | 21358.  | 0.   | 0.51  | 0.47  |
| ACE | AUH  | AURORA MUNI              | AURORA            | 37512.  | 26549.  | 98.  | 0.90  | 0.43  |
| ACE | GTE  | GOTHENBURG MUNI          | GOTHENBURG        | 34831.  | 19898.  | 112. | 0.75  | 0.36  |
| ACE | 08K  | HARVARD STATE            | HARVARD           | 34770.  | 17554.  | 0.   | 0.38  | 0.35  |
| ACE | K17  | YORK MUNI                | YORK              | 20699.  | 31144.  | 0.   | 0.29  | 0.34  |
| ACE | 4V7  | KIMBALL MUNI             | KIMBALL           | 11929.  | 30222.  | 0.   | 0.21  | 0.24  |
| ACE | 30A  | SOUTH OMAHA              | OMAHA /PAPILLION/ | 23375.  | 12582.  | 0.   | 0.25  | 0.22  |
| ACE | 9V5  | MODISSETT                | RUSHVILLE         | 5866.   | 26613.  | 0.   | 0.14  | 0.22  |
| ACE | 4V9  | ANTELOPE COUNTY FIELD    | NELIGH            | 19429.  | 11641.  | 0.   | 0.21  | 0.21  |
| ACE | QDX  | EVELYN SHARP FIELD       | ORD               | 14239.  | 15483.  | 0.   | 0.18  | 0.20  |
| ACE | 0V3  | PIONEER VILLAGE FIELD    | MINDEN            | 11425.  | 18650.  | 0.   | 0.17  | 0.20  |
| ACE | 12K  | SUPERIOR MUNI            | SUPERIOR          | 15752.  | 14530.  | 25.  | 0.26  | 0.20  |
| ACE | OKS  | OSHKOSH MUNI             | OSHKOSH           | 23270.  | 5742.   | 0.   | 0.14  | 0.19  |
| ACE | IML  | IMPERIAL MUNI            | IMPERIAL          | 14977.  | 14095.  | 37.  | 0.29  | 0.19  |
| ACE | NE22 | TEKAMAH                  | TEKAMAH           | 20251.  | 6612.   | 0.   | 0.21  | 0.18  |
| ACE | 07K  | CENTRAL CITY MUNI        | CENTRAL CITY      | 12053.  | 14435.  | 0.   | 0.15  | 0.18  |
| ACE | 84Y  | BLOOMFIELD MUNI          | BLOOMFIELD        | 17460.  | 8414.   | 0.   | 0.18  | 0.17  |
| ACE | 93Y  | DAVID CITY MUNI          | DAVID CITY        | 9705.   | 16243.  | 0.   | 0.14  | 0.17  |
| ACE | FNB  | BRENNER FIELD            | FALLS CITY        | 18421.  | 6013.   | 0.   | 0.19  | 0.16  |
| ACE | FBY  | FAIRBURY MUNI            | FAIRBURY          | 14731.  | 9443.   | 32.  | 0.25  | 0.16  |

| ACE | BUB  | CRAM FIELD              | NE | 10119. | 11814. | 9.  | 0.09* | 0.15* |
|-----|------|-------------------------|----|--------|--------|-----|-------|-------|
| ACE | SCB  | SCRIBNER STATE          | NE | 13659. | 9411.  | 0.  | 0.16  | 0.15  |
| ACE | 7NE7 | SEWARD MUNI             | NE | 11135. | 11562. | 0.  | 0.14  | 0.15  |
| ACE | AHQ  | WAHOO MUNI              | NE | 15895. | 6082.  | 10. | 0.12* | 0.15* |
| ACE | K13  | FAIRMONT STATE AIRFIELD | NE | 12204. | 10231. | 0.  | 0.15  | 0.15  |
| ACE | 15K  | ALBION MUNI             | NE | 12863. | 9470.  | 0.  | 0.14  | 0.15  |
| ACE | CSB  | CAMBRIDGE MUNI          | NE | 11875. | 8963.  | 0.  | 0.14  | 0.14  |
| ACE | 3GN  | GRUNDMAN                | NE | 14812. | 4836.  | 0.  | 0.15  | 0.13  |
| ACE | NE02 | HARTINGTON MUNI         | NE | 6033.  | 13016. | 0.  | 0.10  | 0.13  |
| ACE | 6K3  | CREIGHTON MUNI          | NE | 5363.  | 14120. | 0.  | 0.10  | 0.13  |
| ACE | 5V3  | THOMAS COUNTY           | NE | 8304.  | 9749.  | 5.  | 0.08* | 0.12* |
| ACE | K03  | CRETE MUNI              | NE | 8363.  | 10146. | 0.  | 0.31  | 0.12  |
| ACE | 47V  | CURTIS MUNI             | NE | 8279.  | 7654.  | 0.  | 0.10  | 0.11  |
| ACE | GRN  | GORDON MUNI             | NE | 7820.  | 7504.  | 0.  | 0.10  | 0.10  |
| ACE | 0V0  | GRANT MUNI              | NE | 9960.  | 3252.  | 0.  | 0.10  | 0.09  |
| ACE | K09  | HEBRON MUNI             | NE | 7403.  | 4875.  | 0.  | 0.08  | 0.08  |
| ACE | 7V7  | RED CLOUD MUNI          | NE | 7402.  | 2416.  | 0.  | 0.07  | 0.07  |
| ACE | K01  | AUBURN MUNI             | NE | 013.   | 4175.  | 0.  | 0.06  | 0.06  |
| ACE | NE21 | TECUMSEH MUNICIPAL      | NE | 6973.  | 2276.  | 0.  | 0.07  | 0.06  |
| ACE | NE23 | FLYING V                | NE | 5701.  | 1861.  | 0.  | 0.06  | 0.05  |
| ACE | 8V2  | STUART-ATKINSON MUNI    | NE | 4633.  | 2072.  | 0.  | 0.05  | 0.04  |

#### EASTERN REGION

| AEA                                                                                                                                          | 33N                                                                                                                             | DELAWARE AIRPARK                                                                                                   | DE                                                                                | 639262.  | 211667. | 652.  | 3.29  | 5.65  |
|----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------|---------|-------|-------|-------|
| AEA <td>GED <td>SUSSEX COUNTY <td>DE <td>331583.</td> <td>163185.</td> <td>321.</td> <td>2.35</td> <td>3.29</td> </td></td></td>             | GED <td>SUSSEX COUNTY <td>DE <td>331583.</td> <td>163185.</td> <td>321.</td> <td>2.35</td> <td>3.29</td> </td></td>             | SUSSEX COUNTY <td>DE <td>331583.</td> <td>163185.</td> <td>321.</td> <td>2.35</td> <td>3.29</td> </td>             | DE <td>331583.</td> <td>163185.</td> <td>321.</td> <td>2.35</td> <td>3.29</td>    | 331583.  | 163185. | 321.  | 2.35  | 3.29  |
| AEA <td>REH <td>REHOBOTH AIRCRAFTERS <td>DE <td>257095.</td> <td>139130.</td> <td>241.</td> <td>1.91*</td> <td>2.63*</td> </td></td></td>    | REH <td>REHOBOTH AIRCRAFTERS <td>DE <td>257095.</td> <td>139130.</td> <td>241.</td> <td>1.91*</td> <td>2.63*</td> </td></td>    | REHOBOTH AIRCRAFTERS <td>DE <td>257095.</td> <td>139130.</td> <td>241.</td> <td>1.91*</td> <td>2.63*</td> </td>    | DE <td>257095.</td> <td>139130.</td> <td>241.</td> <td>1.91*</td> <td>2.63*</td>  | 257095.  | 139130. | 241.  | 1.91* | 2.63* |
| AEA <td>N92 <td>SUMMIT AIRPARK <td>DE <td>96944.</td> <td>65996.</td> <td>0.</td> <td>2.96</td> <td>1.08</td> </td></td></td>                | N92 <td>SUMMIT AIRPARK <td>DE <td>96944.</td> <td>65996.</td> <td>0.</td> <td>2.96</td> <td>1.08</td> </td></td>                | SUMMIT AIRPARK <td>DE <td>96944.</td> <td>65996.</td> <td>0.</td> <td>2.96</td> <td>1.08</td> </td>                | DE <td>96944.</td> <td>65996.</td> <td>0.</td> <td>2.96</td> <td>1.08</td>        | 96944.   | 65996.  | 0.    | 2.96  | 1.08  |
| AEA <td>0N4 <td>CHANDELLE ESTATES <td>DE <td>75202.</td> <td>73660.</td> <td>0.</td> <td>0.94</td> <td>0.99</td> </td></td></td>             | 0N4 <td>CHANDELLE ESTATES <td>DE <td>75202.</td> <td>73660.</td> <td>0.</td> <td>0.94</td> <td>0.99</td> </td></td>             | CHANDELLE ESTATES <td>DE <td>75202.</td> <td>73660.</td> <td>0.</td> <td>0.94</td> <td>0.99</td> </td>             | DE <td>75202.</td> <td>73660.</td> <td>0.</td> <td>0.94</td> <td>0.99</td>        | 75202.   | 73660.  | 0.    | 0.94  | 0.99  |
| AEA <td>N98 <td>MILFORD AIRPARK <td>DE <td>11217.</td> <td>20145.</td> <td>0.</td> <td>0.17</td> <td>0.21</td> </td></td></td>               | N98 <td>MILFORD AIRPARK <td>DE <td>11217.</td> <td>20145.</td> <td>0.</td> <td>0.17</td> <td>0.21</td> </td></td>               | MILFORD AIRPARK <td>DE <td>11217.</td> <td>20145.</td> <td>0.</td> <td>0.17</td> <td>0.21</td> </td>               | DE <td>11217.</td> <td>20145.</td> <td>0.</td> <td>0.17</td> <td>0.21</td>        | 11217.   | 20145.  | 0.    | 0.17  | 0.21  |
| AEA <td>15N <td>JENKINS <td>DE <td>12992.</td> <td>9734.</td> <td>0.</td> <td>0.15</td> <td>0.15</td> </td></td></td>                        | 15N <td>JENKINS <td>DE <td>12992.</td> <td>9734.</td> <td>0.</td> <td>0.15</td> <td>0.15</td> </td></td>                        | JENKINS <td>DE <td>12992.</td> <td>9734.</td> <td>0.</td> <td>0.15</td> <td>0.15</td> </td>                        | DE <td>12992.</td> <td>9734.</td> <td>0.</td> <td>0.15</td> <td>0.15</td>         | 12992.   | 9734.   | 0.    | 0.15  | 0.15  |
| AEA <td>38N <td>SMYRNA <td>DE <td>11626.</td> <td>6551.</td> <td>0.</td> <td>0.12</td> <td>0.12</td> </td></td></td>                         | 38N <td>SMYRNA <td>DE <td>11626.</td> <td>6551.</td> <td>0.</td> <td>0.12</td> <td>0.12</td> </td></td>                         | SMYRNA <td>DE <td>11626.</td> <td>6551.</td> <td>0.</td> <td>0.12</td> <td>0.12</td> </td>                         | DE <td>11626.</td> <td>6551.</td> <td>0.</td> <td>0.12</td> <td>0.12</td>         | 11626.   | 6551.   | 0.    | 0.12  | 0.12  |
| AEA <td>N06 <td>LAUREL <td>DE <td>8739.</td> <td>2853.</td> <td>0.</td> <td>0.09</td> <td>0.08</td> </td></td></td>                          | N06 <td>LAUREL <td>DE <td>8739.</td> <td>2853.</td> <td>0.</td> <td>0.09</td> <td>0.08</td> </td></td>                          | LAUREL <td>DE <td>8739.</td> <td>2853.</td> <td>0.</td> <td>0.09</td> <td>0.08</td> </td>                          | DE <td>8739.</td> <td>2853.</td> <td>0.</td> <td>0.09</td> <td>0.08</td>          | 8739.    | 2853.   | 0.    | 0.09  | 0.08  |
| AEA <td>SBY <td>SALISBURY-WICOMICO COUNTY <td>MD <td>1424433.</td> <td>338446.</td> <td>0.</td> <td>2.29</td> <td>11.71</td> </td></td></td> | SBY <td>SALISBURY-WICOMICO COUNTY <td>MD <td>1424433.</td> <td>338446.</td> <td>0.</td> <td>2.29</td> <td>11.71</td> </td></td> | SALISBURY-WICOMICO COUNTY <td>MD <td>1424433.</td> <td>338446.</td> <td>0.</td> <td>2.29</td> <td>11.71</td> </td> | MD <td>1424433.</td> <td>338446.</td> <td>0.</td> <td>2.29</td> <td>11.71</td>    | 1424433. | 338446. | 0.    | 2.29  | 11.71 |
| AEA <td>GAI <td>MONTGOMERY COUNTY ARPK <td>MD <td>1300322.</td> <td>331389.</td> <td>1263.</td> <td>8.71</td> <td>10.84</td> </td></td></td> | GAI <td>MONTGOMERY COUNTY ARPK <td>MD <td>1300322.</td> <td>331389.</td> <td>1263.</td> <td>8.71</td> <td>10.84</td> </td></td> | MONTGOMERY COUNTY ARPK <td>MD <td>1300322.</td> <td>331389.</td> <td>1263.</td> <td>8.71</td> <td>10.84</td> </td> | MD <td>1300322.</td> <td>331389.</td> <td>1263.</td> <td>8.71</td> <td>10.84</td> | 1300322. | 331389. | 1263. | 8.71  | 10.84 |
| AEA <td>MTN <td>GLENN L. MARTIN STATE <td>MD <td>809587.</td> <td>159066.</td> <td>740.</td> <td>4.27*</td> <td>6.44*</td> </td></td></td>   | MTN <td>GLENN L. MARTIN STATE <td>MD <td>809587.</td> <td>159066.</td> <td>740.</td> <td>4.27*</td> <td>6.44*</td> </td></td>   | GLENN L. MARTIN STATE <td>MD <td>809587.</td> <td>159066.</td> <td>740.</td> <td>4.27*</td> <td>6.44*</td> </td>   | MD <td>809587.</td> <td>159066.</td> <td>740.</td> <td>4.27*</td> <td>6.44*</td>  | 809587.  | 159066. | 740.  | 4.27* | 6.44* |
| AEA <td>W18 <td>SUBURBAN <td>MD <td>700564.</td> <td>130159.</td> <td>644.</td> <td>4.16*</td> <td>5.52*</td> </td></td></td>                | W18 <td>SUBURBAN <td>MD <td>700564.</td> <td>130159.</td> <td>644.</td> <td>4.16*</td> <td>5.52*</td> </td></td>                | SUBURBAN <td>MD <td>700564.</td> <td>130159.</td> <td>644.</td> <td>4.16*</td> <td>5.52*</td> </td>                | MD <td>700564.</td> <td>130159.</td> <td>644.</td> <td>4.16*</td> <td>5.52*</td>  | 700564.  | 130159. | 644.  | 4.16* | 5.52* |
| AEA <td>FDK <td>FREDERICK MUNI <td>MD <td>596747.</td> <td>135097.</td> <td>498.</td> <td>5.81</td> <td>4.86</td> </td></td></td>            | FDK <td>FREDERICK MUNI <td>MD <td>596747.</td> <td>135097.</td> <td>498.</td> <td>5.81</td> <td>4.86</td> </td></td>            | FREDERICK MUNI <td>MD <td>596747.</td> <td>135097.</td> <td>498.</td> <td>5.81</td> <td>4.86</td> </td>            | MD <td>596747.</td> <td>135097.</td> <td>498.</td> <td>5.81</td> <td>4.86</td>    | 596747.  | 135097. | 498.  | 5.81  | 4.86  |
| AEA <td>N80 <td>OCEAN CITY <td>MD <td>506517.</td> <td>193248.</td> <td>0.</td> <td>1.40</td> <td>4.65</td> </td></td></td>                  | N80 <td>OCEAN CITY <td>MD <td>506517.</td> <td>193248.</td> <td>0.</td> <td>1.40</td> <td>4.65</td> </td></td>                  | OCEAN CITY <td>MD <td>506517.</td> <td>193248.</td> <td>0.</td> <td>1.40</td> <td>4.65</td> </td>                  | MD <td>506517.</td> <td>193248.</td> <td>0.</td> <td>1.40</td> <td>4.65</td>      | 506517.  | 193248. | 0.    | 1.40  | 4.65  |
| AEA <td>ANP <td>LEE <td>MD <td>570122.</td> <td>115292.</td> <td>537.</td> <td>3.52*</td> <td>4.55*</td> </td></td></td>                     | ANP <td>LEE <td>MD <td>570122.</td> <td>115292.</td> <td>537.</td> <td>3.52*</td> <td>4.55*</td> </td></td>                     | LEE <td>MD <td>570122.</td> <td>115292.</td> <td>537.</td> <td>3.52*</td> <td>4.55*</td> </td>                     | MD <td>570122.</td> <td>115292.</td> <td>537.</td> <td>3.52*</td> <td>4.55*</td>  | 570122.  | 115292. | 537.  | 3.52* | 4.55* |
| AEA <td>CBE <td>CUMBERLAND MUNI <td>MD <td>396671.</td> <td>154278.</td> <td>367.</td> <td>2.86*</td> <td>3.66*</td> </td></td></td>         | CBE <td>CUMBERLAND MUNI <td>MD <td>396671.</td> <td>154278.</td> <td>367.</td> <td>2.86*</td> <td>3.66*</td> </td></td>         | CUMBERLAND MUNI <td>MD <td>396671.</td> <td>154278.</td> <td>367.</td> <td>2.86*</td> <td>3.66*</td> </td>         | MD <td>396671.</td> <td>154278.</td> <td>367.</td> <td>2.86*</td> <td>3.66*</td>  | 396671.  | 154278. | 367.  | 2.86* | 3.66* |
| AEA <td>2G4 <td>GARRETT COUNTY <td>MD <td>241386.</td> <td>111434.</td> <td>250.</td> <td>1.03</td> <td>2.34</td> </td></td></td>            | 2G4 <td>GARRETT COUNTY <td>MD <td>241386.</td> <td>111434.</td> <td>250.</td> <td>1.03</td> <td>2.34</td> </td></td>            | GARRETT COUNTY <td>MD <td>241386.</td> <td>111434.</td> <td>250.</td> <td>1.03</td> <td>2.34</td> </td>            | MD <td>241386.</td> <td>111434.</td> <td>250.</td> <td>1.03</td> <td>2.34</td>    | 241386.  | 111434. | 250.  | 1.03  | 2.34  |
| AEA <td>2W6 <td>ST MARYS COUNTY <td>MD <td>261956.</td> <td>72876.</td> <td>0.</td> <td>0.61</td> <td>2.22</td> </td></td></td>              | 2W6 <td>ST MARYS COUNTY <td>MD <td>261956.</td> <td>72876.</td> <td>0.</td> <td>0.61</td> <td>2.22</td> </td></td>              | ST MARYS COUNTY <td>MD <td>261956.</td> <td>72876.</td> <td>0.</td> <td>0.61</td> <td>2.22</td> </td>              | MD <td>261956.</td> <td>72876.</td> <td>0.</td> <td>0.61</td> <td>2.22</td>       | 261956.  | 72876.  | 0.    | 0.61  | 2.22  |
| AEA <td>W48 <td>ESSEX SKYPARK <td>MD <td>262627.</td> <td>53852.</td> <td>197.</td> <td>1.64*</td> <td>2.10*</td> </td></td></td>            | W48 <td>ESSEX SKYPARK <td>MD <td>262627.</td> <td>53852.</td> <td>197.</td> <td>1.64*</td> <td>2.10*</td> </td></td>            | ESSEX SKYPARK <td>MD <td>262627.</td> <td>53852.</td> <td>197.</td> <td>1.64*</td> <td>2.10*</td> </td>            | MD <td>262627.</td> <td>53852.</td> <td>197.</td> <td>1.64*</td> <td>2.10*</td>   | 262627.  | 53852.  | 197.  | 1.64* | 2.10* |
| AEA <td>W42 <td>FALLSTON <td>MD <td>232942.</td> <td>63323.</td> <td>209.</td> <td>0.59*</td> <td>1.97*</td> </td></td></td>                 | W42 <td>FALLSTON <td>MD <td>232942.</td> <td>63323.</td> <td>209.</td> <td>0.59*</td> <td>1.97*</td> </td></td>                 | FALLSTON <td>MD <td>232942.</td> <td>63323.</td> <td>209.</td> <td>0.59*</td> <td>1.97*</td> </td>                 | MD <td>232942.</td> <td>63323.</td> <td>209.</td> <td>0.59*</td> <td>1.97*</td>   | 232942.  | 63323.  | 209.  | 0.59* | 1.97* |
| AEA <td>ESN <td>EASTON MUNI <td>MD <td>117464.</td> <td>143337.</td> <td>1.</td> <td>4.10</td> <td>1.73</td> </td></td></td>                 | ESN <td>EASTON MUNI <td>MD <td>117464.</td> <td>143337.</td> <td>1.</td> <td>4.10</td> <td>1.73</td> </td></td>                 | EASTON MUNI <td>MD <td>117464.</td> <td>143337.</td> <td>1.</td> <td>4.10</td> <td>1.73</td> </td>                 | MD <td>117464.</td> <td>143337.</td> <td>1.</td> <td>4.10</td> <td>1.73</td>      | 117464.  | 143337. | 1.    | 4.10  | 1.73  |
| AEA <td>W00 <td>FREEMAN <td>MD <td>116174.</td> <td>48401.</td> <td>0.</td> <td>1.19</td> <td>1.09</td> </td></td></td>                      | W00 <td>FREEMAN <td>MD <td>116174.</td> <td>48401.</td> <td>0.</td> <td>1.19</td> <td>1.09</td> </td></td>                      | FREEMAN <td>MD <td>116174.</td> <td>48401.</td> <td>0.</td> <td>1.19</td> <td>1.09</td> </td>                      | MD <td>116174.</td> <td>48401.</td> <td>0.</td> <td>1.19</td> <td>1.09</td>       | 116174.  | 48401.  | 0.    | 1.19  | 1.09  |
| AEA <td>W29 <td>BAY BRIDGE INDUSTRIAL <td>MD <td>127148.</td> <td>35110.</td> <td>311.</td> <td>2.14</td> <td>1.08</td> </td></td></td>      | W29 <td>BAY BRIDGE INDUSTRIAL <td>MD <td>127148.</td> <td>35110.</td> <td>311.</td> <td>2.14</td> <td>1.08</td> </td></td>      | BAY BRIDGE INDUSTRIAL <td>MD <td>127148.</td> <td>35110.</td> <td>311.</td> <td>2.14</td> <td>1.08</td> </td>      | MD <td>127148.</td> <td>35110.</td> <td>311.</td> <td>2.14</td> <td>1.08</td>     | 127148.  | 35110.  | 311.  | 2.14  | 1.08  |
| AEA <td>W32 <td>HYDE FLD <td>MD <td>112917.</td> <td>42134.</td> <td>0.</td> <td>1.19</td> <td>1.03</td> </td></td></td>                     | W32 <td>HYDE FLD <td>MD <td>112917.</td> <td>42134.</td> <td>0.</td> <td>1.19</td> <td>1.03</td> </td></td>                     | HYDE FLD <td>MD <td>112917.</td> <td>42134.</td> <td>0.</td> <td>1.19</td> <td>1.03</td> </td>                     | MD <td>112917.</td> <td>42134.</td> <td>0.</td> <td>1.19</td> <td>1.03</td>       | 112917.  | 42134.  | 0.    | 1.19  | 1.03  |
| AEA <td>W54 <td>WESTMINSTER <td>MD <td>102690.</td> <td>25187.</td> <td>81.</td> <td>0.86</td> <td>0.85</td> </td></td></td>                 | W54 <td>WESTMINSTER <td>MD <td>102690.</td> <td>25187.</td> <td>81.</td> <td>0.86</td> <td>0.85</td> </td></td>                 | WESTMINSTER <td>MD <td>102690.</td> <td>25187.</td> <td>81.</td> <td>0.86</td> <td>0.85</td> </td>                 | MD <td>102690.</td> <td>25187.</td> <td>81.</td> <td>0.86</td> <td>0.85</td>      | 102690.  | 25187.  | 81.   | 0.86  | 0.85  |
| AEA <td>CGE <td>CAMBRIDGE MUNI <td>MD <td>38025.</td> <td>69090.</td> <td>0.</td> <td>0.51</td> <td>0.71</td> </td></td></td>                | CGE <td>CAMBRIDGE MUNI <td>MD <td>38025.</td> <td>69090.</td> <td>0.</td> <td>0.51</td> <td>0.71</td> </td></td>                | CAMBRIDGE MUNI <td>MD <td>38025.</td> <td>69090.</td> <td>0.</td> <td>0.51</td> <td>0.71</td> </td>                | MD <td>38025.</td> <td>69090.</td> <td>0.</td> <td>0.51</td> <td>0.71</td>        | 38025.   | 69090.  | 0.    | 0.51  | 0.71  |
| AEA <td>W28 <td>P G AIRPARK <td>MD <td>73629.</td> <td>31952.</td> <td>0.</td> <td>0.76</td> <td>0.70</td> </td></td></td>                   | W28 <td>P G AIRPARK <td>MD <td>73629.</td> <td>31952.</td> <td>0.</td> <td>0.76</td> <td>0.70</td> </td></td>                   | P G AIRPARK <td>MD <td>73629.</td> <td>31952.</td> <td>0.</td> <td>0.76</td> <td>0.70</td> </td>                   | MD <td>73629.</td> <td>31952.</td> <td>0.</td> <td>0.76</td> <td>0.70</td>        | 73629.   | 31952.  | 0.    | 0.76  | 0.70  |
| AEA <td>1W2 <td>BALTIMORE AIRPARK <td>MD <td>69476.</td> <td>25345.</td> <td>0.</td> <td>0.70</td> <td>0.63</td> </td></td></td>             | 1W2 <td>BALTIMORE AIRPARK <td>MD <td>69476.</td> <td>25345.</td> <td>0.</td> <td>0.70</td> <td>0.63</td> </td></td>             | BALTIMORE AIRPARK <td>MD <td>69476.</td> <td>25345.</td> <td>0.</td> <td>0.70</td> <td>0.63</td> </td>             | MD <td>69476.</td> <td>25345.</td> <td>0.</td> <td>0.70</td> <td>0.63</td>        | 69476.   | 25345.  | 0.    | 0.70  | 0.63  |
| AEA <td>0W3 <td>ALDINO <td>MD <td>30536.</td> <td>62571.</td> <td>0.</td> <td>0.48</td> <td>0.62</td> </td></td></td>                        | 0W3 <td>ALDINO <td>MD <td>30536.</td> <td>62571.</td> <td>0.</td> <td>0.48</td> <td>0.62</td> </td></td>                        | ALDINO <td>MD <td>30536.</td> <td>62571.</td> <td>0.</td> <td>0.48</td> <td>0.62</td> </td>                        | MD <td>30536.</td> <td>62571.</td> <td>0.</td> <td>0.48</td> <td>0.62</td>        | 30536.   | 62571.  | 0.    | 0.48  | 0.62  |
| AEA <td>W50 <td>DAVIS <td>MD <td>63302.</td> <td>20663.</td> <td>0.</td> <td>0.63</td> <td>0.56</td> </td></td></td>                         | W50 <td>DAVIS <td>MD <td>63302.</td> <td>20663.</td> <td>0.</td> <td>0.63</td> <td>0.56</td> </td></td>                         | DAVIS <td>MD <td>63302.</td> <td>20663.</td> <td>0.</td> <td>0.63</td> <td>0.56</td> </td>                         | MD <td>63302.</td> <td>20663.</td> <td>0.</td> <td>0.63</td> <td>0.56</td>        | 63302.   | 20663.  | 0.    | 0.63  | 0.56  |
| AEA <td>2W5 <td>MARYLAND <td>MD <td>46496.</td> <td>30921.</td> <td>0.</td> <td>0.52</td> <td>0.51</td> </td></td></td>                      | 2W5 <td>MARYLAND <td>MD <td>46496.</td> <td>30921.</td> <td>0.</td> <td>0.52</td> <td>0.51</td> </td></td>                      | MARYLAND <td>MD <td>46496.</td> <td>30921.</td> <td>0.</td> <td>0.52</td> <td>0.51</td> </td>                      | MD <td>46496.</td> <td>30921.</td> <td>0.</td> <td>0.52</td> <td>0.51</td>        | 46496.   | 30921.  | 0.    | 0.52  | 0.51  |
| AEA <td>2W2 <td>CLEARVIEW AIRPARK <td>MD <td>56250.</td> <td>11261.</td> <td>44.</td> <td>0.34*</td> <td>0.45*</td> </td></td></td>          | 2W2 <td>CLEARVIEW AIRPARK <td>MD <td>56250.</td> <td>11261.</td> <td>44.</td> <td>0.34*</td> <td>0.45*</td> </td></td>          | CLEARVIEW AIRPARK <td>MD <td>56250.</td> <td>11261.</td> <td>44.</td> <td>0.34*</td> <td>0.45*</td> </td>          | MD <td>56250.</td> <td>11261.</td> <td>44.</td> <td>0.34*</td> <td>0.45*</td>     | 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 | 18972.   | 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 | WUD | CAPE MAY COUNTY                 | WILDWOOD              | NJ | 1137595. | 291583. | 1314. | 5.83   | 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/GRADER FIELD | ATLANTIC CITY         | NJ | 468629.  | 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 | LAKWOOD                         | LAKWOOD               | 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.  | 1.83*  | 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                       | PITTSVILLE            | NJ | 112700.  | 23448.  | 126.  | 0.50   | 0.90   |
| AEA | N73 | RED LION                        | VINCENOTON            | NJ | 93451.   | 26764.  | 62.   | 0.70*  | 0.80*  |
| AEA | N85 | ALEXANDRIA                      | PITTSVILLE            | 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   |

| SCHE                                | CH                                  | NY | 15002  | 877    | 5.58* | 7.10* |
|-------------------------------------|-------------------------------------|----|--------|--------|-------|-------|
| SCHENECTADY COUNTY                  | CHAUTAUQUA COUNTY                   | NY | 914023 | 155002 | 5.58* | 7.10* |
| CHAUTAUQUA COUNTY                   | BUFFALO AIRPARK                     | NY | 587206 | 201677 | 3.14  | 5.24  |
| BUFFALO AIRPARK                     | WATERTOWN NEW YORK INTL             | NY | 612135 | 124948 | 3.24  | 4.90  |
| WATERTOWN NEW YORK INTL             | WUTSBORO-SULLIVAN COUNTY            | NY | 415483 | 173092 | 2.02  | 3.91  |
| WUTSBORO-SULLIVAN COUNTY            | STORMVILLE                          | NY | 474276 | 100958 | 3.08* | 3.82* |
| STORMVILLE                          | SULLIVAN COUNTY INTL                | NY | 460941 | 90837  | 2.98* | 3.67* |
| SULLIVAN COUNTY INTL                | WARREN COUNTY                       | NY | 397303 | 143239 | 2.75  | 3.59  |
| WARREN COUNTY                       | BROOKHAVEN                          | NY | 372851 | 158732 | 2.98  | 3.53  |
| BROOKHAVEN                          | RAMAPO VALLEY                       | NY | 290289 | 200118 | 0     | 3.26  |
| RAMAPO VALLEY                       | RICHARDS FIELD                      | NY | 268422 | 192776 | 0     | 3.06  |
| RICHARDS FIELD                      | LT. WARREN EATON                    | NY | 286411 | 149942 | 328   | 2.90  |
| LT. WARREN EATON                    | DANSVILLE MUNI                      | NY | 177279 | 135444 | 187   | 1.66* |
| DANSVILLE MUNI                      | CLINTON CO                          | NY | 142702 | 150216 | 0     | 1.95  |
| CLINTON CO                          | PRIOR AVIATION SERVICE INC          | NY | 156163 | 131719 | 169   | 1.91  |
| PRIOR AVIATION SERVICE INC          | CORTLAND COUNTY-CHASE FIELD         | NY | 135869 | 149703 | 0     | 1.91  |
| CORTLAND COUNTY-CHASE FIELD         | AKRON                               | NY | 154622 | 120564 | 129   | 1.83  |
| AKRON                               | SKY ACRES                           | NY | 205029 | 38557  | 222   | 0.99  |
| SKY ACRES                           | FLUSHING                            | NY | 113290 | 122882 | 109   | 1.16* |
| FLUSHING                            | ADIRONDACK                          | NY | 177457 | 57907  | 0     | 1.87  |
| ADIRONDACK                          | EAST HAMPTON                        | NY | 108833 | 123641 | 117   | 1.54  |
| EAST HAMPTON                        | PENN YAN                            | NY | 94883  | 136327 | 0     | 1.52  |
| PENN YAN                            | ELIZABETH FIELD                     | NY | 100193 | 124520 | 91    | 1.41  |
| ELIZABETH FIELD                     | OSWEGO COUNTY                       | NY | 104916 | 107766 | 106   | 1.03* |
| OSWEGO COUNTY                       | RANDALL                             | NY | 135253 | 66544  | 0     | 5.19  |
| RANDALL                             | WELLSVILLE MUNI ARPT, TARANTINE FLD | NY | 170044 | 31125  | 165   | 1.09* |
| WELLSVILLE MUNI ARPT, TARANTINE FLD | KOBELT                              | NY | 71045  | 118467 | 68    | 1.00  |
| KOBELT                              | SARATOGA COUNTY                     | NY | 132004 | 56546  | 0     | 1.47  |
| SARATOGA COUNTY                     | TRANSIT AIR PARK INC.               | NY | 86964  | 95598  | 0     | 3.52  |
| TRANSIT AIR PARK INC.               | KINGSTON-ULSTER                     | NY | 33806  | 116399 | 0     | 0.86  |
| KINGSTON-ULSTER                     | COLUMBIA COUNTY                     | NY | 32651  | 116021 | 0     | 0.85  |
| COLUMBIA COUNTY                     | PINE HILL                           | NY | 31272  | 115549 | 1     | 1.83  |
| PINE HILL                           | SIDNEY MUNI                         | NY | 122240 | 24496  | 117   | 0.77* |
| SIDNEY MUNI                         | SANDS POINT                         | NY | 23796  | 109782 | 1     | 1.12  |
| SANDS POINT                         | OGDENSBURG INTL                     | NY | 13972  | 109925 | 0     | 0.65  |
| OGDENSBURG INTL                     | SKY PARK                            | NY | 12503  | 109444 | 0     | 0.97  |
| SKY PARK                            | ONEONTA MUNI                        | NY | 84532  | 37348  | 86    | 0.64* |
| ONEONTA MUNI                        | ANGOLA AIRWAYS                      | NY | 19625  | 87198  | 0     | 0.53  |
| ANGOLA AIRWAYS                      | OLEAN MUNI                          | NY | 68251  | 22277  | 0     | 0.67  |
| OLEAN MUNI                          | SENECA FALLS AIRPORT INC            | NY | 51267  | 29490  | 0     | 1.78  |
| SENECA FALLS AIRPORT INC            | ORCHARD PARK                        | NY | 57587  | 18797  | 0     | 0.62  |
| ORCHARD PARK                        | LAKE PLACID                         | NY | 54191  | 17692  | 0     | 0.58  |
| LAKE PLACID                         | RENSSELAER COUNTY AIRPARK INC       | NY | 32267  | 37455  | 0     | 0.45  |
| RENSSELAER COUNTY AIRPARK INC       | LANCASTER AIRPORT INC               | NY | 9749   | 56912  | 0     | 0.32  |
| LANCASTER AIRPORT INC               | LANCASTOTA                          | NY | 46529  | 15192  | 0     | 0.49  |
| LANCASTOTA                          | PALMYRA AIRPARK                     | NY | 30498  | 22229  | 0     | 0.38  |
| PALMYRA AIRPARK                     | MATTITUCK AIRBASE                   | NY | 31841  | 20896  | 0     | 0.38  |
| MATTITUCK AIRBASE                   | HAMBURG AIRDRONE INC.               | NY | 27919  | 22564  | 0     | 0.35  |
| HAMBURG AIRDRONE INC.               | CAMILLUS                            | NY | 34774  | 11351  | 0     | 0.36  |
| CAMILLUS                            | MALONE-DUFORT                       | NY | 34391  | 11227  | 0     | 0.37  |
| MALONE-DUFORT                       | CORNING-PAINTED POST                | NY | 16560  | 27966  | 0     | 0.27  |
| CORNING-PAINTED POST                | LE ROY (FREUDIGMAN FIELD)           | NY | 25427  | 18306  | 0     | 0.30  |
| LE ROY (FREUDIGMAN FIELD)           | AMA EXECUTIVE AIRSTRIP              | NY | 28815  | 13009  | 0     | 0.31  |
| AMA EXECUTIVE AIRSTRIP              | SKY PORTEL                          | NY | 34720  | 6031   | 36    | 0.23* |
| SKY PORTEL                          | FRANKFORT-HIGHLAND INC.             | NY | 11229  | 21460  | 0     | 0.19  |
| FRANKFORT-HIGHLAND INC.             | DUFLO                               | NY | 23750  | 7752   | 0     | 0.25  |
| DUFLO                               | MICHAEL FIELD                       | NY | 7829   | 20421  | 0     | 0.16  |
| MICHAEL FIELD                       | PERRY-WARSAN                        | NY | 16986  | 10547  | 0     | 0.20  |
| PERRY-WARSAN                        | MAHOPAC                             | NY | 18005  | 7052   | 0     | 0.20  |
| MAHOPAC                             | CLARENCE AERODROME                  | NY | 17411  | 7571   | 0     | 0.19  |
| CLARENCE AERODROME                  |                                     | NY | 18612  | 6077   | 0     | 0.16  |

|     |      |                            |                 |          |         |       |        |        |
|-----|------|----------------------------|-----------------|----------|---------|-------|--------|--------|
| AEA | N72  | WARWICK MUNI               | WARWICK         | 18669.   | 6095.   | 0.    | 0.20   | 0.16   |
| AEA | NK03 | KAMP                       | DURHAMVILLE     | 16316.   | 5490.   | 0.    | 0.18   | 0.15   |
| AEA | D70  | HONEOYE FALLS              | HONEOYE FALLS   | 16555.   | 5405.   | 0.    | 0.17   | 0.15   |
| AEA | 8G3  | GIERMEK EXECUTIVE          | OLEAN           | 15836.   | 5169.   | 0.    | 0.16   | 0.14   |
| AEA | NY27 | FULCO                      | JOHNSTOWN       | 14944.   | 4878.   | 0.    | 0.16   | 0.13   |
| AEA | 23N  | EDWARDS                    | BAYPORT         | 9946.    | 8870.   | 0.    | 0.13   | 0.13   |
| AEA | 480  | SOUTH ALBANY               | SOUTH BETHLEHEM | 13078.   | 4270.   | 0.    | 0.14   | 0.12   |
| AEA | D38  | CANANDAIGUA                | CANANDAIGUA     | 12204.   | 3983.   | 0.    | 0.13   | 0.11   |
| AEA | NY55 | BURRELLO-MECHANICVILLE     | MECHANICVILLE   | 8905.    | 5417.   | 0.    | 0.10   | 0.10   |
| AEA | N89  | L.H.J./CHANNEL MASTER      | ELLENVILLE      | 6743.    | 7204.   | 0.    | 0.09   | 0.09   |
| AEA | NY20 | NELLIS FIELD               | FORT PLAIN      | 8012.    | 2615.   | 0.    | 0.09   | 0.07   |
| AEA | 9G5  | ROYALTON                   | GASPORT         | 8504.    | 2776.   | 0.    | 0.09   | 0.07   |
| AEA | N37  | MONTICELLO                 | MONTICELLO      | 7048.    | 2480.   | 6.    | 0.05*  | 0.06*  |
| AEA | B01  | GRANVILLE                  | GRANVILLE       | 6513.    | 2597.   | 0.    | 0.07   | 0.06   |
| AEA | PTD  | POTS DAM MUNI/DAMON FLD/   | POTS DAM        | 6904.    | 2253.   | 0.    | 0.07   | 0.06   |
| AEA | 4N2  | CHENANGO BRIDGE            | BINGHANTON      | 6505.    | 2123.   | 0.    | 0.07   | 0.06   |
| AEA | 481  | DUANESBURG                 | DUANESBURG      | 6734.    | 2199.   | 0.    | 0.07   | 0.06   |
| AEA | 7N2  | PEEKSKILL                  | PEEKSKILL       | 5354.    | 1748.   | 0.    | 0.06   | 0.05   |
| AEA | D80  | PALMER                     | OLCOIT          | 5117.    | 1670.   | 0.    | 0.05   | 0.05   |
| AEA | B16  | WHITFORDS                  | WEEDSPORT       | 5592.    | 1825.   | 0.    | 0.06   | 0.05   |
| AEA | NY23 | RYDERS SKYPORT             | GOVERNOUR       | 2205.    | 3230.   | 0.    | 0.03   | 0.04   |
| AEA | 4IN  | FEF AIRPARK INC.           | ONEONTA         | 3710.    | 696.    | 3.    | 0.02*  | 0.03*  |
| AEA | NY54 | COOPERSTOWN-WESTVILLE      | WESTVILLE       | 2384.    | 1779.   | 0.    | 0.03   | 0.03   |
| AEA | D79  | DART                       | HAYVILLE        | 1894.    | 618.    | 0.    | 0.02   | 0.02   |
| AEA | IN2  | SPADARO                    | EAST MORICHES   | 2073.    | 677.    | 0.    | 0.02   | 0.02   |
| AEA | NY03 | ATHENS                     | ATHENS          | 935.     | 305.    | 0.    | 0.01   | 0.01   |
| AEA | G08  | ROSTRAVER                  | MONONGAHELA     | 1582569. | 315030. | 1544. | 10.04* | 12.61* |
| AEA | N25  | BOB SHANNON MEMORIAL FIELD | DOWNTOWN        | 1119470. | 227241. | 1060. | 6.98*  | 8.95*  |
| AEA | 40N  | CHESTER COUNTY G O CARLSON | COATESVILLE     | 853697.  | 255518. | 853.  | 4.45   | 7.37   |
| AEA | IN9  | ALLEN TOWN QUEEN CITY MUNI | ALLEN TOWN      | 763764.  | 211316. | 732.  | 4.98*  | 6.48*  |
| AEA | LBE  | WESTMORELAND COUNTY        | LATROBE         | 719481.  | 226791. | 771.  | 6.49*  | 6.29*  |
| AEA | JST  | JOHNSTOWN-CAMBRIA COUNTY   | JOHNSTOWN       | 638572.  | 201590. | 793.  | 2.16   | 5.58   |
| AEA | N67  | WINGS FIELD                | PHILADELPHIA    | 538121.  | 216958. | 408.  | 3.70   | 5.02   |
| AEA | G01  | BEAVER COUNTY              | BEAVER FALLS    | 497904.  | 193863. | 481.  | 3.49*  | 4.60*  |
| AEA | BTP  | BUTLER-GRAHAM              | BUTLER          | 527346.  | 153260. | 402.  | 3.65*  | 4.52*  |
| AEA | N10  | PERKIOMEN VALLEY           | COLLEGEVILLE    | 524507.  | 129302. | 524.  | 2.43   | 4.34   |
| AEA | DUJ  | DU BOIS-JEFFERSON COUNTY   | DU BOIS         | 445567.  | 172018. | 512.  | 1.56   | 4.10   |
| AEA | 3G2  | WASHINGTON COUNTY          | WASHINGTON      | 411433.  | 186666. | 371.  | 3.27*  | 3.97*  |
| AEA | N57  | THE NEW GARDEN FLYING FLD  | TOUGHKENAMON    | 436355.  | 106074. | 398.  | 2.31   | 3.60   |
| AEA | UKT  | QUAKERTOWN                 | QUAKERTOWN      | 370687.  | 168623. | 360.  | 2.44   | 3.58   |
| AEA | BFD  | BRADFORD REGIONAL          | BRADFORD        | 387965.  | 151560. | 447.  | 1.27   | 3.58   |
| AEA | N88  | DOYLESTOWN                 | DOYLESTOWN      | 375123.  | 159362. | 328.  | 2.41   | 3.55   |
| AEA | N34  | TURNER FIELD               | PROSPECTVILLE   | 338315.  | 194751. | 137.  | 3.16   | 3.54   |
| AEA | THV  | YORK                       | YORK            | 419625.  | 113334. | 413.  | 2.79*  | 3.54*  |
| AEA | A00  | ALTOONA-BLAIR COUNTY       | ALTOONA         | 363102.  | 166138. | 391.  | 3.19*  | 3.52*  |
| AEA | N46  | POTTSTOWN LIMERICK         | POTTSTOWN       | 270734.  | 165034. | 186.  | 2.42*  | 2.90*  |
| AEA | N47  | POTTSTOWN MUNI             | POTTSTOWN       | 239879.  | 147251. | 235.  | 1.94*  | 2.57*  |
| AEA | N43  | EASTON                     | EASTON          | 264348.  | 118418. | 238.  | 1.78*  | 2.54*  |
| AEA | FKL  | CHESS-LAMBERTON            | FRANKLIN        | 227968.  | 139665. | 248.  | 0.98   | 2.43*  |
| AEA | 2G7  | NEW CASTLE MUNI            | NEW CASTLE      | 228980.  | 76468.  | 247.  | 1.91*  | 2.43*  |
| AEA | 2G9  | SOMERSET COUNTY            | SOMERSET        | 264440.  | 86029.  | 277.  | 1.07   | 2.33   |
| AEA | 2G6  | PORT MEADVILLE             | MEADVILLE       | 175753.  | 117245. | 178.  | 0.91   | 1.95   |
| AEA | H2L  | HAZLETON MUNI              | HAZLETON        | 197516.  | 84497.  | 194.  | 1.19   | 1.87   |
| AEA | 8G4  | CAMPBELL                   | PITTSBURGH      | 212331.  | 63358.  | 200.  | 0.94   | 1.83   |
| AEA | PSB  | MID-STATE                  | PHILIPSBURG     | 137727.  | 127486. | 145.  | 1.12   | 1.76   |
| AEA | UNV  | UNIVERSITY PARK            | STATE COLLEGE   | 100650.  | 138214. | 0.    | 1.50   | 1.59   |
| AEA | MPO  | POCONO MOUNTAINS MUNI      | MT POCONO       | 156764.  | 78615.  | 146.  | 1.14   | 1.56   |
| AEA | N65  | 3-M                        | BRISTOL         | 140062.  | 84782.  | 101.  | 1.10*  | 1.49*  |
| AEA | LHV  | W T PIPER MEML             | LOCK HAVEN      | 156793.  | 51178.  | 0.    | 1.62   | 1.38   |

|     |      |                                   |                   |    |         |         |      |       |       |
|-----|------|-----------------------------------|-------------------|----|---------|---------|------|-------|-------|
| AEA | SEG  | PENN VALLEY                       | SELINGSGROVE      | PA | 111315. | 81234.  | 97.  | 0.91* | 1.28* |
| AEA | 430  | CHERRY RIDGE                      | HONESDALE         | PA | 155675. | 35683.  | 130. | 1.01* | 1.27* |
| AEA | 460  | 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 | 46934.  | 120732. | 0.   | 1.38  | 1.11  |
| AEA | N27  | TOWANDA                           | TOWANDA           | PA | 37009.  | 111833. | 67.  | 0.96  | 0.99  |
| AEA | N34  | 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  | CONNELLVILLE                      | CONNELLVILLE      | PA | 100642. | 33959.  | 1.   | 1.67  | 0.89  |
| AEA | 9N1  | VANSANT                           | ERVINNA           | 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 | 4G9  | 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-SCOTTDAL           | 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  | BELLEFONT SKYPARK                 | BELLEFONT         | 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  | BUTTER VALLEY GOLF PORT           | IRWIN             | PA | 20749.  | 6774.   | 0.   | 0.21  | 0.18  |
| AEA | 7N8  | DEVENER                           | BALLY             | PA | 18963.  | 6189.   | 0.   | 0.19  | 0.17  |
| AEA | 2W7  | SKYHAVEN                          | HANOVER           | PA | 19153.  | 6253.   | 0.   | 0.20  | 0.17  |
| AEA | 6W7  | BATTLEFIELD                       | TUNKHANNOCK       | PA | 12330.  | 12324.  | 0.   | 0.15  | 0.16  |
| AEA | 57N  | OXFORD                            | GETTYSBURG        | PA | 16109.  | 5260.   | 0.   | 0.16  | 0.14  |
| AEA | 7G3  | LEECHBURG                         | OXFORD            | PA | 15528.  | 5069.   | 0.   | 0.16  | 0.14  |
| AEA | N71  | ELIZABETHTOWN-MARIETTA INC        | LEECHBURG         | PA | 14370.  | 4692.   | 0.   | 0.14  | 0.13  |
| AEA | N05  | DOERSOM                           | MT JOY /MARIETTA/ | PA | 14625.  | 4773.   | 0.   | 0.15  | 0.13  |
| AEA | 9W8  | BAUBLITZ COMMERCIAL               | GETTYSBURG        | PA | 15035.  | 4909.   | 0.   | 0.15  | 0.13  |
| AEA | 9N3  | SEAMANS FLD                       | BROGUE            | PA | 14534.  | 4745.   | 0.   | 0.15  | 0.13  |
| AEA | SCE  | STATE COLLEGE AIR DEPOT           | FACTORYVILLE      | PA | 9163.   | 8507.   | 0.   | 0.11  | 0.12  |
| AEA | 22D  | BANDEL                            | STATE COLLEGE     | PA | 14311.  | 2722.   | 13.  | 0.04* | 0.11* |
| AEA | 89N  | CENTRAL MANOR                     | EIGHTY FOUR       | PA | 10100.  | 5506.   | 0.   | 0.11  | 0.10  |
| AEA | 26D  | KEYSTONE PARK                     | MOUNTVILLE        | PA | 11476.  | 3747.   | 0.   | 0.12  | 0.10  |
|     |      |                                   | EMPORIUM          | PA | 9975.   | 3256.   | 0.   | 0.10  | 0.09  |

|           |                                   |    |          |         |      |       |       |
|-----------|-----------------------------------|----|----------|---------|------|-------|-------|
| AEA N16   | CENTRE AIRPARK                    | PA | 8617.    | 2813.   | 0.   | 0.09  | 0.08  |
| AEA G06   | MC VILLE                          | PA | 8360.    | 2893.   | 0.   | 0.09  | 0.08  |
| AEA N35   | PUNXSUTAWNEY                      | PA | 9067.    | 2960.   | 0.   | 0.09  | 0.08  |
| AEA PA11  | BROKENSTRAW                       | PA | 7783.    | 4749.   | 0.   | 0.09  | 0.08  |
| AEA PA22  | HERMITAGE                         | PA | 8755.    | 2858.   | 0.   | 0.09  | 0.08  |
| AEA PA23  | MIFFLINTOWN                       | PA | 8445.    | 3301.   | 0.   | 0.09  | 0.08  |
| AEA 07N   | BERMUDIAN VALLEY AIRPARK          | PA | 8842.    | 2886.   | 0.   | 0.09  | 0.08  |
| AEA PA08  | MOORHEAD AIRPARK                  | PA | 7922.    | 2586.   | 0.   | 0.08  | 0.07  |
| AEA 69N   | SLATINGTON                        | PA | 8034.    | 2622.   | 0.   | 0.08  | 0.07  |
| AEA PA17  | SENECA AIRPARK INC                | PA | 7158.    | 2337.   | 0.   | 0.07  | 0.06  |
| AEA N42   | SHIPPENSBURG                      | PA | 6832.    | 2247.   | 0.   | 0.07  | 0.06  |
| AEA N32   | BLUE SWAN                         | PA | 5917.    | 1932.   | 0.   | 0.06  | 0.05  |
| AEA 8N8   | DANVILLE                          | PA | 5968.    | 1948.   | 0.   | 0.06  | 0.05  |
| AEA 7G4   | BLUE KNOB VALLEY                  | PA | 5508.    | 1798.   | 0.   | 0.06  | 0.05  |
| AEA PA06  | LAKEHILL                          | PA | 6110.    | 1995.   | 0.   | 0.06  | 0.05  |
| AEA 9N9   | HALLSTEAD                         | PA | 1429.    | 3005.   | 0.   | 0.02  | 0.03  |
| AEA 1N3   | ALBERT                            | PA | 3599.    | 1208.   | 0.   | 0.04  | 0.03  |
| AEA 42N   | LEBANON VALLEY AIRPARK            | PA | 2974.    | 971.    | 0.   | 0.03  | 0.03  |
| AEA 74N   | BENDIGO                           | PA | 3694.    | 1206.   | 0.   | 0.04  | 0.03  |
| AEA 70N   | SPRING HILL AIRPARK               | PA | 2154.    | 703.    | 0.   | 0.02  | 0.02  |
| AEA 8N6   | CARBONDALE-CLIFFORD               | PA | 1798.    | 587.    | 0.   | 0.02  | 0.02  |
| AEA 71N   | SUNDURY                           | PA | 1623.    | 530.    | 0.   | 0.02  | 0.01  |
| AEA 7SP   | SEVEN SPRINGS                     | PA | 0.       | 76.     | 0.   | 0.00  | 0.00  |
| AEA W09   | LEESBURG MUNI/GODFREY/FIELD       | VA | 1066712. | 197364. | 907. | 7.71  | 8.40  |
| AEA W98   | CHESTERFIELD COUNTY               | VA | 934683.  | 183265. | 905. | 5.20  | 7.43  |
| AEA W07   | SHANNON                           | VA | 656279.  | 196520. | 604. | 4.57  | 5.67  |
| AEA SHD   | SHENANDOAH VALLEY                 | VA | 527132.  | 191875. | 544. | 3.36  | 4.78  |
| AEA W10   | MANASSAS MUNI/HARRY P DAVIS FIELD | VA | 346883.  | 208016. | 0.   | 13.54 | 3.69  |
| AEA LNP   | LONESOME PINE                     | VA | 218198.  | 139998. | 212. | 1.62  | 2.38  |
| AEA MFV   | ACCOMACK COUNTY                   | VA | 282814.  | 72845.  | 276. | 1.81  | 2.36  |
| AEA W83   | HANOVER COUNTY MUNI               | VA | 224220.  | 65403.  | 175. | 2.05  | 1.92  |
| AEA PVG   | CHESAPEAKE PORTSMOUTH             | VA | 168447.  | 112262. | 0.   | 6.60  | 1.87  |
| AEA FKN   | FRANKLIN MUNI-JOHN BEVERLY ROSE   | VA | 235048.  | 46088.  | 232. | 1.91  | 1.87  |
| AEA W66   | WARRENTON-FAUQUIER                | VA | 197444.  | 63401.  | 131. | 1.49  | 1.73  |
| AEA PTB   | PETERSBURG MUNI                   | VA | 219761.  | 36756.  | 210. | 1.06  | 1.70  |
| AEA W70   | WILLIAMSBURG-JAMESTOWN            | VA | 152579.  | 78456.  | 0.   | 5.28  | 1.54  |
| AEA PSK   | NEW RIVER VALLEY                  | VA | 135323.  | 83348.  | 126. | 0.85  | 1.45  |
| AEA DAN   | DANVILLE MUNI                     | VA | 147224.  | 59486.  | 0.   | 1.32  | 1.37  |
| AEA HSP   | INGALLS FIELD                     | VA | 98468.   | 79907.  | 84.  | 0.88  | 1.19  |
| AEA W89   | HOPEWELL                          | VA | 151314.  | 25898.  | 141. | 0.83  | 1.18  |
| AEA W22   | WOODBIDGE                         | VA | 122746.  | 48470.  | 0.   | 1.23  | 1.14  |
| AEA SA1   | MOUNTAIN EMPIRE                   | VA | 110282.  | 59134.  | 99.  | 0.75* | 1.13* |
| AEA SFQ   | SUFFOLK MUNI                      | VA | 54441.   | 113941. | 0.   | 1.91  | 1.12  |
| AEA GVE   | GORDONSVILLE MUNI                 | VA | 129155.  | 27884.  | 122. | 0.88* | 1.04* |
| AEA W16   | WINCHESTER MUNI                   | VA | 70936.   | 53874.  | 0.   | 1.92  | 0.83  |
| AEA W92   | SKY BRYCE                         | VA | 27592.   | 36719.  | 0.   | 0.52  | 0.76  |
| AEA W48   | VIRGINIA HIGHLANDS                | VA | 37284.   | 68987.  | 0.   | 1.24  | 0.71  |
| AEA W13   | WAYNESBORO                        | VA | 14565.   | 86528.  | 0.   | 0.41  | 0.67  |
| AEA TGI   | TANGIER ISLAND                    | VA | 20519.   | 74562.  | 0.   | 0.41  | 0.63  |
| AEA W49   | CULPEPER MUNI T.I. MARTIN FIELD   | VA | 52338.   | 31428.  | 0.   | 1.39  | 0.56  |
| AEA W93   | ORANGE COUNTY                     | VA | 42056.   | 42382.  | 0.   | 0.50  | 0.56  |
| AEA W97   | WEST POINT MUNI                   | VA | 56980.   | 20807.  | 53.  | 0.42* | 0.52* |
| AEA V P I | V P I                             | VA | 28051.   | 46724.  | 0.   | 1.34  | 0.50  |
| AEA W04   | FALWELL                           | VA | 14253.   | 59538.  | 0.   | 0.31  | 0.49  |
| AEA W08   | WILLIAM M TUCK                    | VA | 30219.   | 37875.  | 0.   | 0.98  | 0.45  |
| AEA W91   | SMITH MOUNTAIN LAKE               | VA | 15602.   | 50286.  | 0.   | 0.29  | 0.44  |
| AEA W93   | SCUTH NORFOLK                     | VA | 48306.   | 15768.  | 0.   | 0.47  | 0.43  |
| AEA W93   | EMPORIA MUNI                      | VA | 25093.   | 37489.  | 0.   | 1.12  | 0.42  |
| AEA W93   | BLUE RIDGE                        | VA | 40123.   | 22741.  | 135. | 0.94  | 0.42  |
| AEA W93   | CENTRE HALL                       | PA | 8617.    | 2813.   | 0.   | 0.09  | 0.08  |
| AEA W93   | FREPORT                           | PA | 8360.    | 2893.   | 0.   | 0.09  | 0.08  |
| AEA W93   | PUNXSUTAWNEY                      | PA | 9067.    | 2960.   | 0.   | 0.09  | 0.08  |
| AEA W93   | PITTSFIELD                        | PA | 7783.    | 4749.   | 0.   | 0.09  | 0.08  |
| AEA W93   | SHARON                            | PA | 8755.    | 2858.   | 0.   | 0.09  | 0.08  |
| AEA W93   | MIFFLINTOWN                       | PA | 8445.    | 3301.   | 0.   | 0.09  | 0.08  |
| AEA W93   | KRALLTOWN                         | PA | 8842.    | 2886.   | 0.   | 0.09  | 0.08  |
| AEA W93   | NORTH EAST                        | PA | 7922.    | 2586.   | 0.   | 0.08  | 0.07  |
| AEA W93   | SLATINGTON                        | PA | 8034.    | 2622.   | 0.   | 0.08  | 0.07  |
| AEA W93   | SENECA                            | PA | 7158.    | 2337.   | 0.   | 0.07  | 0.06  |
| AEA W93   | SHIPPENSBURG                      | PA | 6832.    | 2247.   | 0.   | 0.07  | 0.06  |
| AEA W93   | SAYRE                             | PA | 5917.    | 1932.   | 0.   | 0.06  | 0.05  |
| AEA W93   | DANVILLE                          | PA | 5968.    | 1948.   | 0.   | 0.06  | 0.05  |
| AEA W93   | NEWRY                             | PA | 5508.    | 1798.   | 0.   | 0.06  | 0.05  |
| AEA W93   | MARS                              | PA | 6110.    | 1995.   | 0.   | 0.06  | 0.05  |
| AEA W93   | HALLSTEAD                         | PA | 1429.    | 3005.   | 0.   | 0.02  | 0.03  |
| AEA W93   | PHILIPSBURG                       | PA | 3599.    | 1208.   | 0.   | 0.04  | 0.03  |
| AEA W93   | MYERSTOWN                         | PA | 2974.    | 971.    | 0.   | 0.03  | 0.03  |
| AEA W93   | TOWER CITY                        | PA | 3694.    | 1206.   | 0.   | 0.04  | 0.03  |
| AEA W93   | STERLING                          | PA | 2154.    | 703.    | 0.   | 0.02  | 0.02  |
| AEA W93   | CARBONDALE                        | PA | 1798.    | 587.    | 0.   | 0.02  | 0.02  |
| AEA W93   | SUNBURY                           | PA | 1623.    | 530.    | 0.   | 0.02  | 0.01  |
| AEA W93   | SEVEN SPRINGS BOROUGH             | PA | 0.       | 76.     | 0.   | 0.00  | 0.00  |
| AEA W93   | LEESBURG                          | VA | 1066712. | 197364. | 907. | 7.71  | 8.40  |
| AEA W93   | CHESTERFIELD                      | VA | 934683.  | 183265. | 905. | 5.20  | 7.43  |
| AEA W93   | FREDERICKSBURG                    | VA | 656279.  | 196520. | 604. | 4.57  | 5.67  |
| AEA W93   | STAUNTON/WAYNESB/HARRI            | VA | 527132.  | 191875. | 544. | 3.36  | 4.78  |
| AEA W93   | MANASSAS                          | VA | 346883.  | 208016. | 0.   | 13.54 | 3.69  |
| AEA W93   | WISE                              | VA | 218198.  | 139998. | 212. | 1.62  | 2.38  |
| AEA W93   | MELFA                             | VA | 282814.  | 72845.  | 276. | 1.81  | 2.36  |
| AEA W93   | ASHLAND                           | VA | 224220.  | 65403.  | 175. | 2.05  | 1.92  |
| AEA W93   | PORTSMOUTH                        | VA | 168447.  | 112262. | 0.   | 6.60  | 1.87  |
| AEA W93   | FRANKLIN                          | VA | 235048.  | 46088.  | 232. | 1.91  | 1.87  |
| AEA W93   | MIDLAND                           | VA | 197444.  | 63401.  | 131. | 1.49  | 1.73  |
| AEA W93   | PETERSBURG                        | VA | 219761.  | 36756.  | 210. | 1.06  | 1.70  |
| AEA W93   | WILLIAMSBURG/JAMESTOWN            | VA | 152579.  | 78456.  | 0.   | 5.28  | 1.54  |
| AEA W93   | DUBLIN                            | VA | 135323.  | 83348.  | 126. | 0.85  | 1.45  |
| AEA W93   | DANVILLE                          | VA | 147224.  | 59486.  | 0.   | 1.32  | 1.37  |
| AEA W93   | HOT SPRINGS                       | VA | 98468.   | 79907.  | 84.  | 0.88  | 1.19  |
| AEA W93   | HOPEWELL                          | VA | 151314.  | 25898.  | 141. | 0.83  | 1.18  |
| AEA W93   | WOODBIDGE                         | VA | 122746.  | 48470.  | 0.   | 1.23  | 1.14  |
| AEA W93   | MARION/WYTHEVILLE                 | VA | 110282.  | 59134.  | 99.  | 0.75* | 1.13* |
| AEA W93   | SUFFOLK                           | VA | 54441.   | 113941. | 0.   | 1.91  | 1.12  |
| AEA W93   | GORDONSVILLE                      | VA | 129155.  | 27884.  | 122. | 0.88* | 1.04* |
| AEA W93   | WINCHESTER                        | VA | 70936.   | 53874.  | 0.   | 1.92  | 0.83  |
| AEA W93   | BAYE                              | VA | 27592.   | 36719.  | 0.   | 0.52  | 0.76  |
| AEA W93   | ABINGDON                          | VA | 37284.   | 68987.  | 0.   | 1.24  | 0.71  |
| AEA W93   | WAYNESBORO                        | VA | 14565.   | 86528.  | 0.   | 0.41  | 0.67  |
| AEA W93   | TANGIER                           | VA | 20519.   | 74562.  | 0.   | 0.41  | 0.63  |
| AEA W93   | CULPEPER                          | VA | 52338.   | 31428.  | 0.   | 1.39  | 0.56  |
| AEA W93   | ORANGE                            | VA | 42056.   | 42382.  | 0.   | 0.50  | 0.56  |
| AEA W93   | WEST POINT                        | VA | 56980.   | 20807.  | 53.  | 0.42* | 0.52* |
| AEA W93   | BLACKSBURG                        | VA | 28051.   | 46724.  | 0.   | 1.34  | 0.50  |
| AEA W93   | LYNCHBURG                         | VA | 14253.   | 59538.  | 0.   | 0.31  | 0.49  |
| AEA W93   | SOUTH BOSTON                      | VA | 30219.   | 37875.  | 0.   | 0.98  | 0.45  |
| AEA W93   | MONEIA                            | VA | 15602.   | 50286.  | 0.   | 0.29  | 0.44  |
| AEA W93   | CHESAPEAKE                        | VA | 48306.   | 15768.  | 0.   | 0.47  | 0.43  |
| AEA W93   | EMPORIA                           | VA | 25093.   | 37489.  | 0.   | 1.12  | 0.42  |
| AEA W93   | MARTINSVILLE                      | VA | 40123.   | 22741.  | 135. | 0.94  | 0.42  |

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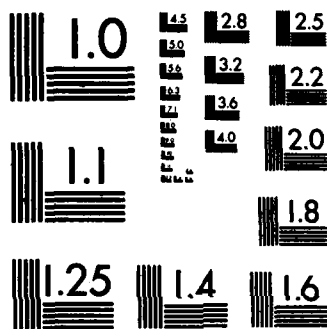
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| AEA | W90 | NEW LONDON                          | FOREST                | VA | 41991  | 13708  | 0   | 0.40 | 0.37 |
|-----|-----|-------------------------------------|-----------------------|----|--------|--------|-----|------|------|
| AEA | GDY | 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 | 73836  | 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 <td>LOT <td>LEWIS UNIVERSITY <td>ROMBOVILLE <td>IL <td>1982273</td> <td>385352</td> <td>2009</td> <td>10.20</td> <td>15.73</td> </td></td></td></td>                        | LOT <td>LEWIS UNIVERSITY <td>ROMBOVILLE <td>IL <td>1982273</td> <td>385352</td> <td>2009</td> <td>10.20</td> <td>15.73</td> </td></td></td>                        | LEWIS UNIVERSITY <td>ROMBOVILLE <td>IL <td>1982273</td> <td>385352</td> <td>2009</td> <td>10.20</td> <td>15.73</td> </td></td>                        | ROMBOVILLE <td>IL <td>1982273</td> <td>385352</td> <td>2009</td> <td>10.20</td> <td>15.73</td> </td>     | IL <td>1982273</td> <td>385352</td> <td>2009</td> <td>10.20</td> <td>15.73</td> | 1982273 | 385352 | 2009 | 10.20 | 15.73 |
| AGL <td>JOT <td>JOLIET MUNI <td>JOLIET <td>IL <td>1195687</td> <td>273011</td> <td>1260</td> <td>6.62</td> <td>9.76</td> </td></td></td></td>                                   | JOT <td>JOLIET MUNI <td>JOLIET <td>IL <td>1195687</td> <td>273011</td> <td>1260</td> <td>6.62</td> <td>9.76</td> </td></td></td>                                   | JOLIET MUNI <td>JOLIET <td>IL <td>1195687</td> <td>273011</td> <td>1260</td> <td>6.62</td> <td>9.76</td> </td></td>                                   | JOLIET <td>IL <td>1195687</td> <td>273011</td> <td>1260</td> <td>6.62</td> <td>9.76</td> </td>           | IL <td>1195687</td> <td>273011</td> <td>1260</td> <td>6.62</td> <td>9.76</td>   | 1195687 | 273011 | 1260 | 6.62  | 9.76  |
| AGL <td>UIN <td>QUINCY MUNI BALDWIN FIELD <td>QUINCY <td>IL <td>1007667</td> <td>268312</td> <td>1088</td> <td>6.17</td> <td>8.48</td> </td></td></td></td>                     | UIN <td>QUINCY MUNI BALDWIN FIELD <td>QUINCY <td>IL <td>1007667</td> <td>268312</td> <td>1088</td> <td>6.17</td> <td>8.48</td> </td></td></td>                     | QUINCY MUNI BALDWIN FIELD <td>QUINCY <td>IL <td>1007667</td> <td>268312</td> <td>1088</td> <td>6.17</td> <td>8.48</td> </td></td>                     | QUINCY <td>IL <td>1007667</td> <td>268312</td> <td>1088</td> <td>6.17</td> <td>8.48</td> </td>           | IL <td>1007667</td> <td>268312</td> <td>1088</td> <td>6.17</td> <td>8.48</td>   | 1007667 | 268312 | 1088 | 6.17  | 8.48  |
| AGL <td>MVN <td>MT VERNON-OUTLAND <td>MT VERNON <td>IL <td>928502</td> <td>248997</td> <td>1058</td> <td>6.10</td> <td>7.82</td> </td></td></td></td>                           | MVN <td>MT VERNON-OUTLAND <td>MT VERNON <td>IL <td>928502</td> <td>248997</td> <td>1058</td> <td>6.10</td> <td>7.82</td> </td></td></td>                           | MT VERNON-OUTLAND <td>MT VERNON <td>IL <td>928502</td> <td>248997</td> <td>1058</td> <td>6.10</td> <td>7.82</td> </td></td>                           | MT VERNON <td>IL <td>928502</td> <td>248997</td> <td>1058</td> <td>6.10</td> <td>7.82</td> </td>         | IL <td>928502</td> <td>248997</td> <td>1058</td> <td>6.10</td> <td>7.82</td>    | 928502  | 248997 | 1058 | 6.10  | 7.82  |
| AGL <td>IKK <td>GREATER KANKAKEE <td>KANKAKEE <td>IL <td>828557</td> <td>154896</td> <td>865</td> <td>4.04</td> <td>6.53</td> </td></td></td></td>                              | IKK <td>GREATER KANKAKEE <td>KANKAKEE <td>IL <td>828557</td> <td>154896</td> <td>865</td> <td>4.04</td> <td>6.53</td> </td></td></td>                              | GREATER KANKAKEE <td>KANKAKEE <td>IL <td>828557</td> <td>154896</td> <td>865</td> <td>4.04</td> <td>6.53</td> </td></td>                              | KANKAKEE <td>IL <td>828557</td> <td>154896</td> <td>865</td> <td>4.04</td> <td>6.53</td> </td>           | IL <td>828557</td> <td>154896</td> <td>865</td> <td>4.04</td> <td>6.53</td>     | 828557  | 154896 | 865  | 4.04  | 6.53  |
| AGL <td>C06 <td>ELGIN <td>ELGIN <td>IL <td>694207</td> <td>228636</td> <td>623</td> <td>4.35</td> <td>6.13</td> </td></td></td></td>                                            | C06 <td>ELGIN <td>ELGIN <td>IL <td>694207</td> <td>228636</td> <td>623</td> <td>4.35</td> <td>6.13</td> </td></td></td>                                            | ELGIN <td>ELGIN <td>IL <td>694207</td> <td>228636</td> <td>623</td> <td>4.35</td> <td>6.13</td> </td></td>                                            | ELGIN <td>IL <td>694207</td> <td>228636</td> <td>623</td> <td>4.35</td> <td>6.13</td> </td>              | IL <td>694207</td> <td>228636</td> <td>623</td> <td>4.35</td> <td>6.13</td>     | 694207  | 228636 | 623  | 4.35  | 6.13  |
| AGL <td>LWV <td>LAWRENCEVILLE-VINCENNES MUNI <td>LAWRENCEVILLE <td>IL <td>725586</td> <td>167027</td> <td>721</td> <td>4.79</td> <td>5.93</td> </td></td></td></td>             | LWV <td>LAWRENCEVILLE-VINCENNES MUNI <td>LAWRENCEVILLE <td>IL <td>725586</td> <td>167027</td> <td>721</td> <td>4.79</td> <td>5.93</td> </td></td></td>             | LAWRENCEVILLE-VINCENNES MUNI <td>LAWRENCEVILLE <td>IL <td>725586</td> <td>167027</td> <td>721</td> <td>4.79</td> <td>5.93</td> </td></td>             | LAWRENCEVILLE <td>IL <td>725586</td> <td>167027</td> <td>721</td> <td>4.79</td> <td>5.93</td> </td>      | IL <td>725586</td> <td>167027</td> <td>721</td> <td>4.79</td> <td>5.93</td>     | 725586  | 167027 | 721  | 4.79  | 5.93  |
| AGL <td>MT0 <td>COLES COUNTY MEMORIAL <td>MATTOON-CHARLESTON <td>IL <td>681951</td> <td>201816</td> <td>719</td> <td>3.57</td> <td>5.87</td> </td></td></td></td>               | MT0 <td>COLES COUNTY MEMORIAL <td>MATTOON-CHARLESTON <td>IL <td>681951</td> <td>201816</td> <td>719</td> <td>3.57</td> <td>5.87</td> </td></td></td>               | COLES COUNTY MEMORIAL <td>MATTOON-CHARLESTON <td>IL <td>681951</td> <td>201816</td> <td>719</td> <td>3.57</td> <td>5.87</td> </td></td>               | MATTOON-CHARLESTON <td>IL <td>681951</td> <td>201816</td> <td>719</td> <td>3.57</td> <td>5.87</td> </td> | IL <td>681951</td> <td>201816</td> <td>719</td> <td>3.57</td> <td>5.87</td>     | 681951  | 201816 | 719  | 3.57  | 5.87  |
| AGL <td>3HA <td>LANSING MUNICIPAL <td>CHICAGO <td>IL <td>610105</td> <td>216021</td> <td>553</td> <td>4.08</td> <td>5.49</td> </td></td></td></td>                              | 3HA <td>LANSING MUNICIPAL <td>CHICAGO <td>IL <td>610105</td> <td>216021</td> <td>553</td> <td>4.08</td> <td>5.49</td> </td></td></td>                              | LANSING MUNICIPAL <td>CHICAGO <td>IL <td>610105</td> <td>216021</td> <td>553</td> <td>4.08</td> <td>5.49</td> </td></td>                              | CHICAGO <td>IL <td>610105</td> <td>216021</td> <td>553</td> <td>4.08</td> <td>5.49</td> </td>            | IL <td>610105</td> <td>216021</td> <td>553</td> <td>4.08</td> <td>5.49</td>     | 610105  | 216021 | 553  | 4.08  | 5.49  |
| AGL <td>C18 <td>FRANKFORT <td>FRANKFORT <td>IL <td>680957</td> <td>130450</td> <td>723</td> <td>3.03</td> <td>5.39</td> </td></td></td></td>                                    | C18 <td>FRANKFORT <td>FRANKFORT <td>IL <td>680957</td> <td>130450</td> <td>723</td> <td>3.03</td> <td>5.39</td> </td></td></td>                                    | FRANKFORT <td>FRANKFORT <td>IL <td>680957</td> <td>130450</td> <td>723</td> <td>3.03</td> <td>5.39</td> </td></td>                                    | FRANKFORT <td>IL <td>680957</td> <td>130450</td> <td>723</td> <td>3.03</td> <td>5.39</td> </td>          | IL <td>680957</td> <td>130450</td> <td>723</td> <td>3.03</td> <td>5.39</td>     | 680957  | 130450 | 723  | 3.03  | 5.39  |
| AGL <td>3CK <td>CRYSTAL LAKE <td>CRYSTAL LAKE <td>IL <td>554221</td> <td>203193</td> <td>455</td> <td>3.31</td> <td>5.03</td> </td></td></td></td>                              | 3CK <td>CRYSTAL LAKE <td>CRYSTAL LAKE <td>IL <td>554221</td> <td>203193</td> <td>455</td> <td>3.31</td> <td>5.03</td> </td></td></td>                              | CRYSTAL LAKE <td>CRYSTAL LAKE <td>IL <td>554221</td> <td>203193</td> <td>455</td> <td>3.31</td> <td>5.03</td> </td></td>                              | CRYSTAL LAKE <td>IL <td>554221</td> <td>203193</td> <td>455</td> <td>3.31</td> <td>5.03</td> </td>       | IL <td>554221</td> <td>203193</td> <td>455</td> <td>3.31</td> <td>5.03</td>     | 554221  | 203193 | 455  | 3.31  | 5.03  |
| AGL <td>C81 <td>CAMPBELL <td>GRAYS LAKE <td>IL <td>586917</td> <td>120497</td> <td>547</td> <td>3.58</td> <td>4.70</td> </td></td></td></td>                                    | C81 <td>CAMPBELL <td>GRAYS LAKE <td>IL <td>586917</td> <td>120497</td> <td>547</td> <td>3.58</td> <td>4.70</td> </td></td></td>                                    | CAMPBELL <td>GRAYS LAKE <td>IL <td>586917</td> <td>120497</td> <td>547</td> <td>3.58</td> <td>4.70</td> </td></td>                                    | GRAYS LAKE <td>IL <td>586917</td> <td>120497</td> <td>547</td> <td>3.58</td> <td>4.70</td> </td>         | IL <td>586917</td> <td>120497</td> <td>547</td> <td>3.58</td> <td>4.70</td>     | 586917  | 120497 | 547  | 3.58  | 4.70  |
| AGL <td>C16 <td>ILLINI <td>URBANA <td>IL <td>489226</td> <td>164880</td> <td>446</td> <td>3.36</td> <td>4.35</td> </td></td></td></td>                                          | C16 <td>ILLINI <td>URBANA <td>IL <td>489226</td> <td>164880</td> <td>446</td> <td>3.36</td> <td>4.35</td> </td></td></td>                                          | ILLINI <td>URBANA <td>IL <td>489226</td> <td>164880</td> <td>446</td> <td>3.36</td> <td>4.35</td> </td></td>                                          | URBANA <td>IL <td>489226</td> <td>164880</td> <td>446</td> <td>3.36</td> <td>4.35</td> </td>             | IL <td>489226</td> <td>164880</td> <td>446</td> <td>3.36</td> <td>4.35</td>     | 489226  | 164880 | 446  | 3.36  | 4.35  |
| AGL <td>SQI <td>WHITESIDE CO ARPT-JOS H BITTORF FLD <td>STERLING ROCKFALLS <td>IL <td>357599</td> <td>165446</td> <td>376</td> <td>2.19</td> <td>3.48</td> </td></td></td></td> | SQI <td>WHITESIDE CO ARPT-JOS H BITTORF FLD <td>STERLING ROCKFALLS <td>IL <td>357599</td> <td>165446</td> <td>376</td> <td>2.19</td> <td>3.48</td> </td></td></td> | WHITESIDE CO ARPT-JOS H BITTORF FLD <td>STERLING ROCKFALLS <td>IL <td>357599</td> <td>165446</td> <td>376</td> <td>2.19</td> <td>3.48</td> </td></td> | STERLING ROCKFALLS <td>IL <td>357599</td> <td>165446</td> <td>376</td> <td>2.19</td> <td>3.48</td> </td> | IL <td>357599</td> <td>165446</td> <td>376</td> <td>2.19</td> <td>3.48</td>     | 357599  | 165446 | 376  | 2.19  | 3.48  |

|     |      |                                      |                       |        |        |     |       |       |
|-----|------|--------------------------------------|-----------------------|--------|--------|-----|-------|-------|
| AGL | 3MY  | MOUNT HANLEY AUXILIARY               | PEORIA                | 389396 | 117939 | 382 | 2.66* | 3.37* |
| AGL | C77  | BELVIDERE LTD                        | BELVIDERE             | 316982 | 156924 | 290 | 2.25* | 3.15* |
| AGL | C56  | SANGER                               | MONEE                 | 397725 | 71510  | 393 | 2.45* | 3.12  |
| AGL | 10C  | GALT FIELD                           | GREENWOOD/WONDER LAKE | 327421 | 118153 | 310 | 2.27* | 2.96* |
| AGL | SLO  | SALEM-LECKRONE                       | SALEM                 | 275834 | 121688 | 270 | 2.13  | 2.64  |
| AGL | ENL  | CENTRALIA MUNI                       | CENTRALIA             | 271574 | 123770 | 280 | 1.82  | 2.63  |
| AGL | 1C5  | CLOW INTL                            | PLAINFIELD            | 235867 | 149355 | 0   | 2.66  | 2.56  |
| AGL | RSV  | ROBINSON MUNI                        | ROBINSON              | 301957 | 80488  | 312 | 2.12  | 2.54  |
| AGL | FEP  | THE ALBERTUS                         | FREPORT               | 298911 | 69176  | 308 | 1.61  | 2.45  |
| AGL | 12C  | ROCHELLE MUN                         | ROCHELLE              | 280115 | 58893  | 280 | 1.84* | 2.25* |
| AGL | IJX  | JACKSONVILLE MUNI                    | JACKSONVILLE          | 179372 | 139787 | 160 | 1.65  | 2.12  |
| AGL | 3HW  | HOMELL                               | CHICAGO/BLUE ISLAND/  | 162755 | 146188 | 0   | 2.00  | 2.05  |
| AGL | C73  | DIXON MUNI-CHARLES R. WALGREEN FIELD | DIXON                 | 230479 | 57254  | 229 | 1.53* | 1.91* |
| AGL | C09  | MORRIS MUNI                          | MORRIS                | 167859 | 87846  | 165 | 1.27* | 1.70* |
| AGL | C15  | PEKIN MUNI                           | PEKIN                 | 102975 | 38976  | 0   | 3.65  | 1.61  |
| AGL | C45  | WADDELL                              | MANITO                | 193624 | 35511  | 195 | 1.26* | 1.56* |
| AGL | DLY  | OLNEY-NOBLE                          | OLNEY-NOBLE           | 115632 | 114319 | 109 | 1.21  | 1.53  |
| AGL | 06C  | CHICAGO/SCHAUMBURG                   | CHICAGO/SCHAUMBURG    | 100005 | 125712 | 0   | 1.41  | 1.50  |
| AGL | HSB  | HARRISBURG-RALEIGH                   | HARRISBURG            | 159000 | 62836  | 152 | 1.35  | 1.47  |
| AGL | 3LC  | LOGAN COUNTY                         | LINCOLN               | 163524 | 43793  | 160 | 1.10  | 1.32  |
| AGL | 0C0  | DACY                                 | HARVARD               | 149915 | 48935  | 0   | 1.59  | 1.32  |
| AGL | SAR  | SPARTA COMMUNITY-HUNTER FIELD        | SPARTA                | 138244 | 52038  | 0   | 0.32  | 1.26  |
| AGL | 3K6  | SHAFFER METRO EAST                   | ST JACOB              | 107610 | 68335  | 0   | 1.21  | 1.17  |
| AGL | 2H3  | FAIRFIELD MUNI                       | FAIRFIELD             | 128616 | 35124  | 110 | 0.90  | 1.09  |
| AGL | 1H8  | CASEY MUNI                           | CASEY                 | 102893 | 46905  | 72  | 0.82  | 1.00  |
| AGL | C75  | MARSHALL COUNTY                      | LACON                 | 116265 | 25376  | 115 | 0.77* | 0.94* |
| AGL | 2H0  | SHELBY COUNTY                        | SHELBYVILLE           | 38161  | 70368  | 0   | 0.62  | 0.72  |
| AGL | 1M0  | CAIRO                                | CAIRO                 | 24310  | 83144  | 0   | 0.54  | 0.71  |
| AGL | VLA  | VANDALIA MUNI                        | VANDALIA              | 81966  | 24263  | 80  | 0.59  | 0.71  |
| AGL | MQB  | MACOMB MUNICIPAL                     | MACOMB                | 40309  | 55485  | 0   | 1.36  | 0.64  |
| AGL | GRE  | GREENVILLE                           | GREENVILLE            | 64720  | 26883  | 58  | 0.64  | 0.61  |
| AGL | C80  | WAGON WHEEL                          | ROCKTON               | 66705  | 24610  | 66  | 0.47* | 0.60* |
| AGL | DKB  | DEKALB MUNI                          | DEKALB                | 56776  | 31841  | 0   | 0.62  | 0.59  |
| AGL | C34  | GIBSON CITY MUNI                     | GIBSON CITY           | 71729  | 12824  | 70  | 0.45* | 0.56* |
| AGL | C66  | MONMOUTH MUNICIPAL                   | MONMOUTH              | 28680  | 55193  | 0   | 1.05  | 0.56  |
| AGL | C48  | SANDWICH                             | SANDWICH              | 57079  | 18632  | 0   | 0.58  | 0.50  |
| AGL | C07  | KEWANEE MUNI                         | KEWANEE               | 32111  | 39382  | 0   | 1.09  | 0.48  |
| AGL | PRG  | EDGAR COUNTY                         | PARIS                 | 25501  | 46979  | 0   | 1.06  | 0.44  |
| AGL | CTK  | INGERSOLL                            | CANTON                | 36595  | 29345  | 0   | 1.18  | 0.42  |
| AGL | H07  | HIGHLAND-WINET                       | HIGHLAND              | 44022  | 19160  | 0   | 0.96  | 0.41  |
| AGL | 1H2  | EFFINGHAM COUNTY MEMORIAL            | EFFINGHAM             | 28590  | 33418  | 0   | 0.33  | 0.39  |
| AGL | M30  | METROPOLIS MUNI                      | METROPOLIS            | 18826  | 39917  | 0   | 0.39  | 0.39  |
| AGL | 3LF  | LITCHFIELD MUNI                      | LITCHFIELD            | 30027  | 29065  | 0   | 0.78  | 0.36  |
| AGL | PPQ  | PITTSFIELD PENSTONE MUNICIPAL        | PITTSFIELD            | 19708  | 35671  | 0   | 0.34  | 0.35  |
| AGL | C13  | OTTAWA                               | OTTAWA                | 28087  | 26515  | 0   | 0.39  | 0.34  |
| AGL | 1C8  | COTTONWOOD                           | ROCKFORD              | 25076  | 27450  | 0   | 1.37  | 0.32  |
| AGL | C95  | WOODS FIELD                          | EAST MOLINE           | 38051  | 12420  | 0   | 0.24  | 0.30  |
| AGL | CUL  | CARMI MUNI                           | CARMI                 | 36163  | 11803  | 0   | 0.28  | 0.27  |
| AGL | H96  | BENTON MUNI                          | BENTON                | 29519  | 17622  | 0   | 0.23  | 0.21  |
| AGL | C54  | VALLEY                               | SPRING VALLEY         | 13292  | 31400  | 0   | 0.20  | 0.19  |
| AGL | DTG  | DAUGHT                               | DWIGHT                | 24591  | 16014  | 0   | 0.17  | 0.19  |
| AGL | STQ  | ROME AVIATION                        | STREATOR              | 15015  | 26186  | 0   | 0.20  | 0.18  |
| AGL | K06  | GREATER BEARDSTOWN                   | BEARDSTOWN            | 16450  | 15008  | 0   | 0.22  | 0.17  |
| AGL | 3TV  | TAYLORVILLE MUNI                     | TAYLORVILLE           | 20638  | 10959  | 0   | 0.23  | 0.21  |
| AGL | C82  | BRESSON AIRPORT                      | COMPTON               | 16642  | 13419  | 0   | 0.19  | 0.19  |
| AGL | C41  | PIPER                                | PRINCETON             | 15503  | 13048  | 0   | 0.17  | 0.19  |
| AGL | 79IL | MILFORD                              | MILFORD               | 13337  | 15012  | 0   | 0.20  | 0.18  |
| AGL | 1C2  | NEW LENOX-HOWELL                     | NEW LENOX             | 18015  | 11202  | 0   | 0.22  | 0.17  |
| AGL | 3KK  | KANKAKEE                             | KANKAKEE              | 20537  | 6704   | 0   | 0.19  | 0.18  |
| AGL | C00  | MERCER COUNTY                        | ALEDO                 | 16006  | 9976   | 0   | 0.19  | 0.17  |

|         |                                |                |          |         |       |       |       |       |
|---------|--------------------------------|----------------|----------|---------|-------|-------|-------|-------|
| AGL H84 | FLORA MUNI                     | FLORA          | 6853.    | 16713.  | 1531. | 0.    | 0.26  | 0.16  |
| AGL 0C3 | WILHELMI FIELD                 | JOLIET         | 15458.   | 5046.   | 1207. | 0.    | 0.16  | 0.14  |
| AGL 0C8 | SPONHOLTZ                      | NEWARK         | 13374.   | 4366.   | 837.  | 0.    | 0.14  | 0.12  |
| AGL 102 | MT CARMEL MUNI                 | MT CARMEL      | 11018.   | 6100.   | 848.  | 0.    | 0.13  | 0.11  |
| AGL K96 | TUSCOLA                        | TUSCOLA        | 9806.    | 3201.   | 641.  | 0.    | 0.10  | 0.09  |
| AGL 0C7 | GRANDPAS' FARM MENDOTA         | MENDOTA        | 4097.    | 5336.   | 415.  | 0.    | 0.06  | 0.06  |
| AGL C51 | HAVANA                         | HAVANA         | 4757.    | 1553.   | 356.  | 0.    | 0.05  | 0.04  |
| AGL BDF | RINKENBERGER                   | BRADFORD       | 1089.    | 355.    | 405.  | 0.    | 0.01  | 0.01  |
| AGL VPZ | PORTER COUNTY MUNI             | VALPARAISO     | 1417583. | 297272. | 1531. | 21.39 | 6.41  | 11.39 |
| AGL GYY | GARY MUNI                      | GARY           | 1229950. | 210965. | 1207. | 8.32* | 8.32* | 9.57* |
| AGL EKM | ELKHART MUNI                   | ELKHART        | 798441.  | 239728. | 837.  | 6.05* | 6.05* | 6.90* |
| AGL BAK | COLUMBUS BAKALAR MUNI          | COLUMBUS       | 774227.  | 235313. | 848.  | 3.78  | 3.78  | 6.71  |
| AGL OKK | KOKOMO MUNI                    | KOKOMO         | 618219.  | 208087. | 641.  | 3.26  | 3.26  | 5.49  |
| AGL RID | RICHMOND MUNI                  | RICHMOND       | 614603.  | 132012. | 634.  | 3.44  | 3.44  | 4.96  |
| AGL 418 | INDIANAPOLIS METROPOLITAN      | INDIANAPOLIS   | 483706.  | 186857. | 498.  | 3.25  | 3.25  | 4.46  |
| AGL C65 | PLYMOUTH MUNI                  | PLYMOUTH       | 458425.  | 182150. | 475.  | 2.32  | 2.32  | 4.26  |
| AGL AID | ANDERSON MUNI                  | ANDERSON       | 405621.  | 174114. | 415.  | 3.35* | 3.35* | 3.85* |
| AGL MZZ | MARION MUNI                    | MARION         | 372994.  | 165982. | 356.  | 2.17  | 2.17  | 3.58  |
| AGL 3FK | FRANKLIN                       | FRANKLIN       | 364398.  | 169867. | 356.  | 2.74* | 2.74* | 3.55* |
| AGL GSH | GOSHEN MUNI                    | GOSHEN         | 390617.  | 90464.  | 405.  | 1.69  | 1.69  | 3.20  |
| AGL SMD | SMITH FIELD                    | FORT WAYNE     | 316569.  | 150902. | 303.  | 1.88  | 1.88  | 3.11  |
| AGL 05C | GRIFFITH                       | GRIFFITH       | 326930.  | 100868. | 331.  | 1.84  | 1.84  | 2.84  |
| AGL MGC | MICHIGAN CITY                  | MICHIGAN CITY  | 229687.  | 143404. | 240.  | 1.57  | 1.57  | 2.48  |
| AGL 122 | RANDOLPH COUNTY                | GREENHESTER    | 223887.  | 144530. | 220.  | 1.81* | 1.81* | 2.45* |
| AGL 511 | SKYWAY                         | GREENWOOD      | 222118.  | 144660. | 208.  | 1.80* | 1.80* | 2.44* |
| AGL BFR | VIRGIL I GRISSOM MUNI          | BEDFORD        | 240759.  | 115584. | 245.  | 1.80  | 1.80  | 2.37  |
| AGL ANQ | TRI-STATE STEUBEN COUNTY       | ANGOLA         | 230719.  | 115570. | 224.  | 1.81  | 1.81  | 2.30  |
| AGL UWL | NEW CASTLE-HENRY CO. MUNI.     | NEW CASTLE     | 242307.  | 81943.  | 245.  | 1.22  | 1.22  | 2.15  |
| AGL 03C | HUNTINGTON MUNI                | HUNTINGTON     | 262322.  | 53394.  | 260.  | 1.70* | 1.70* | 2.10* |
| AGL ASH | WARSAM MUNI                    | WARSAM         | 222318.  | 87071.  | 230.  | 1.21  | 1.21  | 2.06  |
| AGL C39 | MICHIGAN CITY MUNI             | MICHIGAN CITY  | 260439.  | 43003.  | 299.  | 1.41* | 1.41* | 2.02  |
| AGL 313 | SKY KING                       | TERRE HAUTE    | 191237.  | 111849. | 164.  | 1.48* | 1.48* | 2.01* |
| AGL 35M | SHELBYVILLE MUNI               | SHELBYVILLE    | 226634.  | 68962.  | 221.  | 1.27  | 1.27  | 1.96  |
| AGL 114 | EAGLE CREEK AIRPARK            | INDIANAPOLIS   | 139210.  | 150801. | 0.    | 5.41  | 5.41  | 1.93  |
| AGL C62 | KENDALLVILLE MUNI              | KENDALLVILLE   | 199732.  | 86388.  | 186.  | 1.41* | 1.41* | 1.90* |
| AGL RCR | FULTON COUNTY                  | ROCHESTER      | 210870.  | 42517.  | 216.  | 1.24  | 1.24  | 1.62  |
| AGL CFJ | CRAWFORDSVILLE MUNI            | CRAWFORDSVILLE | 203264.  | 40363.  | 202.  | 1.15  | 1.15  | 1.62  |
| AGL SER | FREEMAN MUNI                   | SEYMOUR        | 110977.  | 126450. | 99.   | 1.44  | 1.44  | 1.58  |
| AGL IMH | WABASH MUNI                    | WABASH         | 164497.  | 53249.  | 166.  | 1.01  | 1.01  | 1.45  |
| AGL CEV | METTEL FIELD                   | CONNERSVILLE   | 144029.  | 47018.  | 110.  | 1.08  | 1.08  | 1.41  |
| AGL 3AR | ARETZ                          | LAFAYETTE      | 124325.  | 83296.  | 0.    | 1.51  | 1.51  | 1.27  |
| AGL 199 | ALEXANDRIA                     | ALEXANDRIA     | 151153.  | 28926.  | 141.  | 0.75  | 0.75  | 1.20  |
| AGL SIV | SULLIVAN COUNTY                | SULLIVAN       | 127688.  | 49086.  | 124.  | 0.86  | 0.86  | 1.17  |
| AGL 176 | PERU MUNI                      | PERU           | 135711.  | 35217.  | 133.  | 0.69  | 0.69  | 1.14  |
| AGL IMS | MADISON MUNI                   | MADISON        | 112361.  | 57752.  | 89.   | 0.83  | 0.83  | 1.13  |
| AGL 121 | INDIANAPOLIS BROOKSIDE AIRPARK | INDIANAPOLIS   | 129546.  | 37238.  | 98.   | 0.98  | 0.98  | 1.11  |
| AGL 417 | PUTNAM COUNTY                  | GREENCASTLE    | 128856.  | 23501.  | 122.  | 0.80* | 0.80* | 1.01* |
| AGL OEA | ONEAL                          | VINCENNES      | 122759.  | 21351.  | 123.  | 0.80* | 0.80* | 0.96* |
| AGL HNB | HUNTINGBURG                    | HUNTINGBURG    | 77403.   | 56442.  | 56.   | 0.85  | 0.85  | 0.89  |
| AGL MCX | WHITE COUNTY                   | MONTECELLO     | 86807.   | 45102.  | 85.   | 0.59  | 0.59  | 0.88  |
| AGL 138 | HAPS                           | JEFFERSONVILLE | 26990.   | 102668. | 0.    | 0.65  | 0.65  | 0.86  |
| AGL 152 | INDIANAPOLIS TERRY             | INDIANAPOLIS   | 87302.   | 40574.  | 83.   | 0.51  | 0.51  | 0.85  |
| AGL DCY | DAVIESS COUNTY                 | WASHINGTON     | 84874.   | 27708.  | 0.    | 0.89  | 0.89  | 0.75  |
| AGL TEL | PERRY COUNTY MUNI              | TELL CITY      | 58069.   | 48779.  | 0.    | 1.57  | 1.57  | 0.71  |
| AGL 501 | KENTLAND MUNI                  | KENTLAND       | 40366.   | 43214.  | 41.   | 0.53* | 0.53* | 0.69* |
| AGL FRI | FRENCH LICK MUNI               | FRENCH LICK    | 62582.   | 41778.  | 55.   | 0.72  | 0.72  | 0.69  |
| AGL GGP | LOGANSPOUT MUNI                | LOGANSPOUT     | 47403.   | 44931.  | 0.    | 0.58  | 0.58  | 0.61  |
| AGL 35Y | SPEEDWAY                       | INDIANAPOLIS   | 69441.   | 22667.  | 0.    | 0.73  | 0.73  | 0.61  |
| AGL 3HO | HOBART SKY RANCH               | HOBART         | 61440.   | 27508.  | 0.    | 0.67  | 0.67  | 0.59  |

|     |      |                          |                        |    |         |         |      |       |       |
|-----|------|--------------------------|------------------------|----|---------|---------|------|-------|-------|
| AGL | IO1  | 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 | 514  | 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  | MAWASEE                  | SYRACUSE               | IN | 28194.  | 35976.  | 0.   | 0.38  | 0.43  |
| AGL | 012  | 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 | 712  | REESE                    | MUNCIE                 | IN | 28311.  | 13182.  | 0.   | 0.32  | 0.28  |
| AGL | 715  | 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 | 614  | BOONE COUNTY             | LEBANON                | IN | 22527.  | 7353.   | 0.   | 0.23  | 0.20  |
| AGL | 311  | ELWOOD                   | ELWOOD                 | IN | 19440.  | 10363.  | 0.   | 0.21  | 0.20  |
| AGL | RZL  | JASPER COUNTY            | RENSSELAER             | IN | 21149.  | 6904.   | 0.   | 0.27  | 0.19  |
| AGL | PLD  | STEED FLD                | PORTLAND               | IN | 8871.   | 17746.  | 22.  | 0.15* | 0.18* |
| AGL | 4C4  | ARENS FIELD              | WINAMAC                | IN | 23468.  | 4237.   | 0.   | 0.21  | 0.17  |
| AGL | 613  | RUZICKA                  | KOKOMO                 | IN | 19700.  | 6430.   | 0.   | 0.20  | 0.17  |
| AGL | 711  | KELLYS AIRFIELD          | MOORESVILLE            | IN | 18908.  | 6173.   | 0.   | 0.16  | 0.13  |
| AGL | C92  | MENTONE                  | MENTONE                | IN | 15150.  | 4945.   | 0.   | 0.14  | 0.12  |
| 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 | I13  | 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 | 671  | D AND R AIRPARK          | RUSHVILLE              | IN | 4082.   | 1333.   | 0.   | 0.04  | 0.04  |
| AGL | I17  | CLINTON                  | CLINTON                | IN | 2951.   | 963.    | 0.   | 0.03  | 0.03  |
| AGL | I11  | 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 | ID2  | 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  | 3.50  |
| AGL | 5D3  | OMOSSO CITY              | OLJOSO                 | 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  | MEMORINEE-MARINETTE      | MEMORINEE              | MI | 323328. | 159026. | 341. | 2.28  | 3.20  |
| AGL | 3CM  | JAMES CLEMENTS MUNI      | BAY CITY               | MI | 333253. | 155491. | 323. | 2.34* | 3.11* |
| AGL | ESC  | DELTA COUNTY             | ESCANABA               | MI | 305723. | 132134. | 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                  | MI | 292834. | 107147. | 297. | 2.16* | 2.66* |
| AGL | C91  | CASS COUNTY NEHL                 | MI | 312685. | 77871.  | 314. | 2.13* | 2.59* |
| AGL | 5G9  | WAGON WHEEL                      | MI | 301285. | 53913.  | 291. | 1.88* | 2.36* |
| AGL | 0G9  | SALEM                            | MI | 300059. | 54205.  | 290. | 1.87* | 2.35* |
| AGL | ACB  | EMMET COUNTY                     | MI | 209495. | 137511. | 239. | 1.29  | 2.31  |
| AGL | AMN  | ANTRIM COUNTY                    | MI | 199069. | 139642. | 201. | 1.78  | 2.25  |
| AGL | 5D8  | BROOKS FIELD                     | MI | 208774. | 129709. | 213. | 1.39  | 2.25  |
| AGL | D95  | DUPONT-LAPEER                    | MI | 262673. | 53175.  | 279. | 1.14  | 2.10  |
| AGL | Y15  | CHEBOYGAN CITY-COUNTY            | MI | 256557. | 57312.  | 251. | 1.65* | 2.09* |
| AGL | 8D4  | SPARTA                           | MI | 179043. | 134572. | 209. | 1.34  | 2.08  |
| AGL | IND  | GOGEBIC COUNTY                   | MI | 168961. | 134965. | 167. | 1.53* | 2.02* |
| AGL | UIZ  | BERZ-MACOMB                      | MI | 163351. | 133637. | 158. | 1.61  | 1.98  |
| AGL | MQT  | MARQUETTE COUNTY                 | MI | 227681. | 59436.  | 227. | 1.46  | 1.91  |
| AGL | MOP  | MT PLEASANT MUNICIPAL            | MI | 124798. | 146095. | 0.   | 1.81  | 1.80  |
| AGL | MBL  | MANISTEE CO.-BLACKER             | MI | 224782. | 43206.  | 229. | 1.14  | 1.78  |
| AGL | 3GM  | GRAND HAVEN MEML AIRPARK         | MI | 208865. | 55971.  | 228. | 0.98  | 1.76  |
| AGL | 09G  | MASON JEWETT FIELD               | MI | 197759. | 54367.  | 191. | 1.30* | 1.68* |
| AGL | CVX  | CHARLEVOIX MUNI                  | MI | 206337. | 36437.  | 203. | 1.31* | 1.61* |
| AGL | 07G  | FITCH H BEACH                    | MI | 130905. | 102315. | 135. | 0.91  | 1.55  |
| AGL | 35D  | PADGHAM FIELD                    | MI | 177769. | 52798.  | 189. | 0.83  | 1.53  |
| AGL | 3TE  | AL MEYERS                        | MI | 178379. | 42722.  | 194. | 0.67  | 1.47  |
| AGL | CAD  | MEXFORD COUNTY                   | MI | 169613. | 32857.  | 164. | 1.07* | 1.35* |
| AGL | CIU  | CHIPPEWA COUNTY                  | MI | 116091. | 52851.  | 116. | 0.66  | 1.12  |
| AGL | 6D9  | IOSCO COUNTY                     | MI | 137434. | 24263.  | 135. | 0.87* | 1.07* |
| AGL | Y85  | HILLSDALE MUNI                   | MI | 134496. | 24742.  | 132. | 0.85* | 1.06* |
| AGL | 3BB  | BIG BEAVER                       | MI | 113638. | 37094.  | 0.   | 1.19  | 1.00  |
| AGL | 6D6  | GREENVILLE MUNI                  | MI | 36416.  | 113912. | 0.   | 0.82  | 1.00  |
| AGL | D13  | MCKINLEY                         | MI | 90044.  | 47925.  | 0.   | 1.01  | 0.92  |
| AGL | 77D  | ROBEN-HOOD                       | MI | 95737.  | 35848.  | 94.  | 0.67* | 0.87* |
| AGL | 3FM  | FREMONT MUNI                     | MI | 103962. | 23008.  | 109. | 0.46  | 0.84  |
| AGL | D96  | BRANCH COUNTY MEMORIAL           | MI | 75086.  | 41686.  | 49.  | 0.59  | 0.78  |
| AGL | ISQ  | SCHOOLCRAFT COUNTY               | MI | 93371.  | 20174.  | 98.  | 0.39  | 0.75  |
| AGL | SJX  | BEAVER ISLAND                    | MI | 5649.   | 107207. | 0.   | 0.56  | 0.75  |
| AGL | IRS  | KIRSCH MUNI                      | MI | 34915.  | 68318.  | 0.   | 1.34  | 0.69  |
| AGL | Y93  | ATLANTA MUNI                     | MI | 4540.   | 85759.  | 0.   | 0.36  | 0.60  |
| AGL | 3BS  | JACK BARSTOW                     | MI | 67862.  | 22124.  | 1.   | 2.15  | 0.60  |
| AGL | 83D  | MACKINAC COUNTY                  | MI | 10690.  | 74537.  | 0.   | 0.37  | 0.57  |
| AGL | ERY  | LUCE COUNTY HALE                 | MI | 59265.  | 16402.  | 50.  | 0.34  | 0.50  |
| AGL | 78D  | CARO MUNI                        | MI | 58975.  | 10416.  | 58.  | 0.37* | 0.46* |
| AGL | IMI6 | ROSEDALE                         | MI | 9591.   | 63329.  | 0.   | 0.28  | 0.42  |
| AGL | D87  | HARBOR SPRINGS                   | MI | 43624.  | 50568.  | 0.   | 0.28  | 0.40  |
| AGL | 3SG  | HARRY W. BRONNE                  | MI | 40684.  | 14241.  | 0.   | 1.06  | 0.38  |
| AGL | 57D  | MACOMB                           | MI | 34168.  | 14594.  | 0.   | 0.42  | 0.37  |
| AGL | 76G  | MARINE CITY                      | MI | 39838.  | 18242.  | 0.   | 0.38  | 0.35  |
| AGL | 43G  | LARSEN AIR PARK                  | MI | 36186.  | 13020.  | 0.   | 0.41  | 0.35  |
| AGL | GDW  | GLADWIN                          | MI | 36883.  | 12039.  | 0.   | 0.39  | 0.34  |
| AGL | 3NP  | BELFORD MAULE FIELD              | MI | 35704.  | 13225.  | 0.   | 0.37  | 0.33  |
| AGL | 1G4  | SPENCER FIELD                    | MI | 31394.  | 16034.  | 0.   | 0.35  | 0.32  |
| AGL | 76D  | HURON COUNTY MEMORIAL            | MI | 29355.  | 19042.  | 0.   | 0.98  | 0.32  |
| AGL | HAI  | THREE RIVERS MUNICIPAL DR HAINES | MI | 35031.  | 11435.  | 0.   | 0.37  | 0.31  |
| AGL | C05  | SOUTH KENT                       | MI | 34187.  | 11159.  | 0.   | 0.36  | 0.30  |
| AGL | 61D  | OTSEGO-PLAINWELL MUNI            | MI | 28477.  | 14171.  | 0.   | 0.87  | 0.28  |
| AGL | LDM  | MASON COUNTY                     | MI | 29744.  | 9709.   | 0.   | 0.30  | 0.26  |
| AGL | 99G  | CARLS                            | MI | 27724.  | 9049.   | 0.   | 0.28  | 0.24  |
| AGL | 2D8  | DAVIS                            | MI | 18858.  | 17926.  | 0.   | 0.25  | 0.24  |
| AGL | C28  | NEWAYGO                          | MI | 24434.  | 11566.  | 0.   | 0.27  | 0.24  |
| AGL | I3C  | LAKEVIEW                         | MI | 23051.  | 10147.  | 0.   | 0.24  | 0.22  |
| AGL | 37G  | ALMONT                           | MI | 27392.  | 4812.   | 27.  | 0.17* | 0.21* |
| AGL | BFA  | BOYNE MOUNTAIN                   | MI |         |         |      |       |       |

|     |     |                                          |                     |          |         |       |        |        |
|-----|-----|------------------------------------------|---------------------|----------|---------|-------|--------|--------|
| AGL | Y31 | WEST BRANCH COMMUNITY                    | WEST BRANCH         | 23557.   | 7689.   | 0.    | 0.79   | 0.21   |
| AGL | 7Y0 | TIMBERS SKY CAMP                         | SOUTH BRANCH        | 8327.    | 23633.  | 0.    | 0.16   | 0.21   |
| AGL | D15 | LAKE ISABELLA LANDING AREA               | WEIDMAN             | 8236.    | 20997.  | 0.    | 0.15   | 0.19   |
| AGL | 42C | WHITE CLOUD                              | WHITE CLOUD         | 18244.   | 8458.   | 0.    | 0.20   | 0.18   |
| AGL | OGM | ONTONAGON COUNTY                         | ONTONAGON           | 21845.   | 3910.   | 21.   | 0.14*  | 0.17*  |
| AGL | 39C | OSELKA                                   | THREE OAKS          | 19033.   | 6213.   | 0.    | 0.19   | 0.17   |
| AGL | 5D7 | MILAN                                    | MILAN               | 18493.   | 6036.   | 0.    | 0.19   | 0.16   |
| AGL | Y83 | SANDUSKY CITY                            | SANDUSKY            | 15753.   | 7645.   | 0.    | 0.17   | 0.16   |
| AGL | Y94 | EAST JORDAN CITY                         | EAST JORDAN         | 13090.   | 9502.   | 0.    | 0.15   | 0.15   |
| AGL | 44G | BETZ                                     | BLISSFIELD          | 16651.   | 5435.   | 0.    | 0.17   | 0.15   |
| AGL | 40C | WATERVLIET MUNI                          | WATERVLIET          | 15303.   | 5779.   | 0.    | 0.16   | 0.15   |
| AGL | 48D | CLARE MUNI                               | CLARE               | 12582.   | 6610.   | 0.    | 0.14   | 0.13   |
| AGL | Y91 | HOME ACRES SKY RANCH                     | LAKE CITY           | 12902.   | 6303.   | 0.    | 0.14   | 0.13   |
| AGL | Y17 | ACME SKYPORT                             | ACME                | 13306.   | 4633.   | 0.    | 0.14   | 0.12   |
| AGL | 41C | WAYLAND MUNI                             | WAYLAND             | 13657.   | 4461.   | 0.    | 0.14   | 0.12   |
| AGL | 65G | MAPLE GROVE                              | FOJLERVILLE         | 14104.   | 4604.   | 0.    | 0.14   | 0.12   |
| AGL | Y66 | DRUMMOND ISLAND                          | DRUMMOND ISLAND     | 8469.    | 7640.   | 0.    | 0.11   | 0.11   |
| AGL | C01 | PILOT COUNTRY                            | COOPERSVILLE        | 12865.   | 4199.   | 0.    | 0.13   | 0.11   |
| AGL | 45G | HYNE FIELD                               | BRIGHTON            | 12795.   | 4178.   | 0.    | 0.13   | 0.11   |
| AGL | 55G | ARNOLD FIELD                             | CROSWELL            | 11897.   | 3883.   | 0.    | 0.12   | 0.10   |
| AGL | 88G | GRADOLPH FLD                             | PETERSBURG          | 11897.   | 3883.   | 0.    | 0.12   | 0.10   |
| AGL | HLM | PARK TOWNSHIP                            | HOLLAND             | 21.      | 13503.  | 0.    | 0.05*  | 0.09*  |
| AGL | 3D4 | CITY-COUNTY                              | FRANKFORT           | 3569.    | 7438.   | 0.    | 0.06   | 0.07   |
| AGL | 24C | LOWELL CITY                              | LOWELL              | 8327.    | 2718.   | 0.    | 0.08   | 0.07   |
| AGL | 98G | SEBEWAING                                | SEBEWAING           | 6335.    | 2231.   | 0.    | 0.07   | 0.06   |
| AGL | RCT | MILLER FIELD                             | REED CITY           | 6476.    | 2113.   | 0.    | 0.07   | 0.06   |
| AGL | 3RC | ROSCOMMON CONSERVATION                   | ROSCOMMON           | 6766.    | 2209.   | 0.    | 0.07   | 0.06   |
| AGL | 80D | CLARE COUNTY                             | HARRISON            | 5739.    | 1873.   | 0.    | 0.06   | 0.05   |
| AGL | 09C | AUSTIN LAKE                              | KALAMAZOO           | 3749.    | 1224.   | 0.    | 0.04   | 0.03   |
| AGL | D18 | DOWNWIND ACRES                           | WILLIS              | 2593.    | 848.    | 0.    | 0.03   | 0.02   |
| AGL | ANE | ANOKA COUNTY-BLAINE ARPT(JANES FIELD)    | MINNEAPOLIS         | 1685813. | 402190. | 1767. | 11.78* | 13.87* |
| AGL | 21D | LAKE ELMO                                | ST PAUL             | 1476545. | 307368. | 1414. | 9.32*  | 11.85* |
| AGL | D97 | SOUTH ST PAUL MUNI-RICHARD E FLEMING FLD | SOUTH ST PAUL       | 987086.  | 184762. | 945.  | 6.15*  | 7.79*  |
| AGL | INL | FALLS INTL                               | INTERNATIONAL FALLS | 863829.  | 237896. | 918.  | 3.63   | 7.32   |
| AGL | HIB | CHISHOLM-HIBBING                         | HIBBING             | 707556.  | 215566. | 834.  | 3.47   | 6.13   |
| AGL | GPZ | GRAND RAPIDS ITASCA COUNTY               | GRAND RAPIDS        | 670368.  | 213486. | 678.  | 3.41   | 5.87   |
| AGL | MKT | MANKATO MUNI                             | MANKATO             | 586035.  | 201835. | 612.  | 3.32   | 5.23   |
| AGL | BRD | BRAINERD-CROW WING CO/WALTER WIELAND FLD | BRAINERD            | 498261.  | 184650. | 537.  | 2.56   | 4.54   |
| AGL | AXN | CHANDLER FIELD                           | ALEXANDRIA          | 385646.  | 159209. | 346.  | 2.90   | 3.62   |
| AGL | OWA | OWATONNA MUNI                            | OWATONNA            | 373983.  | 166052. | 374.  | 2.61   | 3.59   |
| AGL | PKD | PARK RAPIDS MUNI                         | PARK RAPIDS         | 337899.  | 153153. | 449.  | 1.61   | 3.26   |
| AGL | FRM | FAIRMONT MUNI                            | FAIRMONT            | 311565.  | 156794. | 317.  | 1.96   | 3.11   |
| AGL | TVF | THIEF RIVER FALLS REGIONAL               | THIEF RIVER FALLS   | 302662.  | 148123. | 318.  | 2.01   | 3.00   |
| AGL | MML | MARSHALL MUNI-RYAN FIELD                 | MARSHALL            | 291604.  | 153489. | 331.  | 1.99   | 2.96   |
| AGL | ILL | WILLMAR MUNI                             | WILLMAR             | 304939.  | 102477. | 296.  | 1.76   | 2.71   |
| AGL | EVM | EVELETH-VIRGINIA MUNI                    | EVELETH             | 308691.  | 76146.  | 312.  | 1.40   | 2.56   |
| AGL | BDE | BAUDETTIE INTL                           | BAUDETTIE           | 273305.  | 84895.  | 262.  | 2.40   | 2.38   |
| AGL | BJI | BEMIDJI MUNI                             | BEMIDJI             | 202343.  | 139028. | 186.  | 1.37   | 2.27   |
| AGL | AEL | ALBERT LEA MUNI                          | ALBERT LEA          | 191553.  | 109156. | 166.  | 1.29   | 2.00   |
| AGL | COQ | CLOQUET CARLTON COUNTY                   | CLOQUET             | 234487.  | 49715.  | 240.  | 1.06   | 1.89   |
| AGL | OTG | WORTHINGTON MUNI                         | WORTHINGTON         | 168845.  | 104248. | 159.  | 1.26   | 1.81   |
| AGL | AUM | AUSTIN MUNI                              | AUSTIN              | 227488.  | 42124.  | 218.  | 1.30   | 1.79   |
| AGL | ELO | ELY MUNI                                 | ELY                 | 168027.  | 98171.  | 165.  | 1.08   | 1.77   |
| AGL | ULM | NEW ULM MUNI                             | NEW ULM             | 132102.  | 127183. | 134.  | 1.18   | 1.72*  |
| AGL | Y12 | AIRLAKE INDUSTRIAL PARK                  | LAKEVILLE           | 199689.  | 59371.  | 194.  | 1.38*  | 1.72*  |
| AGL | ROX | ROSEAU MUNI                              | ROSEAU              | 135522.  | 83826.  | 128.  | 0.94   | 1.46   |
| AGL | BBB | BENSON MUNI                              | BENSON              | 139765.  | 76965.  | 117.  | 1.28   | 1.44   |
| AGL | LXL | LITTLE FALLS-MORRISON COUNTY             | LITTLE FALLS        | 159452.  | 45008.  | 191.  | 1.30   | 1.36   |
| AGL | MLM | WINDOM MUNI                              | WINDOM              | 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 | MONTVIDEO-CHIPPEWA COUNTY             | MONTVIDEO         | MN | 141848. | 24601.  | 137. | 0.97  | 1.11  |
| AGL | Y25 | GATEWAY NORTH INDUSTRIAL              | ANOKA             | MN | 116423. | 24699.  | 81.  | 0.74* | 0.96* |
| 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 | MJL | 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.  | 5805.   | 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 | FLYNN'S 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 | 20728.  | 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 | 19407.  | 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 | FOSSSTON MUNI                         | FOSSSTON          | 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             | 7914.    | 2583.   | 0.    | 0.08  | 0.07  |
| AGL | 62Y  | TWO HARBORS MUNICIPAL             | TWO HARBORS      | 6334.    | 2067.   | 0.    | 0.06  | 0.06  |
| AGL | 58Y  | SILVER BAY MUNI                   | SILVER BAY       | 5256.    | 1716.   | 0.    | 0.05  | 0.05  |
| AGL | 70Y  | WHEATON MUNI                      | WHEATON          | 4339.    | 1416.   | 0.    | 0.04  | 0.04  |
| AGL | 6D1  | BROOKEN MUNI                      | BROOKEN          | 4552.    | 1486.   | 0.    | 0.05  | 0.04  |
| AGL | 06Y  | HERMAN MUNI                       | HERMAN           | 2567.    | 871.    | 0.    | 0.03  | 0.02  |
| AGL | 6MNS | MAHNMEN COUNTY                    | MAHNMEN          | 2590.    | 845.    | 0.    | 0.03  | 0.02  |
| AGL | JMS  | JAMESTOWN MUNI                    | JAMESTOWN        | 509805.  | 186818. | 525.  | 3.41  | 6.63  |
| AGL | DVL  | DEVILS LAKE MUNI                  | DEVILS LAKE      | 384053.  | 145141. | 457.  | 3.17  | 3.52  |
| AGL | DIK  | DICKINSON MUNICIPAL               | DICKINSON        | 139674.  | 92378.  | 144.  | 1.24  | 1.54  |
| AGL | D04  | BOWMAN MUNICIPAL                  | BOWMAN           | 50891.   | 111271. | 0.    | 0.38  | 1.08  |
| AGL | RUG  | RUGBY MUNI                        | RUGBY            | 47066.   | 14769.  | 37.   | 0.43  | 0.41  |
| AGL | Y19  | MANDAN MUNI                       | MANDAN           | 23697.   | 20795.  | 0.    | 0.29  | 0.30  |
| AGL | GAF  | GRAFTON MUNI                      | GRAFTON          | 22107.   | 20923.  | 0.    | 0.27  | 0.29  |
| AGL | 6D8  | BARNES COUNTY MUNICIPAL           | VALLEY CITY      | 25935.   | 13588.  | 0.    | 0.28  | 0.26  |
| AGL | HEI  | HETTINGER MUNICIPAL               | HETTINGER        | 16180.   | 12239.  | 0.    | 0.20  | 0.22  |
| AGL | D63  | BRECKENRIDGE-WAHPETON INTERSTATE  | WAPPETON         | 18242.   | 11077.  | 0.    | 0.21  | 0.19  |
| AGL | D60  | TIOGA MUNI                        | TIOGA            | 16367.   | 10466.  | 0.    | 0.19  | 0.18  |
| AGL | D09  | BOTTINEAU MUNI                    | BOTTINEAU        | 8969.    | 15927.  | 0.    | 0.14  | 0.17  |
| AGL | D55  | LANGDON MUNI                      | LANGDON          | 15877.   | 10305.  | 0.    | 0.18  | 0.17  |
| AGL | D6D  | ROLLA MUNI                        | ROLLA            | 8969.    | 13359.  | 0.    | 0.13  | 0.15  |
| AGL | ND34 | LISBON MUNI                       | LISBON           | 17452.   | 5697.   | 0.    | 0.18  | 0.15  |
| AGL | 3ND0 | VINCE                             | NORTHWOOD        | 16180.   | 5281.   | 0.    | 0.16  | 0.14  |
| AGL | ND31 | LARIMORE MUNI                     | LARIMORE         | 16180.   | 5281.   | 0.    | 0.16  | 0.14  |
| AGL | IND3 | HARMY FIELD                       | KINDRED          | 14577.   | 4758.   | 0.    | 0.15  | 0.13  |
| AGL | 08D  | STANLEY MUNI                      | STANLEY          | 8969.    | 10739.  | 0.    | 0.12  | 0.13  |
| AGL | Y36  | MOHALL MUNI                       | MOHALL           | 14300.   | 4668.   | 0.    | 0.15  | 0.13  |
| AGL | PMB  | PEMBINA MUNI                      | PEMBINA          | 10546.   | 8565.   | 0.    | 0.13  | 0.13  |
| AGL | ND44 | MOTT MUNICIPAL                    | MOTT             | 14300.   | 4668.   | 0.    | 0.15  | 0.13  |
| AGL | S32  | COOPERSTOWN MUNI                  | COOPERSTOWN      | 13214.   | 4313.   | 0.    | 0.14  | 0.12  |
| AGL | D50  | CROSBY MUNI                       | CROSBY           | 13214.   | 4313.   | 0.    | 0.14  | 0.12  |
| AGL | 05D  | NEW TOWN MUNI                     | NEW TOWN         | 5815.    | 12329.  | 0.    | 0.10  | 0.12  |
| AGL | ND59 | ST THOMAS MUNI                    | ST THOMAS        | 12251.   | 4000.   | 0.    | 0.12  | 0.11  |
| AGL | 96D  | WALHALLA MUNI                     | WALHALLA         | 12120.   | 3957.   | 0.    | 0.12  | 0.11  |
| AGL | D57  | GLEN ULLIN MUNI                   | GLEN ULLIN       | 11146.   | 3638.   | 0.    | 0.11  | 0.10  |
| AGL | ND06 | CAVALIER MUNI                     | CAVALIER         | 9756.    | 3185.   | 0.    | 0.10  | 0.09  |
| AGL | S25  | WATFORD CITY MUNI                 | WATFORD CITY     | 10059.   | 3283.   | 0.    | 0.10  | 0.09  |
| AGL | D56  | MAYVILLE MUNI                     | MAYVILLE         | 9133.    | 2982.   | 0.    | 0.09  | 0.08  |
| AGL | Y37  | PARK RIVER MUNI                   | PARK RIVER       | 8607.    | 2810.   | 0.    | 0.09  | 0.08  |
| AGL | Y74  | HANKINS FIELD                     | PARSHALL         | 7926.    | 2587.   | 0.    | 0.08  | 0.07  |
| AGL | S28  | INTERNATIONAL PEACE GARDEN        | DUNSEITH         | 7994.    | 2609.   | 0.    | 0.08  | 0.07  |
| AGL | ND12 | ELLENDALE MUNI                    | ELLENDALE        | 6871.    | 2243.   | 0.    | 0.07  | 0.06  |
| AGL | ND49 | OAKES MUNICIPAL                   | OAKES            | 5927.    | 1935.   | 0.    | 0.06  | 0.05  |
| AGL | ASY  | ASHLEY MUNI                       | ASHLEY           | 5814.    | 1898.   | 0.    | 0.06  | 0.05  |
| AGL | 20U  | BEACH                             | BEACH            | 4555.    | 1487.   | 0.    | 0.05  | 0.04  |
| AGL | D64  | WESTHOPE MUNI                     | WESTHOPE         | 4238.    | 1383.   | 0.    | 0.04  | 0.04  |
| AGL | 90Y  | LEONARD MUNICIPAL                 | LEONARD          | 1778.    | 580.    | 0.    | 0.02  | 0.02  |
| AGL | 22G  | LORAIN COUNTY REGIONAL            | LORAIN/ELYRIA/   | 1847813. | 416113. | 1898. | 10.60 | 15.04 |
| AGL | MGY  | DAYTON GENERAL ARPT SOUTH         | DAYTON           | 1533983. | 353604. | 1633. | 7.54  | 12.54 |
| AGL | HA0  | HAMILTON AIRPORT                  | HAMILTON         | 914329.  | 263137. | 909.  | 6.23* | 7.82* |
| AGL | 214  | BOLTON FLD                        | COLUMBUS         | 831125.  | 247558. | 927.  | 5.44* | 7.17* |
| AGL | LNN  | LOST NATION                       | WILLOUGHBY       | 741814.  | 183543. | 721.  | 4.88* | 6.15* |
| AGL | MW0  | HOOK FIELD MUNI                   | MIDDLETOWN       | 700924.  | 219733. | 738.  | 4.31  | 6.02  |
| AGL | MNN  | MARION MUNI                       | MARION           | 696627.  | 209299. | 727.  | 3.88  | 6.12  |
| AGL | SG7  | BLUFFTON                          | BLUFFTON         | 657383.  | 152361. | 632.  | 3.38  | 5.38  |
| AGL | 1G3  | ANDREW W PATON OF KENT STATE UNIV | KENT             | 570555.  | 204952. | 489.  | 3.95* | 5.15* |
| AGL | A0H  | ALLEN COUNTY                      | LIMA             | 567656.  | 203933. | 562.  | 3.14  | 5.13  |
| AGL | PHD  | HARRY CLEVER FIELD                | NEW PHILADELPHIA | 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 | Q2G  | COLUMBIANA COUNTY            | EAST LIVERPOOL         | OH | 430110 | 113303 | 414 | 2.02  | 3.61  |
| AGL | GQO  | 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 | I6G  | 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 | I7G  | PORT BUCYRUS-CRAWFORD COUNTY | BUCYRUS                | OH | 220987 | 90048  | 210 | 1.54* | 2.07* |
| AGL | SKY  | GRIFFING SANDUSKY            | SANDUSKY               | OH | 147984 | 160344 | 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 | I50  | 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 | I5G  | WELTZIEN SKYPARK             | WADSWORTH              | OH | 141922 | 61374  | 0   | 1.53  | 1.35  |
| AGL | I60  | 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 REGIONAL        | 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              | COSHOCOTON             | 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. MUNI          | TREMONT CITY           | OH | 33090  | 116166 | 0   | 0.84  | 0.99  |
| AGL | 7I7  | BELLEFONTAINE                | 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 | CY0  | 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 | 90589  | 22088  | 84  | 0.68  | 0.75  |

|     |       |                              |                        |        |        |      |       |       |
|-----|-------|------------------------------|------------------------|--------|--------|------|-------|-------|
| AGL | BJJ   | WAYNE COUNTY                 | WOOSTER                | 66365. | 45187. | 43.  | 0.60* | 0.74* |
| AGL | 3DS   | BORDNER AIRSTRIP             | BOWLING GREEN          | 65749. | 44860. | 0.   | 0.73  | 0.73  |
| AGL | 1G1   | ELYRIA                       | ELYRIA                 | 84869. | 24910. | 83.  | 0.57* | 0.73* |
| AGL | 173   | MORaine AIR PARK             | DAYTON                 | 80064. | 26135. | 0.   | 0.83  | 0.71  |
| AGL | OH30  | PUT IN BAY                   | PUT IN BAY             | 9979.  | 91169. | 0.   | 0.43  | 0.67  |
| AGL | 319   | BUCKEYE VALLEY               | HEBRON                 | 63051. | 27629. | 62.  | 0.47* | 0.64* |
| AGL | OH21  | HURON COUNTY-CITY OF NORWALK | NORWALK                | 15362. | 80414. | 0.   | 0.43  | 0.64  |
| AGL | 62D   | WARREN                       | WARREN                 | 53335. | 38229. | 35.  | 0.47* | 0.61* |
| AGL | 1G6   | STRONGSVILLE                 | STRONGSVILLE           | 67482. | 22028. | 0.   | 0.70  | 0.59  |
| AGL | 10G   | HOLMES COUNTY                | MILLERSBURG            | 60667. | 21489. | 55.  | 0.39  | 0.55  |
| AGL | 4G4   | YOUNGSTOWN ELSEER METRO      | NORTH LIMA             | 66390. | 12201. | 62.  | 0.41* | 0.52* |
| AGL | 371   | TROY SKYPARK                 | TROY                   | 65978. | 12995. | 64.  | 0.41* | 0.52* |
| AGL | 12G   | SHELBY COMMUNITY             | SHELBY                 | 60728. | 15765. | 58.  | 0.39* | 0.51* |
| AGL | PVZ   | CASEMENT                     | PAINESVILLE            | 58787. | 10405. | 57.  | 0.37* | 0.46* |
| AGL | 144   | DAHIO                        | DAYTON                 | 28293. | 36181. | 0.   | 0.38  | 0.43  |
| AGL | OH14  | WOODRUFF                     | MONTPELIER             | 41691. | 18578. | 0.   | 0.45  | 0.40  |
| AGL | CDI   | CAMBRIDGE MUNI               | CAMBRIDGE              | 14795. | 45061. | 0.   | 0.55  | 0.40  |
| AGL | 310   | RIVERSIDE                    | ZANESVILLE             | 44403. | 14495. | 0.   | 0.44  | 0.39  |
| AGL | 7D5   | PRIEBE                       | FINDLAY                | 18497. | 38371. | 0.   | 0.30  | 0.38  |
| AGL | I62   | BROOKVILLE AIR-PARK          | BROOKVILLE             | 39531. | 18295. | 0.   | 0.42  | 0.38  |
| AGL | FZ1   | FOSTORIA METROPOLITAN        | FOSTORIA               | 26983. | 26724. | 85.  | 0.61  | 0.36  |
| AGL | AMT   | ALEXANDER SALAMON            | WEST UNION             | 18469. | 35182. | 0.   | 0.31  | 0.36  |
| AGL | RZT   | ROSS COUNTY                  | CHILLICOTHE            | 27504. | 23470. | 0.   | 0.34  | 0.34  |
| AGL | 8G6   | HARRISON COUNTY              | CADIZ                  | 24968. | 24187. | 78.  | 0.46  | 0.33  |
| AGL | I10   | NOBLE COUNTY AIRPARK         | CALDWELL               | 17058. | 31706. | 0.   | 0.27  | 0.32  |
| AGL | VES   | DARKE COUNTY                 | VERSAILLES             | 37270. | 11093. | 130. | 0.69  | 0.32  |
| AGL | 3G3   | WADSWORTH MUNI               | WADSWORTH              | 31106. | 15451. | 0.   | 0.34  | 0.31  |
| AGL | I74   | GRIMES FIELD                 | URBANA                 | 31398. | 12786. | 0.   | 0.33  | 0.29  |
| AGL | GEO   | BROWN COUNTY                 | GEORGETOWN             | 10231. | 31581. | 0.   | 0.23  | 0.28  |
| AGL | OWX   | PUTNAM COUNTY                | OTTAWA                 | 25963. | 15215. | 0.   | 0.28  | 0.27  |
| AGL | 4G8   | COLUMBIA                     | COLUMBIA STATION       | 27818. | 9081.  | 0.   | 0.20  | 0.25  |
| AGL | OH23  | BLATTER                      | ORRVILLE               | 12354. | 24148. | 0.   | 0.20  | 0.24  |
| AGL | I43   | JAMES A RHODES               | JACKSON                | 15116. | 19680. | 45.  | 0.35  | 0.23  |
| AGL | HTW   | LAWRENCE COUNTY AIRPARK      | CHEESAPEAKE/HUNTINGTON | 16133. | 17942. | 0.   | 0.21  | 0.23  |
| AGL | 4D6   | CHARDON                      | CHARDON                | 24779. | 8089.  | 0.   | 0.25  | 0.22  |
| AGL | 2D7   | BEACH CITY                   | BEACH CITY             | 25152. | 8212.  | 0.   | 0.25  | 0.22  |
| AGL | 5D4   | MARTIN FIELD                 | CANTON                 | 14109. | 15383. | 0.   | 0.18  | 0.20  |
| AGL | 041   | COLUMBUS SOUTHWEST           | COLUMBUS               | 22919. | 7482.  | 0.   | 0.23  | 0.20  |
| AGL | OH20  | NORTHFIELD                   | NORTHFIELD             | 22324. | 7288.  | 0.   | 0.22  | 0.20  |
| AGL | 221   | VINTON COUNTY                | MCARTHUR               | 10874. | 16212. | 0.   | 0.16  | 0.18  |
| AGL | 091   | DELPHOS                      | DELPHOS                | 19094. | 6234.  | 0.   | 0.19  | 0.17  |
| AGL | 191   | BROWNIES LEBANON             | LEBANON                | 9163.  | 14203. | 0.   | 0.13  | 0.16  |
| AGL | 1G8   | DYER                         | TORONTO                | 18335. | 5983.  | 0.   | 0.18  | 0.16  |
| AGL | I66   | CLINTON FIELD                | WILMINGTON             | 9201.  | 13065. | 0.   | 0.13  | 0.15  |
| AGL | I71   | MORGAN COUNTY                | MCCONNELLSVILLE        | 5381.  | 16708. | 0.   | 0.11  | 0.15  |
| AGL | 421   | PARR                         | ZANESVILLE             | 13001. | 9419.  | 0.   | 0.15  | 0.15  |
| AGL | I57   | PIKE COUNTY                  | WAVERLY                | 8491.  | 12859. | 0.   | 0.12  | 0.14  |
| AGL | I95   | HARDIN COUNTY                | KENTON                 | 15612. | 5096.  | 0.   | 0.16  | 0.14  |
| AGL | OH103 | ALDERMAN                     | ST CLAIRSVILLE         | 15113. | 4933.  | 0.   | 0.15  | 0.13  |
| AGL | 88D   | HURON                        | HURON                  | 9203.  | 8393.  | 0.   | 0.11  | 0.12  |
| AGL | 401   | WAYNESVILLE                  | WAYNESVILLE            | 13004. | 4245.  | 0.   | 0.13  | 0.11  |
| AGL | 67D   | BOTSFORD                     | WELLINGTON             | 11945. | 4439.  | 0.   | 0.12  | 0.11  |
| AGL | 4G5   | MONROE COUNTY                | WOODSFIELD             | 6789.  | 8250.  | 0.   | 0.09  | 0.10  |
| AGL | I70   | ONERLIN                      | ONERLIN                | 10715. | 3498.  | 0.   | 0.11  | 0.09  |
| AGL | 38D   | SALEM AIRPARK INC            | SALEM                  | 10222. | 3327.  | 0.   | 0.10  | 0.09  |
| AGL | I51   | TYLER                        | ADERDEEN               | 4877.  | 6981.  | 0.   | 0.07  | 0.08  |
| AGL | 419   | MORROW COUNTY                | MT GILEAD              | 9229.  | 3013.  | 0.   | 0.10  | 0.08  |
| AGL | 2D1   | BARBER                       | ALLIANCE               | 8963.  | 2926.  | 0.   | 0.09  | 0.08  |
| AGL | I86   | PERRY COUNTY                 | NEW LEXINGTON          | 7694.  | 2511.  | 0.   | 0.08  | 0.07  |
| AGL | 6G4   | WYNKOOP                      | MT VERNON              | 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 | CRAFT                             | MIDDLE BASS ISLAND | OH | 2606.    | 2062.   | 0.    | 0.03  | 0.03  |
| AGL | 111  | 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 | 808  | KOONS                             | SALEM              | OH | 2273.    | 742.    | 0.    | 0.02  | 0.02  |
| AGL | OH06 | MILLS                             | MAINTUA            | 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                           | HAUSEON            | OH | 1239.    | 404.    | 0.    | 0.01  | 0.01  |
| AGL | PIR  | PIERRE MUNI                       | PIERRE             | SD | 857207.  | 246522. | 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 | 808 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  | 0.33  |
| 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           | SD | 7426.    | 2975.   | 0.    | 0.08  | 0.07  |
| AGL | 5V8  | KADOKA MUNI                       | KADOKA             | SD | 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         |                    | MOSTINEE          | 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. | 152221. | 284. | 2.21* | 2.95* |
| AGL C02  | PLAYBOY                   |                    | LAKE GENEVA       | WI | 222649. | 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 | 223634. | 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 W107 | WAUPUN                    |                    | WAUPUN            | WI | 44000.  | 87687.  | 0.   | 0.73  | 0.87  |
| AGL DEO  | OSCEOLA MUNI              |                    | OSCEOLA           | WI | 108432. | 23005.  | 96.  | 0.83  | 0.87  |
| AGL PDC  | RAIRIE DU CHIEN MUNI      |                    | RAIRIE 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-RAIRIE               |                    | RAIRIE DU SAC     | WI | 23159.  | 56042.  | 0.   | 0.42  | 0.53  |
| AGL 3W0  | 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               |                    | L.DYSMITH         | WI | 22023.  | 56071.  | 0.   | 0.41  | 0.52  |
| AGL W112 | AMERY MUNI                |                    | AMERY             | WI | 30086.  | 47818.  | 0.   | 0.45  | 0.52  |
| AGL 79C  | BRENNAND                  |                    | NEENAH            | WI | 48324.  | 26757.  | 158. | 0.52  | 0.50  |
| AGL SSQ  | SHELL LAKE MUNI           |                    | SHELL LAKE        | WI | 44277.  | 27663.  | 0.   | 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 W110 | WESTTOSHA                 |                    | 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  | 0.35  |
| 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                 |                    | DELAVER           | 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                 | WI | 33036. | 10782. | 0.  | 0.33 | 0.29 |
| AGL 47C  | BOSCOBEL                  | WI | 26513. | 15899. | 58. | 0.50 | 0.28 |
| AGL 73C  | LANCASTER MUNICIPAL       | WI | 15108. | 24449. | 0.  | 0.23 | 0.26 |
| AGL OCQ  | OCNTO MUNI                | WI | 18012. | 20589. | 0.  | 0.24 | 0.26 |
| AGL PKF  | PARK FALLS MUNI           | WI | 15241. | 24564. | 0.  | 0.23 | 0.26 |
| AGL D25  | MANITOWISH WATERS         | WI | 12910. | 23803. | 0.  | 0.21 | 0.24 |
| AGL WI06 | WAUNAKEE                  | WI | 20260. | 14358. | 0.  | 0.23 | 0.23 |
| AGL 58C  | TOBACCO CITY              | WI | 19992. | 12892. | 0.  | 0.23 | 0.22 |
| AGL C35  | REEDSBURG MUNI            | WI | 21026. | 11697. | 0.  | 0.75 | 0.22 |
| AGL Y50  | MAUTOMA MUNI              | WI | 21933. | 10777. | 0.  | 0.24 | 0.22 |
| AGL C69  | GONSTEAD                  | WI | 15101. | 10421. | 0.  | 0.17 | 0.17 |
| AGL 96C  | FOX RIVER                 | WI | 18122. | 5915.  | 0.  | 0.18 | 0.16 |
| AGL WI15 | BARRON MUNI               | WI | 13214. | 7066.  | 0.  | 0.14 | 0.13 |
| AGL D74  | SPARTA MUNI               | WI | 13460. | 4393.  | 0.  | 0.13 | 0.12 |
| AGL GTG  | GRANTSBURG MUNI           | WI | 6525.  | 12183. | 0.  | 0.10 | 0.12 |
| AGL C37  | BRODHEAD                  | WI | 12081. | 5045.  | 0.  | 0.12 | 0.11 |
| AGL Y23  | CHETEK MUNI-SOUTHWORTH    | WI | 9061.  | 5711.  | 0.  | 0.10 | 0.10 |
| AGL C76  | LODI LAKELAND             | WI | 10959. | 4678.  | 0.  | 0.11 | 0.10 |
| AGL 94C  | COWGILL FIELD             | WI | 9892.  | 3229.  | 0.  | 0.10 | 0.09 |
| AGL 61C  | FORT ATKINSON MUNI        | WI | 10697. | 3492.  | 0.  | 0.11 | 0.09 |
| AGL Y72  | BLOYER FIELD              | WI | 10070. | 3287.  | 0.  | 0.10 | 0.09 |
| AGL WI05 | BIG FOOT AIRFIELD         | WI | 7475.  | 6565.  | 0.  | 0.09 | 0.09 |
| AGL 52C  | FLYING HOOF               | WI | 3020.  | 6477.  | 0.  | 0.05 | 0.06 |
| AGL 82C  | MAUSTON-NEW LISBON UNION  | WI | 5409.  | 4199.  | 0.  | 0.06 | 0.06 |
| AGL 3D2  | EPHRAIM-FISH CREEK        | WI | 4200.  | 3805.  | 0.  | 0.05 | 0.05 |
| AGL 64C  | VINCENT                   | WI | 6041.  | 1972.  | 0.  | 0.05 | 0.05 |
| AGL 50C  | GROB                      | WI | 4656.  | 1520.  | 0.  | 0.05 | 0.04 |
| AGL 63C  | ADAMS COUNTY LEGION FIELD | WI | 4828.  | 1576.  | 0.  | 0.05 | 0.04 |
| AGL 62C  | HUNT FIELD                | WI | 4996.  | 1631.  | 0.  | 0.05 | 0.04 |
| AGL Y55  | CRANDON MUNI              | WI | 2948.  | 3396.  | 0.  | 0.04 | 0.04 |
| AGL WI04 | VERONA                    | WI | 4405.  | 1438.  | 0.  | 0.04 | 0.04 |

# NEW ENGLAND REGION

|         |                      |    |          |         |       |       |        |
|---------|----------------------|----|----------|---------|-------|-------|--------|
| ANE OXC | WATERBURY-OXFORD     | CT | 1074489. | 295102. | 1053. | 5.15  | 9.10   |
| ANE N04 | GRISWOLD             | CT | 197278.  | 139502. | 195.  | 1.68* | 2.24*  |
| ANE 5B3 | DANIELSON            | CT | 253545.  | 59483.  | 249.  | 1.66* | 2.08*  |
| ANE MMK | MERIDEN MARKHAM MUNI | CT | 113840.  | 133709. | 383.  | 2.90  | 1.64   |
| ANE 488 | ROBERTSON FIELD      | CT | 81970.   | 106584. | 0.    | 1.14  | 1.25   |
| ANE 788 | NEW LONDON-WATERFORD | CT | 58289.   | 124389. | 0.    | 1.08  | 1.21   |
| ANE 580 | WINDHAM              | CT | 117141.  | 30006.  | 400.  | 2.60  | 0.98   |
| ANE 489 | SIMSBURY TRI-TOWN    | CT | 28838.   | 103269. | 0.    | 0.66  | 0.88   |
| ANE 22B | JOHNNYCAKE           | CT | 40673.   | 28304.  | 0.    | 0.48  | 0.46   |
| ANE 789 | ELLINGTON            | CT | 38279.   | 12495.  | 0.    | 0.38  | 0.34   |
| ANE 786 | SKYLARK AIRPARK      | CT | 16536.   | 12858.  | 0.    | 0.20  | 0.20   |
| ANE 0N0 | ANSONIA              | CT | 1914.    | 625.    | 0.    | 0.02  | 0.02   |
| ANE 6B6 | MINUTE MAN AIRFIELD  | MA | 1330966. | 254029. | 1346. | 9.71* | 10.53* |
| ANE TAN | TAUNTON MUNI         | MA | 666084.  | 146678. | 655.  | 3.61  | 5.40   |
| ANE FIT | FITCHBURG            | MA | 607458.  | 202435. | 583.  | 4.80* | 5.38*  |
| ANE B09 | TEW-MAC              | MA | 561909.  | 149490. | 607.  | 3.62  | 4.73   |
| ANE 3B2 | MARSHFIELD           | MA | 398501.  | 149973. | 382.  | 2.79* | 3.64*  |
| ANE PVC | PROVINCETOWN MUNI    | MA | 342121.  | 163012. | 346.  | 3.13* | 3.36*  |
| ANE GBR | GREAT BARRINGTON     | MA | 336389.  | 109635. | 345.  | 2.23* | 2.96*  |
| ANE 0B5 | TURNERS FALLS        | MA | 316853.  | 64040.  | 304.  | 1.99* | 2.53*  |
| ANE PSF | PITTSFIELD MUNI      | MA | 170245.  | 146820. | 91.   | 3.32  | 2.11   |
| ANE 1B9 | MANSFIELD MUNI       | MA | 221630.  | 52787.  | 192.  | 1.42* | 1.82*  |
| ANE 0B6 | CHATHAM MUNI         | MA | 208922.  | 63987.  | 202.  | 1.40* | 1.81*  |

|     |      |                                    |                      |    |         |         |      |       |       |
|-----|------|------------------------------------|----------------------|----|---------|---------|------|-------|-------|
| ANE | PYM  | PLYMOUTH MUNI                      | PLYMOUTH             | MA | 183731. | 72828.  | 0.   | 1.95  | 1.70  |
| ANE | 3B0  | SOUTHBIDGE MUNI                    | SOUTHBIDGE           | 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 | 28091.  | 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. | 436.    | 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 | 8B8  | 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 | DNK  | 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 | 10630.  | 3469.   | 0.   | 0.11  | 0.09  |
| ANE | 821  | SUGARLOAF REGIONAL                 | CARRABASSETT         | ME | 6343.   | 2239.   | 0.   | 0.07  | 0.06  |
| ANE | 57B  | ISLESBORO                          | ISLESBORO            | ME | 7127.   | 2327.   | 0.   | 0.07  | 0.06  |
| ANE | 8B0  | RANGELEY MUNI                      | RANGELEY             | ME | 5808.   | 1895.   | 0.   | 0.06  | 0.05  |
| ANE | 59B  | NEWTON FIELD                       | JACKMAN              | ME | 4026.   | 1314.   | 0.   | 0.04  | 0.04  |
| ANE | 0B1  | COL DYKE FIELD                     | BETHEL               | ME | 611119. | 205315. | 611. | 3.46  | 5.42  |
| ANE | LCI  | LACONIA MUNI                       | LACONIA              | NH | 491982. | 187843. | 485. | 2.96  | 4.52  |
| ANE | EEN  | DILLANT-HOPKINS                    | KEENE                | NH | 304836. | 57600.  | 292. | 2.01* | 2.41* |
| ANE | BML  | BERLIN MUNI                        | BERLIN               | NH | 228754. | 93195.  | 208. | 1.53* | 2.14* |
| ANE | AFN  | JAFFREY MUNI-SILVER RANCH          | JAFFREY              | NH | 163334. | 142558. | 0.   | 6.76  | 2.03  |
| ANE | ASH  | BOIRE FIELD                        | NASHUA               | NH | 162771. | 63514.  | 0.   | 1.64  | 1.50  |
| ANE | 6B1  | SKYHAVEN                           | ROCHESTER            | NH | 30621.  | 96466.  | 0.   | 0.60  | 0.84  |
| ANE | CWN  | WHITE MOUNTAIN                     | NORTH CONWAY         | NH |         |         |      |       |       |

|     |      |                              |    |         |         |      |       |       |
|-----|------|------------------------------|----|---------|---------|------|-------|-------|
| ANE | CMH  | CLAREMONT MUNI               | NH | 71116.  | 20256.  | 67.  | 0.46* | 0.61* |
| ANE | HIE  | WHITEFIELD REGIONAL          | NH | 42096.  | 30140.  | 28.  | 0.81  | 0.48  |
| ANE | 783  | HAMPTON AIRFIELD             | NH | 19563.  | 6386.   | 0.   | 0.19  | 0.17  |
| ANE | 589  | DEAN MEMORIAL                | NH | 3171.   | 6749.   | 0.   | 0.05  | 0.07  |
| ANE | 283  | PARLIN FIELD                 | NH | 6667.   | 2176.   | 0.   | 0.07  | 0.06  |
| ANE | 284  | NEWPORT STATE                | RI | 639427. | 205065. | 723. | 3.06  | 5.61  |
| ANE | SFZ  | NORTH CENTRAL STATE          | RI | 176136. | 158604. | 2.   | 7.77  | 2.22  |
| ANE | WST  | WESTERLY STATE               | RI | 77599.  | 130689. | 0.   | 3.79  | 1.38  |
| ANE | BID  | BLOCK ISLAND STATE           | RI | 61565.  | 125350. | 1.   | 3.77  | 1.24  |
| ANE | 998  | QUONSET STATE                | RI | 148561. | 37549.  | 72.  | 1.93* | 1.24* |
| ANE | RI04 | RICHMOND                     | RI | 3397.   | 1109.   | 0.   | 0.03  | 0.03  |
| ANE | VSF  | SPRINGFIELD STATE /HARTNESS/ | VT | 197252. | 141772. | 162. | 1.59* | 2.25* |
| ANE | MPV  | EDWARD F KNAPP STATE         | VT | 95648.  | 123773. | 77.  | 1.26  | 1.46  |
| ANE | RUT  | RUTLAND STATE                | VT | 47951.  | 120993. | 1.   | 2.56  | 1.12  |
| ANE | 680  | MIDDLEBURY STATE             | VT | 49290.  | 57935.  | 0.   | 0.64  | 0.71  |
| ANE | 688  | CALEDONIA COUNTY             | VT | 75596.  | 13397.  | 71.  | 0.46* | 0.59* |
| ANE | MVL  | MORRISVILLE-STOWE STATE      | VT | 69587.  | 12402.  | 65.  | 0.42* | 0.54* |
| ANE | EFK  | MORRISVILLE STATE            | VT | 35555.  | 33664.  | 26.  | 0.46  | 0.34* |
| ANE | 187  | NEWPORT STATE                | VT | 43255.  | 7505.   | 42.  | 0.28* | 0.32  |
| ANE | 087  | FRANKLIN COUNTY              | VT | 36693.  | 11979.  | 0.   | 0.37  | 0.23  |
| ANE | 289  | WARREN-SUGARBUSH             | VT | 26579.  | 8675.   | 0.   | 0.27  | 0.23  |
| ANE | 685  | POST MILLS                   | VT | 7511.   | 2452.   | 0.   | 0.07  | 0.07  |
| ANE |      | CHAMPLAIN                    | VT |         |         |      |       |       |

# NORTHWEST REGION

|     |      |                               |    |          |         |       |        |        |
|-----|------|-------------------------------|----|----------|---------|-------|--------|--------|
| ANM | GXY  | WELD COUNTY MUNI              | CO | 2718554. | 573525. | 2508. | 16.91* | 21.87* |
| ANM | 3V5  | DOWNTOWN FORT COLLINS AIRPARK | CO | 878760.  | 257953. | 818.  | 5.68*  | 7.55*  |
| ANM | FNL  | FORT COLLINS-LOVELAND MUNI    | CO | 414931.  | 213962. | 1303. | 8.81   | 4.18   |
| ANM | EGE  | EAGLE COUNTY                  | CO | 405500.  | 177792. | 343.  | 2.73*  | 3.88*  |
| ANM | GUC  | GUNNISON COUNTY               | CO | 390324.  | 171297. | 365.  | 2.85*  | 3.73*  |
| ANM | SBS  | ROUTT COUNTY STOL             | CO | 309239.  | 156520. | 296.  | 2.49*  | 3.09*  |
| ANM | DN   | DURANGO-LA PLATA COUNTY       | CO | 235780.  | 163774. | 113.  | 1.83   | 2.65   |
| ANM | 48V  | TRI-COUNTY                    | CO | 235903.  | 106037. | 0.    | 2.35   | 2.27   |
| ANM | LHX  | LA JUNTA MUNI                 | CO | 272240.  | 66021.  | 222.  | 2.86   | 2.25   |
| ANM | MTJ  | MONTEROSE COUNTY              | CO | 163954.  | 148272. | 65.   | 5.19   | 2.05   |
| ANM | STK  | CROSSON FIELD                 | CO | 205554.  | 102993. | 171.  | 2.01   | 2.05   |
| ANM | 2V2  | LONGMONT MUNI                 | CO | 225767.  | 79039.  | 0.    | 1.93   | 2.03   |
| ANM | TAD  | LAS ANIMAS COUNTY             | CO | 184592.  | 84770.  | 175.  | 1.45*  | 1.79*  |
| ANM | IV5  | BOULDER MUNI                  | CO | 172139.  | 76101.  | 0.    | 1.81   | 1.65   |
| ANM | 01V  | COLUMBINE                     | CO | 179048.  | 58441.  | 0.    | 1.75   | 1.58   |
| ANM | LAA  | LAMAR MUNI                    | CO | 92215.   | 122514. | 64.   | 1.82   | 1.43   |
| ANM | GWS  | GLENWOOD SPRINGS MUNI         | CO | 60904.   | 121436. | 0.    | 1.02   | 1.21   |
| ANM | HDN  | YAMPA VALLEY                  | CO | 58840.   | 109667. | 20.   | 2.53   | 1.12   |
| ANM | 00V  | MEADOW LAKE                   | CO | 107842.  | 40545.  | 0.    | 1.08   | 0.99   |
| ANM | CEZ  | CORTEZ-MONTEZUMA COUNTY       | CO | 28303.   | 112036. | 15.   | 0.65   | 0.93   |
| ANM | AKO  | AKRON-WASHINGTON CO           | CO | 107443.  | 19921.  | 93.   | 1.10   | 0.85   |
| ANM | 5C00 | ANIMAS AIR PARK               | CO | 53197.   | 65257.  | 0.    | 0.69   | 0.79   |
| ANM | 2V5  | WRAY MUNI                     | CO | 48773.   | 62381.  | 0.    | 0.62   | 0.74   |
| ANM | 2V1  | STEVENS FIELD                 | CO | 34998.   | 67654.  | 0.    | 0.53   | 0.68   |
| ANM | 7V2  | NORTH FORK VALLEY             | CO | 14448.   | 82950.  | 0.    | 0.41   | 0.65   |
| ANM | 2V3  | MEEKER                        | CO | 30238.   | 63006.  | 0.    | 0.48   | 0.62   |
| ANM | CAG  | CRAIG-MOFFAT                  | CO | 65042.   | 25837.  | 0.    | 0.65   | 0.60   |
| ANM | 2V6  | YUMA MUNI                     | CO | 42316.   | 45685.  | 0.    | 0.52   | 0.58   |
| ANM | 1V9  | BLAKE FIELD                   | CO | 27132.   | 54057.  | 0.    | 0.44   | 0.54   |
| ANM | CO12 | BRIGHTON VAN-AIRE ESTATES     | CO | 59259.   | 19339.  | 0.    | 0.60   | 0.52   |
| ANM | GNB  | GRANBY-GRAND COUNTY           | CO | 13333.   | 58318.  | 0.    | 0.33   | 0.48   |

|     |      |                          |    |         |         |      |       |       |
|-----|------|--------------------------|----|---------|---------|------|-------|-------|
| ANM | RIL  | GARFIELD COUNTY          | CO | 31665.  | 36899.  | 0.   | 0.40  | 0.46  |
| ANM | 4V0  | RANGELY                  | CO | 44682.  | 19928.  | 0.   | 0.43  | 0.43  |
| ANM | 08V  | SAN LUIS VALLEY          | CO | 29180.  | 25493.  | 0.   | 0.34  | 0.36  |
| ANM | 0V2  | HARRIET ALEXANDER FIELD  | CO | 22180.  | 28519.  | 0.   | 0.29  | 0.34  |
| ANM | LXV  | LAKE COUNTY              | CO | 35057.  | 16788.  | 0.   | 0.36  | 0.34  |
| ANM | 1V8  | LEACH                    | CO | 31907.  | 13122.  | 0.   | 0.33  | 0.30  |
| ANM | 3V4  | FORT MORGAN MUNI         | CO | 36415.  | 9438.   | 119. | 0.77  | 0.30  |
| ANM | 3V1  | BURLINGTON MUNI          | CO | 23237.  | 15580.  | 0.   | 0.25  | 0.26  |
| ANM | 6V3  | LITTLETON                | CO | 28733.  | 9379.   | 0.   | 0.28  | 0.25  |
| ANM | 7V9  | CITY AND COUNTY          | CO | 20544.  | 17334.  | 0.   | 0.24  | 0.25  |
| ANM | 8V5  | HOLYOKE                  | CO | 21948.  | 13626.  | 0.   | 0.24  | 0.24  |
| ANM | 20V  | KREMMLING                | CO | 12444.  | 14689.  | 0.   | 0.16  | 0.18  |
| ANM | 6V6  | HOPKINS-MONTROSE COUNTY  | CO | 20244.  | 6607.   | 0.   | 0.20  | 0.18  |
| ANM | 1V6  | FREMONT COUNTY           | CO | 18775.  | 6128.   | 0.   | 0.18  | 0.17  |
| ANM | CO50 | ELLICOTT INTL            | CO | 18326.  | 5983.   | 0.   | 0.18  | 0.16  |
| ANM | 5V4  | CALHAN                   | CO | 18447.  | 6021.   | 0.   | 0.18  | 0.16  |
| ANM | 7V5  | BRUSH MUNI               | CO | 15239.  | 7791.   | 0.   | 0.15  | 0.15  |
| ANM | Q39  | MINERAL COUNTY MEMORIAL  | CO | 12121.  | 3956.   | 0.   | 0.12  | 0.11  |
| ANM | 7V8  | JULESBURG MUNI           | CO | 10827.  | 6260.   | 0.   | 0.11  | 0.11  |
| ANM | 33V  | WALDEN-JACKSON COUNTY    | CO | 8130.   | 2653.   | 0.   | 0.08  | 0.07  |
| ANM | 8V7  | SPRINGFIELD MUNI         | CO | 6727.   | 2196.   | 0.   | 0.07  | 0.06  |
| ANM | 9V7  | EADS MUNI                | CO | 6948.   | 2316.   | 0.   | 0.07  | 0.06  |
| ANM | 09V  | FOWLER                   | CO | 6730.   | 2197.   | 0.   | 0.07  | 0.06  |
| ANM | 7V1  | BUENA VISTA MUNI         | CO | 6097.   | 1990.   | 0.   | 0.06  | 0.05  |
| ANM | 8V1  | DEL NORTE MUN AND CO     | CO | 3320.   | 1084.   | 0.   | 0.03  | 0.03  |
| ANM | 4V1  | JOHNSON FIELD            | CO | 3572.   | 1166.   | 0.   | 0.04  | 0.03  |
| ANM | 29V  | VALLEY AIRPORT           | CO | 2997.   | 978.    | 0.   | 0.03  | 0.03  |
| ANM | 04V  | SAGUACHE MUNI            | CO | 1159.   | 378.    | 0.   | 0.01  | 0.01  |
| ANM | COE  | COEUR D ALENE AIR TERM   | ID | 780993. | 239949. | 690. | 4.97* | 6.78* |
| ANM | SUN  | FRIEDMAN MEMORIAL        | ID | 124990. | 146154. | 0.   | 1.60  | 1.80  |
| ANM | U35  | CALDWELL INDUSTRIAL      | ID | 111008. | 135721. | 0.   | 1.33  | 1.64  |
| ANM | S67  | NAMPA MUNI               | ID | 116434. | 94512.  | 0.   | 1.36  | 1.40  |
| ANM | MYL  | MC CALL                  | ID | 73252.  | 129269. | 0.   | 1.13  | 1.35  |
| ANM | S73  | KAMIAH MUNI              | ID | 63431.  | 106219. | 0.   | 0.96  | 1.13  |
| ANM | BYI  | BURLEY MUNI              | ID | 83833.  | 75472.  | 0.   | 3.65  | 1.06  |
| ANM | SMN  | SALMON                   | ID | 34489.  | 116619. | 0.   | 0.86  | 1.00  |
| ANM | U02  | MCCARLEY FLD             | ID | 56830.  | 90255.  | 0.   | 0.83  | 0.98  |
| ANM | U11  | REXBURG-MADISON COUNTY   | ID | 68932.  | 69492.  | 129. | 1.83  | 0.92  |
| ANM | S68  | OROFINO MUNI             | ID | 25625.  | 71310.  | 0.   | 0.49  | 0.64  |
| ANM | S80  | IDAHO COUNTY             | ID | 33237.  | 59277.  | 0.   | 0.51  | 0.61  |
| ANM | S86  | COUNTY-CITY              | ID | 43816.  | 42232.  | 0.   | 0.48  | 0.57  |
| ANM | S87  | WEISER MUNI              | ID | 47585.  | 17976.  | 0.   | 0.49  | 0.44  |
| ANM | U76  | MOUNTAIN HOME MUNI       | ID | 44497.  | 19341.  | 0.   | 0.47  | 0.42  |
| ANM | 655  | BOUNDARY COUNTY          | ID | 29636.  | 33850.  | 0.   | 0.39  | 0.42  |
| ANM | U59  | TETON PEAKS/DRIGGS MUNI/ | ID | 19584.  | 42705.  | 0.   | 0.33  | 0.41  |
| ANM | U01  | AMERICAN FALLS           | ID | 35710.  | 25142.  | 0.   | 0.40  | 0.40  |
| ANM | S83  | SHOSHONE COUNTY          | ID | 29596.  | 27874.  | 0.   | 0.30  | 0.38  |
| ANM | U15  | CHALLIS                  | ID | 32296.  | 40831.  | 0.   | 0.27  | 0.36  |
| ANM | U73  | JEROME COUNTY            | ID | 18230.  | 30168.  | 0.   | 0.35  | 0.32  |
| ANM | U12  | ST ANTHONY MUNI          | ID | 25385.  | 19531.  | 0.   | 0.27  | 0.32  |
| ANM | GNG  | GOODING MUNI             | ID | 37560.  | 10104.  | 0.   | 0.30  | 0.30  |
| ANM | 151  | ECKHART INTL             | ID | 7687.   | 30961.  | 0.   | 0.20  | 0.30  |
| ANM | S89  | CRAIGMONT MUNI           | ID | 23849.  | 7784.   | 0.   | 0.31  | 0.27  |
| ANM | S78  | EMMETT MUNI              | ID | 19066.  | 11041.  | 0.   | 0.24  | 0.21  |
| ANM | U57  | ARCO-BUTTE COUNTY        | ID | 20454.  | 7968.   | 0.   | 0.21  | 0.20  |
| ANM | U03  | BUHL MUNI                | ID | 15217.  | 7410.   | 0.   | 0.18  | 0.19  |
| ANM | U10  | PRESTON                  | ID | 14636.  | 5861.   | 0.   | 0.16  | 0.15  |
| ANM | U56  | RIGBY                    | ID | 10578.  | 9076.   | 0.   | 0.15  | 0.14  |
| ANM | U82  | COUNCIL MUNI             | ID |         |         | 0.   | 0.13  | 0.13  |

|          |                        |                  |         |         |      |       |       |
|----------|------------------------|------------------|---------|---------|------|-------|-------|
| ANM S75  | PAYETTE MUNI           | PAYETTE          | 11628.  | 3796.   | 0.   | 0.12  | 0.10  |
| ANM S62  | HENLEY AERODROME       | ATHOL            | 10628.  | 3469.   | 0.   | 0.10  | 0.09  |
| ANM S66  | HOMEDALE MUNI          | HOMEDALE         | 8941.   | 2918.   | 0.   | 0.09  | 0.08  |
| ANM U78  | SODA SPRINGS MUNI      | SODA SPRINGS     | 5554.   | 4256.   | 0.   | 0.07  | 0.07  |
| ANM S61  | ATHOL                  | ATHOL            | 7721.   | 2520.   | 0.   | 0.08  | 0.07  |
| ANM U36  | ABERDEEN MUNI          | ABERDEEN         | 7930.   | 2588.   | 0.   | 0.08  | 0.07  |
| ANM U107 | BEAR LAKE COUNTY       | PARIS            | 4923.   | 2627.   | 0.   | 0.05  | 0.05  |
| ANM U56  | PRIEST RIVER MUNI      | PRIEST RIVER     | 5292.   | 1727.   | 0.   | 0.05  | 0.05  |
| ANM DBS  | DUBOIS MUNI            | DUBOIS           | 3333.   | 1088.   | 0.   | 0.03  | 0.03  |
| ANM MLS  | FRANK WILEY FIELD      | MILES CITY       | 300836. | 98617.  | 261. | 3.99  | 2.65  |
| ANM OLF  | WOLF POINT INTL        | WOLF POINT       | 283622. | 110533. | 288. | 0.74* | 2.62* |
| ANM CTB  | CUT BANK MUNI          | CUT BANK         | 248884. | 71447.  | 228. | 2.74  | 2.13  |
| ANM SDY  | SYDNEY-RICHLAND MUNI   | SYDNEY           | 202255. | 89058.  | 186. | 2.48  | 1.94  |
| ANM DLN  | DILLON                 | DILLON           | 206166. | 47367.  | 209. | 1.51* | 1.68* |
| ANM BZN  | GALLATIN FLD           | BOZEMAN          | 95617.  | 128828. | 50.  | 1.88  | 1.49  |
| ANM BTM  | BERT MOONEY            | BUTTE            | 78559.  | 131000. | 0.   | 4.55  | 1.39  |
| ANM LWT  | LEWISTOWN MUNI         | LEWISTOWN        | 117864. | 59719.  | 284. | 3.67  | 1.18  |
| ANM LVM  | MISSION FIELD          | LIVINGSTON       | 40588.  | 89089.  | 0.   | 1.07  | 0.86  |
| ANM S01  | CONRAD                 | CONRAD           | 96557.  | 31908.  | 80.  | 1.23  | 0.85  |
| ANM GDV  | DAWSON COMMUNITY       | GLENDIVE         | 55565.  | 65067.  | 0.   | 2.49  | 0.80  |
| ANM SBX  | SHELBY                 | SHELBY           | 41847.  | 43987.  | 0.   | 1.67  | 0.57  |
| ANM HYS  | YELLOWSTONE            | WEST YELLOWSTONE | 11001.  | 63035.  | 0.   | 0.35  | 0.49  |
| ANM S27  | KALISPELL CITY         | KALISPELL        | 48761.  | 15915.  | 0.   | 0.51  | 0.43  |
| ANM 6S5  | HAMILTON               | HAMILTON         | 34711.  | 27821.  | 0.   | 0.42  | 0.42  |
| ANM 4U5  | CHOTEAU                | CHOTEAU          | 31987.  | 28223.  | 0.   | 0.40  | 0.40  |
| ANM PWD  | SHER-WOOD              | PLENTYWOOD       | 34285.  | 23809.  | 0.   | 0.40  | 0.39  |
| ANM RED  | RED LODGE              | RED LODGE        | 31972.  | 22114.  | 0.   | 0.37  | 0.36  |
| ANM MLK  | MALTA                  | MALTA            | 28141.  | 19336.  | 0.   | 0.33  | 0.32  |
| ANM S71  | CHINOOK MUNI           | CHINOOK          | 32946.  | 15748.  | 0.   | 0.36  | 0.32  |
| ANM 325  | STEVENSVILLE           | STEVENSVILLE     | 35470.  | 11579.  | 0.   | 0.37  | 0.31  |
| ANM MT02 | FAIRGROUNDS AIRPARK    | HARDIN           | 24230.  | 18877.  | 0.   | 0.28  | 0.29  |
| ANM 6S8  | LAUREL MUNI            | LAUREL           | 33285.  | 10863.  | 0.   | 0.34  | 0.29  |
| ANM 3U6  | BAKER MUNI             | BAKER            | 24531.  | 18158.  | 0.   | 0.29  | 0.28  |
| ANM S85  | BIG SKY FIELD          | CULBERTSON       | 31110.  | 10154.  | 0.   | 0.32  | 0.27  |
| ANM 4U6  | CIRCLE TOWN COUNTY     | CIRCLE           | 29395.  | 9594.   | 0.   | 0.30  | 0.26  |
| ANM BDX  | BROADUS                | BROADUS          | 22439.  | 14901.  | 0.   | 0.26  | 0.25  |
| ANM 650  | BIG TIMBER             | BIG TIMBER       | 20253.  | 16687.  | 0.   | 0.25  | 0.25  |
| ANM S59  | LIBBY                  | LIBBY            | 17609.  | 18367.  | 0.   | 0.23  | 0.24  |
| ANM 4U3  | LIBERTY COUNTY         | CHESTER          | 23131.  | 12544.  | 0.   | 0.26  | 0.24  |
| ANM U05  | RIDDICK FIELD          | PHILIPSBURG      | 15635.  | 18915.  | 0.   | 0.21  | 0.23  |
| ANM 851  | POLSON                 | POLSON           | 23598.  | 7702.   | 0.   | 0.24  | 0.21  |
| ANM 952  | SCOBAY                 | SCOBAY           | 23888.  | 7796.   | 0.   | 0.25  | 0.21  |
| ANM 3U3  | ANACONDA               | ANACONDA         | 18373.  | 10991.  | 0.   | 0.21  | 0.20  |
| ANM 153  | TILLITT FIELD          | FORSYTH          | 21195.  | 6918.   | 0.   | 0.22  | 0.19  |
| ANM 385  | DEER LODGE-CITY-COUNTY | DEER LODGE       | 19323.  | 8820.   | 0.   | 0.21  | 0.19  |
| ANM 8U8  | TOWNSEND               | TOWNSEND         | 19823.  | 6470.   | 0.   | 0.21  | 0.17  |
| ANM 9U0  | TURNER                 | TURNER           | 16641.  | 5966.   | 0.   | 0.18  | 0.15  |
| ANM 653  | COLUMBUS               | COLUMBUS         | 10499.  | 8421.   | 0.   | 0.13  | 0.13  |
| ANM 405  | EUREKA                 | EUREKA           | 13117.  | 4281.   | 0.   | 0.14  | 0.12  |
| ANM 757  | VALIER                 | VALIER           | 9089.   | 2967.   | 0.   | 0.09  | 0.08  |
| ANM 3U4  | ST LABRE MISSION       | ASHLAND          | 3795.   | 6723.   | 0.   | 0.06  | 0.07  |
| ANM 8U6  | TERRY                  | TERRY            | 5414.   | 1767.   | 0.   | 0.06  | 0.05  |
| ANM 5U2  | EKALAKA                | EKALAKA          | 5284.   | 1724.   | 0.   | 0.05  | 0.05  |
| ANM 485  | HARLEM                 | HARLEM           | 4958.   | 1618.   | 0.   | 0.05  | 0.04  |
| ANM 564  | STANFORD               | STANFORD         | 4711.   | 1538.   | 0.   | 0.05  | 0.04  |
| ANM 295  | GARDINER               | GARDINER         | 3724.   | 1215.   | 0.   | 0.04  | 0.03  |
| ANM 425  | POPLAR                 | POPLAR           | 2873.   | 938.    | 0.   | 0.03  | 0.03  |
| ANM 3U8  | BIG SANDY              | BIG SANDY        | 3450.   | 1126.   | 0.   | 0.04  | 0.03  |
| ANM 5U3  | BIG SKY                | ENNIS            | 1450.   | 473.    | 0.   | 0.01  | 0.01  |

|                  |                                  |    |          |         |       |        |        |
|------------------|----------------------------------|----|----------|---------|-------|--------|--------|
| ANM 352          | AURORA STATE                     | OR | 2861942. | 597135. | 2639. | 17.77* | 22.98* |
| ANM 0TH          | NORTH BEND MUNI                  | OR | 1970991. | 437321. | 1982. | 6.74   | 16.00  |
| ANM 455          | MC MINNVILLE MUNI                | OR | 1146481. | 303476. | 1049. | 7.33*  | 9.63*  |
| ANM CVO          | CORVALLIS MUNI                   | OR | 666785.  | 225747. | 518.  | 4.49   | 5.93   |
| ANM 154          | SCAPPOOSE INDUSTRIAL AIRPARK     | OR | 514667.  | 194922. | 422.  | 3.16*  | 4.71*  |
| ANM S07          | BEND MUNI                        | OR | 409943.  | 186542. | 335.  | 4.74   | 3.96   |
| ANM LGD          | LA GRANDE MUNI                   | OR | 402081.  | 165349. | 388.  | 3.04*  | 3.77*  |
| ANM DLS          | THE DALLES MUNI                  | OR | 425002.  | 141167. | 405.  | 3.03*  | 3.76*  |
| ANM RDM          | ROBERTS FIELD                    | OR | 362245.  | 175710. | 316.  | 4.84   | 3.57   |
| ANM ONP          | NEWPORT MUNI                     | OR | 269098.  | 113113. | 264.  | 2.25   | 2.54   |
| ANM LKV          | LAKE COUNTY-LAKEVIEW             | OR | 249750.  | 122707. | 245.  | 2.16*  | 2.47*  |
| ANM S12          | ALBANY MUNI                      | OR | 161124.  | 157953. | 0.    | 2.07   | 2.12   |
| ANM 358          | JOSEPHINE COUNTY /GRANTS PASS/   | OR | 125129.  | 145904. | 0.    | 1.71   | 1.80   |
| ANM ONO          | ONTARIO MUNI                     | OR | 104988.  | 135877. | 0.    | 4.91   | 1.60   |
| ANM 256          | SPORTSMAN AIRPARK                | OR | 136655.  | 93507.  | 0.    | 1.40   | 1.53   |
| ANM RBG          | ROSEBURG MUNI                    | OR | 93078.   | 135700. | 2.    | 4.26   | 1.52   |
| ANM S03          | ASHLAND MUNI-SUMNER PARKER FIELD | OR | 87940.   | 134066. | 0.    | 1.34   | 1.48   |
| ANM S05          | BANDON STATE                     | OR | 77677.   | 130714. | 0.    | 1.27   | 1.38   |
| ANM 451          | GOLD BEACH MUNI                  | OR | 73072.   | 129210. | 0.    | 1.23   | 1.34   |
| ANM BND          | BURNS MUNI                       | OR | 67557.   | 127410. | 0.    | 1.26   | 1.30   |
| ANM 61S          | COTTAGE GROVE STATE              | OR | 61602.   | 125467. | 0.    | 1.10   | 1.24   |
| ANM S22          | HERMISTON MUNICIPAL              | OR | 73022.   | 107764. | 2.    | 2.99   | 1.20   |
| ANM 755          | INDEPENDENCE STATE               | OR | 59170.   | 86748.  | 0.    | 0.84   | 0.97   |
| ANM 052          | OREGON CITY AIRPARK              | OR | 87960.   | 46978.  | 0.    | 0.87   | 0.90   |
| ANM 753          | STARK'S TWIN OAKS AIRPARK        | OR | 93951.   | 30660.  | 0.    | 0.91   | 0.83   |
| ANM BOK          | BROOKINGS STATE                  | OR | 55297.   | 64579.  | 0.    | 0.61   | 0.80   |
| ANM 452          | HOOD RIVER                       | OR | 49411.   | 62653.  | 0.    | 0.69   | 0.74   |
| ANM S21          | SUNRIVER                         | OR | 38000.   | 66059.  | 0.    | 0.56   | 0.69   |
| ANM BKE          | BAKER MUNI                       | OR | 41221.   | 51575.  | 0.    | 1.66   | 0.62   |
| ANM 759          | LENHARDT AIRPARK                 | OR | 61552.   | 20086.  | 0.    | 0.60   | 0.54   |
| ANM 77S          | HOBBY FIELD                      | OR | 43060.   | 32034.  | 0.    | 0.40   | 0.50   |
| ANM 459          | MULINO                           | OR | 53045.   | 17315.  | 0.    | 0.52   | 0.47   |
| ANM S30          | LEBANON STATE                    | OR | 37619.   | 33788.  | 0.    | 0.45   | 0.47   |
| ANM 959          | LEXINGTON                        | OR | 28952.   | 37010.  | 0.    | 0.38   | 0.44   |
| ANM 652          | FLORENCE MUNI                    | OR | 18907.   | 47385.  | 0.    | 0.34   | 0.44   |
| ANM 854          | ENTERPRISE MUNI                  | OR | 16887.   | 40632.  | 0.    | 0.33   | 0.38   |
| ANM S45          | SILETZ BAY STATE                 | OR | 18174.   | 38076.  | 0.    | 0.30   | 0.37   |
| ANM 359          | CONDON STATE                     | OR | 24097.   | 29076.  | 0.    | 0.33   | 0.35   |
| ANM S6S          | SEASIDE STATE                    | OR | 18015.   | 34413.  | 0.    | 0.28   | 0.35   |
| ANM S33          | CITY-COUNTY                      | OR | 31955.   | 16370.  | 3.    | 1.21   | 0.32   |
| ANM 16S          | TRI-CITY STATE                   | OR | 30554.   | 15974.  | 0.    | 0.33   | 0.31   |
| ANM S39          | PRINEVILLE                       | OR | 26255.   | 18417.  | 0.    | 0.30   | 0.30   |
| ANM S59          | ESTACADA                         | OR | 32707.   | 10675.  | 0.    | 0.32   | 0.29   |
| ANM U33          | JOHN DAY STATE                   | OR | 21056.   | 19966.  | 0.    | 0.23   | 0.27   |
| ANM 26U          | MC DERMITT STATE                 | OR | 18716.   | 15664.  | 0.    | 0.22   | 0.23   |
| ANM 257          | CHILOQUIN STATE                  | OR | 10173.   | 24829.  | 0.    | 0.19   | 0.23   |
| ANM 03S          | RICHES                           | OR | 24178.   | 7890.   | 0.    | 0.23   | 0.21   |
| ANM 46S          | JOE CARDS AIRPARK                | OR | 15907.   | 10750.  | 0.    | 0.17   | 0.18   |
| ANM 0R78         | DANIELS FIELD                    | OR | 11471.   | 15349.  | 0.    | 0.16   | 0.18   |
| ANM 10S          | HUTCHINSON                       | OR | 19730.   | 6438.   | 0.    | 0.19   | 0.17   |
| ANM S48          | COUNTRY SQUIRE AIRPARK           | OR | 18814.   | 6140.   | 0.    | 0.18   | 0.17   |
| ANM 354          | ILLINOIS VALLEY /USFS/           | OR | 18200.   | 5939.   | 0.    | 0.18   | 0.16   |
| ANM S49          | MILLER MEMORIAL AIRPARK          | OR | 12918.   | 9775.   | 0.    | 0.14   | 0.15   |
| ANM S50          | OKRIDGE STATE                    | OR | 4533.    | 18158.  | 0.    | 0.10   | 0.15   |
| ANM S47          | TILLAMOOK                        | OR | 10068.   | 6798.   | 0.    | 0.12   | 0.11   |
| ANM 62S          | CHRISTMAS VALLEY                 | OR | 7532.    | 8017.   | 0.    | 0.09   | 0.10   |
| ANM S51          | GEORGE FELT                      | OR | 9523.    | 3108.   | 0.    | 0.09   | 0.08   |
| ANM 0R62         | CROW-MAG                         | OR | 8375.    | 2733.   | 0.    | 0.08   | 0.07   |
| ANM 654          | DAVIS                            | OR | 4834.    | 1577.   | 0.    | 0.05   | 0.04   |
| AURORA           |                                  |    |          |         |       |        |        |
| NORTH BEND       |                                  |    |          |         |       |        |        |
| MC MINNVILLE     |                                  |    |          |         |       |        |        |
| CORVALLIS        |                                  |    |          |         |       |        |        |
| SCAPPOOSE        |                                  |    |          |         |       |        |        |
| BEND             |                                  |    |          |         |       |        |        |
| LA GRANDE        |                                  |    |          |         |       |        |        |
| THE DALLES       |                                  |    |          |         |       |        |        |
| REDMOND          |                                  |    |          |         |       |        |        |
| NEWPORT          |                                  |    |          |         |       |        |        |
| LAKEVIEW         |                                  |    |          |         |       |        |        |
| ALBANY           |                                  |    |          |         |       |        |        |
| GRANTS PASS      |                                  |    |          |         |       |        |        |
| ONTARIO          |                                  |    |          |         |       |        |        |
| NEWBERG          |                                  |    |          |         |       |        |        |
| ROSEBURG         |                                  |    |          |         |       |        |        |
| ASHLAND          |                                  |    |          |         |       |        |        |
| BANDON           |                                  |    |          |         |       |        |        |
| GOLD BEACH       |                                  |    |          |         |       |        |        |
| BURNS            |                                  |    |          |         |       |        |        |
| COTTAGE GROVE    |                                  |    |          |         |       |        |        |
| HERMISTON        |                                  |    |          |         |       |        |        |
| INDEPENDENCE     |                                  |    |          |         |       |        |        |
| OREGON CITY      |                                  |    |          |         |       |        |        |
| HILLSBORO        |                                  |    |          |         |       |        |        |
| BROOKINGS        |                                  |    |          |         |       |        |        |
| HOOD RIVER       |                                  |    |          |         |       |        |        |
| BEND             |                                  |    |          |         |       |        |        |
| BAKER            |                                  |    |          |         |       |        |        |
| HUBBARD          |                                  |    |          |         |       |        |        |
| CRESWELL         |                                  |    |          |         |       |        |        |
| MULINO           |                                  |    |          |         |       |        |        |
| LEBANON          |                                  |    |          |         |       |        |        |
| LEXINGTON        |                                  |    |          |         |       |        |        |
| FLORENCE         |                                  |    |          |         |       |        |        |
| ENTERPRISE       |                                  |    |          |         |       |        |        |
| GLENEDEN BEACH   |                                  |    |          |         |       |        |        |
| CONDON           |                                  |    |          |         |       |        |        |
| SEASIDE          |                                  |    |          |         |       |        |        |
| MADRAS           |                                  |    |          |         |       |        |        |
| MYRTLE CREEK     |                                  |    |          |         |       |        |        |
| PRINEVILLE       |                                  |    |          |         |       |        |        |
| ESTACADA         |                                  |    |          |         |       |        |        |
| JOHN DAY         |                                  |    |          |         |       |        |        |
| MC DERMITT       |                                  |    |          |         |       |        |        |
| CHILOQUIN        |                                  |    |          |         |       |        |        |
| SANDY            |                                  |    |          |         |       |        |        |
| DALLAS           |                                  |    |          |         |       |        |        |
| HARRISBURG       |                                  |    |          |         |       |        |        |
| MOLALLA          |                                  |    |          |         |       |        |        |
| SANDY            |                                  |    |          |         |       |        |        |
| CAVE JUNCTION    |                                  |    |          |         |       |        |        |
| VALE             |                                  |    |          |         |       |        |        |
| OKRIDGE          |                                  |    |          |         |       |        |        |
| TILLAMOOK        |                                  |    |          |         |       |        |        |
| CHRISTMAS VALLEY |                                  |    |          |         |       |        |        |
| ROSEBURG         |                                  |    |          |         |       |        |        |
| ELMIRA           |                                  |    |          |         |       |        |        |
| GATES            |                                  |    |          |         |       |        |        |

|     |      |                              |                        |          |         |       |       |       |
|-----|------|------------------------------|------------------------|----------|---------|-------|-------|-------|
| ANM | OR06 | INLAND HELICOPTERS           | GRANTS PASS            | 762.     | 5808.   | 0.    | 0.03  | 0.04  |
| ANM | S15  | TROH'S MEMORIAL AIRPARK      | PORTLAND               | 2810.    | 917.    | 0.    | 0.03  | 0.02  |
| ANM | 415  | ROGUE-AIR                    | SHADY COVE             | 2240.    | 1399.   | 0.    | 0.02  | 0.02  |
| ANM | PVU  | PROVO MUNI                   | PROVO                  | 195080.  | 169036. | 0.    | 7.27  | 2.42  |
| ANM | VEL  | VERNAL                       | VERNAL                 | 168945.  | 139895. | 125.  | 2.52  | 2.05  |
| ANM | LGU  | LOGAN-CACHE                  | LOGAN                  | 121033.  | 144870. | 0.    | 4.13  | 1.77  |
| ANM | BTF  | SALT LAKE SKYPARK            | BOUNTIFUL              | 93920.   | 136023. | 0.    | 1.42  | 1.53  |
| ANM | BMC  | BRIGHTMAN CITY               | BRIGHTMAN CITY         | 123832.  | 105920. | 84.   | 1.78  | 1.53  |
| ANM | U42  | SALT LAKE CITY MUNI 2        | SALT LAKE CITY         | 134209.  | 80020.  | 0.    | 1.51  | 1.42  |
| ANM | SGU  | SAINT GEORGE MUNI            | ST. GEORGE             | 66300.   | 126983. | 1.    | 2.72  | 1.28  |
| ANM | CDC  | CEDAR CITY MUNI              | CEDAR CITY             | 57536.   | 122871. | 8.    | 2.63  | 1.20  |
| ANM | RIF  | RICHFIELD MUNI               | RICHFIELD              | 55785.   | 123571. | 0.    | 1.07  | 1.19  |
| ANM | PUC  | CARBON COUNTY                | PRICE                  | 48095.   | 121025. | 0.    | 0.97  | 1.12  |
| ANM | BDG  | BLANDING MUNI                | BLANDING               | 48203.   | 106673. | 22.   | 1.35  | 1.03  |
| ANM | KNB  | KANAB MUNI                   | KANAB                  | 27864.   | 114457. | 0.    | 0.77  | 0.95  |
| ANM | 69V  | HUNTINGTON MUNI              | HUNTINGTON             | 27865.   | 114458. | 0.    | 0.77  | 0.95  |
| ANM | DTA  | DELTA MUNI                   | DELTA                  | 25188.   | 111480. | 0.    | 0.69  | 0.91  |
| ANM | U20  | GREEN RIVER                  | GREEN RIVER            | 10418.   | 105966. | 0.    | 0.55  | 0.77  |
| ANM | U77  | SPANISH FORK-SPRINGVILLE     | SPANISH FORK           | 45446.   | 69571.  | 0.    | 0.62  | 0.76  |
| ANM | U43  | SAN JUAN COUNTY              | MONTICELLO             | 8901.    | 99237.  | 0.    | 0.45  | 0.72  |
| ANM | U69  | DUCHESNE MUNI                | DUCHESNE               | 64706.   | 38877.  | 58.   | 0.46* | 0.69* |
| ANM | 36U  | HEBER VALLEY                 | HEBER                  | 56317.   | 42889.  | 0.    | 0.65  | 0.66  |
| ANM | BCE  | BRYCE CANYON                 | BRYCE CANYON           | 53543.   | 35399.  | 50.   | 0.54* | 0.59* |
| ANM | 74V  | ROOSEVELT MUNI               | ROOSEVELT              | 7228.    | 81696.  | 0.    | 0.33  | 0.59  |
| ANM | CNY  | CANYONLANDS FIELD            | MOAB                   | 21855.   | 61895.  | 0.    | 0.69  | 0.56  |
| ANM | U55  | PANGUITCH MUNI               | PANGUITCH              | 4393.    | 61589.  | 0.    | 0.24  | 0.44  |
| ANM | ENV  | WENDOVER                     | WENDOVER               | 34145.   | 24688.  | 0.    | 0.40  | 0.39  |
| ANM | 41U  | MANTI-EPHRAIM                | MANTI                  | 10556.   | 41789.  | 0.    | 0.23  | 0.35  |
| ANM | U27  | TREMONTON MUNI               | TREMONTON              | 26871.   | 11581.  | 0.    | 0.27  | 0.26  |
| ANM | U07  | BULLFROG BASIN               | GLEN CANYON NATL REC A | 8826.    | 24779.  | 0.    | 0.16  | 0.22  |
| ANM | U26  | BOLINDER FIELD-TOOELE VALLEY | TOOELE                 | 20648.   | 6741.   | 0.    | 0.20  | 0.18  |
| ANM | U14  | NEPHI MUNI                   | NEPHI                  | 12166.   | 3242.   | 0.    | 0.12  | 0.10  |
| ANM | 42U  | MORGAN MUNI                  | MORGAN                 | 9731.    | 5341.   | 0.    | 0.10  | 0.10  |
| ANM | 44U  | SALINA-GUNNISON              | SALINA                 | 8637.    | 4329.   | 0.    | 0.09  | 0.09  |
| ANM | HVE  | HANKSVILLE                   | HANKSVILLE             | 7665.    | 2502.   | 0.    | 0.07  | 0.07  |
| ANM | 1L9  | PAROWAN                      | PAROWAN                | 7666.    | 2502.   | 0.    | 0.07  | 0.07  |
| ANM | 40U  | MANILA                       | MANILA                 | 7665.    | 2502.   | 0.    | 0.07  | 0.07  |
| ANM | U22  | HALLS CROSSING               | GLEN CANYON NATL REC A | 5606.    | 3277.   | 0.    | 0.06  | 0.06  |
| ANM | U52  | BEAVER MUNI                  | BEAVER                 | 5837.    | 1905.   | 0.    | 0.06  | 0.05  |
| ANM | 1L8  | HURRICANE                    | HURRICANE              | 4707.    | 1536.   | 0.    | 0.05  | 0.04  |
| ANM | 1L7  | ESCALANTE MUNI               | ESCALANTE              | 4580.    | 1495.   | 0.    | 0.04  | 0.04  |
| ANM | 38U  | WAYNE WONDERLAND             | LOA                    | 2037.    | 1223.   | 0.    | 0.02  | 0.02  |
| ANM | PWT  | KITSAF COUNTY                | BREMERTON              | 2173096. | 455431. | 2148. | 9.53  | 17.46 |
| ANM | KLS  | KELSO-LONGVIEW               | KELSO                  | 1134135. | 196488. | 987.  | 6.51* | 8.84* |
| ANM | EPH  | EPHRATA MUNI                 | EPHRATA                | 913816.  | 167440. | 738.  | 6.73  | 7.18  |
| ANM | RLD  | RICHLAND                     | RICHLAND               | 680080.  | 244497. | 419.  | 8.51  | 6.14  |
| ANM | HQM  | BOWERMAN                     | HOQUIAM                | 593344.  | 199012. | 503.  | 4.44  | 5.26  |
| ANM | PUM  | PULLMAN/MOSCOW REGIONAL      | PULLMAN/MOSCOW, ID     | 522310.  | 194358. | 336.  | 2.48  | 4.76  |
| ANM | S50  | AUBURN MUNI                  | AUBURN                 | 448766.  | 251836. | 0.    | 3.97  | 4.66  |
| ANM | BLI  | BELLINGHAM INTL              | BELLINGHAM             | 492608.  | 195431. | 469.  | 5.11  | 4.57  |
| ANM | S88  | ARLINGTON                    | ARLINGTON              | 402942.  | 235427. | 0.    | 13.51 | 4.24  |
| ANM | 150  | PUYALLUP INDUSTRIAL AIRPARK  | PUYALLUP               | 339359.  | 216125. | 0.    | 3.18  | 3.69  |
| ANM | 595  | EVERGREEN FIELD              | VANCOUVER              | 333633.  | 110209. | 0.    | 3.26  | 2.95  |
| ANM | EAT  | PANGBORN FIELD               | WENATCHEE              | 186394.  | 165129. | 2.    | 6.76  | 2.34  |
| ANM | CLM  | WILLIAM R FAIRCHILD INTL     | PORT ANGELES           | 155750.  | 156074. | 6.    | 5.21  | 2.07  |
| ANM | 60S  | PEARSON AIRPARK              | VANCOUVER              | 216835.  | 70782.  | 0.    | 5.40  | 1.91  |
| ANM | SHN  | SANDERSON FIELD              | SHELTON                | 136387.  | 111303. | 426.  | 2.85  | 1.65  |
| ANM | 519  | FRIDAY HARBOR                | FRIDAY HARBOR          | 101958.  | 138637. | 0.    | 1.17  | 1.60  |

|     |      |                          |                       |    |         |         |      |       |       |
|-----|------|--------------------------|-----------------------|----|---------|---------|------|-------|-------|
| ANM | 544  | SPANAWAY                 | SPANAWAY              | WA | 186129. | 47180.  | 119. | 1.35* | 1.55* |
| ANM | 755  | 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 | ELM  | BOWERS FIELD             | ELLENBURG             | WA | 147862. | 26034.  | 138. | 0.90* | 1.16* |
| ANM | 517  | ORCAS ISLAND             | EAST SOUND            | WA | 37425.  | 117577. | 0.   | 0.81  | 1.03  |
| ANM | 765  | OAK HARBOR AIR PARK      | OAK HARBOR            | WA | 27391.  | 114304. | 0.   | 0.59  | 0.94  |
| ANM | S43  | HARVEY FIELD             | SHOHMISH              | WA | 103645. | 33830.  | 0.   | 0.96  | 0.91  |
| ANM | S31  | LOPEZ ISLAND             | LOPEZ                 | WA | 35908.  | 100787. | 0.   | 0.61  | 0.91  |
| ANM | 056  | CLARK COUNTY             | ORCHARDS              | WA | 99219.  | 36077.  | 0.   | 1.04  | 0.90  |
| ANM | 075  | 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 | 058  | 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 | 745  | ANACORTES                | ANACORTES             | WA | 59322.  | 19366.  | 0.   | 0.53  | 0.52  |
| ANM | 145  | 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 | 059  | 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  | OMK                      | OMK                   | 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 | 635  | 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 | 155  | SUNNYSIDE MUNI           | SUNNYSIDE             | WA | 19072.  | 11044.  | 0.   | 0.21  | 0.20  |
| ANM | 852  | CASHMERE-DRYDEN          | CASHMERE              | WA | 20312.  | 9583.   | 0.   | 0.21  | 0.20  |
| ANM | S94  | WHITMAN CO MEMORIAL      | COLEFAX               | WA | 21437.  | 6997.   | 0.   | 0.20  | 0.19  |
| ANM | WA56 | KURTZER FLYING SERVICE   | SEATTLE               | WA | 20051.  | 6544.   | 0.   | 0.17  | 0.18  |
| ANM | 115  | 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 | 254  | 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 | 057  | 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 | WA0  | (NEW)                    | BLAINE                | WA | 15355.  | 5012.   | 0.   | 0.04  | 0.14  |
| ANM | S35  | 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 | 685  | DAVENPORT                | DAVENPORT             | WA | 13643.  | 4453.   | 0.   | 0.13  | 0.12  |
| ANM | WA33 | LYNDEN                   | LYNDEN                | WA | 13436.  | 4386.   | 0.   | 0.13  | 0.12  |
| ANM | 255  | WATERVILLE               | WATERVILLE            | WA | 13075.  | 4268.   | 0.   | 0.13  | 0.12  |
| ANM | 705  | MEAD FLYING SERVICE      | MEAD                  | WA | 13062.  | 4264.   | 0.   | 0.13  | 0.12  |
| ANM | 335  | PRO FIELD                | RITZVILLE             | WA | 13285.  | 4336.   | 0.   | 0.13  | 0.12  |
| ANM | WA69 | WAX ORCHARDS             | VASHON                | WA | 12295.  | 4013.   | 0.   | 0.11  | 0.11  |
| ANM | 251  | WASHON 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 | WA24 | FRIDAY HARBOR SPB        | FRIDAY HARBOR         | WA | 8717.   | 3928.   | 0.   | 0.09  | 0.08  |
| ANM | WA24 | FRIDAY HARBOR SPB        | FRIDAY HARBOR         | WA | 8717.   | 3928.   | 0.   | 0.09  | 0.08  |

|          |                                 |    |         |         |      |       |       |
|----------|---------------------------------|----|---------|---------|------|-------|-------|
| ANM 735  | WILLARD FIELD                   | WA | 8971.   | 2928.   | 0.   | 0.09  | 0.08  |
| ANM S23  | IONE MUNI                       | WA | 8524.   | 2782.   | 0.   | 0.09  | 0.08  |
| ANM WA20 | SWANSON                         | WA | 7775.   | 2538.   | 0.   | 0.08  | 0.07  |
| ANM 258  | WILBUR                          | WA | 8114.   | 2648.   | 0.   | 0.09  | 0.07  |
| ANM WA43 | ODESSA MUNI                     | WA | 8353.   | 2726.   | 0.   | 0.08  | 0.07  |
| ANM WA21 | GRAND COULEE DAM                | WA | 8101.   | 2644.   | 0.   | 0.06  | 0.07  |
| ANM 80WA | QUINCY MUNI                     | WA | 7190.   | 2347.   | 0.   | 0.06  | 0.06  |
| ANM WA35 | CEDAR GROVE AIRPARK             | WA | 5268.   | 1720.   | 0.   | 0.05  | 0.05  |
| ANM S93  | CLE ELUM                        | WA | 6198.   | 2023.   | 0.   | 0.05  | 0.05  |
| ANM 259  | WILLAPA HARBOR                  | WA | 5020.   | 1638.   | 0.   | 0.04  | 0.04  |
| ANM WA4  | FERRY COUNTY                    | WA | 3503.   | 1143.   | 0.   | 0.03  | 0.03  |
| ANM WA15 | COULEE CITY                     | WA | 523.    | 171.    | 0.   | 0.01  | 0.00  |
| ANM GCC  | GILLETTE-CAMPBELL COUNTY        | WY | 774168. | 234677. | 779. | 5.70* | 6.70* |
| ANM COD  | CODY MUNI                       | WY | 375192. | 166536. | 375. | 2.90* | 3.60* |
| ANM SHR  | SHERIDAN COUNTY                 | WY | 330111. | 167556. | 291. | 4.02  | 3.31  |
| ANM RKS  | ROCK SPRINGS-SWEETWATER COUNTY  | WY | 332127. | 164702. | 314. | 3.36  | 3.30  |
| ANM JAC  | JACKSON HOLE                    | WY | 301308. | 160165. | 280. | 3.16  | 3.07  |
| ANM RNL  | RAWLINS MUNI                    | WY | 243696. | 146368. | 244. | 2.07* | 2.59* |
| ANM R1H  | RIVERTON REGIONAL               | WY | 214949. | 143896. | 203. | 2.40  | 2.38  |
| ANM LAR  | GENERAL BREESES FIELD           | WY | 207849. | 143611. | 190. | 2.15  | 2.34  |
| ANM GEY  | SOUTH BIG HORN COUNTY           | WY | 78587.  | 131012. | 0.   | 1.31  | 1.39  |
| ANM EVW  | EVANSTON MUNI                   | WY | 60628.  | 125150. | 0.   | 1.12  | 1.23  |
| ANM BPI  | BIG PINEY MUNI                  | WY | 62842.  | 108255. | 50.  | 1.29  | 1.14  |
| ANM DGM  | CONVERSE COUNTY                 | WY | 46586.  | 105878. | 0.   | 0.82  | 1.01  |
| ANM WRL  | WORLAND MUNI                    | WY | 23116.  | 112907. | 0.   | 0.74  | 0.90  |
| ANM AFO  | AFTON MUNI                      | WY | 24370.  | 98657.  | 0.   | 0.59  | 0.82  |
| ANM POY  | POWELL MUNI                     | WY | 21150.  | 97503.  | 0.   | 0.56  | 0.79  |
| ANM TOR  | TORRINGTON MUNI                 | WY | 28419.  | 80736.  | 0.   | 0.55  | 0.73  |
| ANM BYG  | BUFFALO MUNI                    | WY | 40926.  | 60042.  | 57.  | 1.48  | 0.67  |
| ANM U68  | NORTH BIG HORN COUNTY           | WY | 21085.  | 61427.  | 0.   | 0.40  | 0.55  |
| ANM PNA  | RALPH WENZ FIELD                | WY | 22704.  | 55231.  | 0.   | 0.40  | 0.52  |
| ANM ECS  | MONDELL FIELD                   | WY | 29996.  | 44517.  | 70.  | 0.96  | 0.50  |
| ANM SAA  | SHIVELY FIELD                   | WY | 19230.  | 54290.  | 0.   | 0.37  | 0.49  |
| ANM EAM  | PHIFER AIRFIELD                 | WY | 38997.  | 12728.  | 0.   | 0.40  | 0.34  |
| ANM FBR  | FORT BRIDGER                    | WY | 28284.  | 9019.   | 27.  | 0.19* | 0.25* |
| ANM LSK  | LUSK MUNI                       | WY | 11653.  | 18167.  | 0.   | 0.17  | 0.20  |
| ANM THP  | HOT SPRINGS CO-THERMOPOLIS MUNI | WY | 19668.  | 6401.   | 0.   | 0.20  | 0.17  |
| ANM EMM  | KEMMERER MUNI                   | WY | 13468.  | 4395.   | 0.   | 0.14  | 0.12  |
| ANM HAD  | HARFORD FIELD                   | WY | 11119.  | 3630.   | 0.   | 0.11  | 0.10  |
| ANM 46U  | ALPINE                          | WY | 6403.   | 2090.   | 0.   | 0.06  | 0.06  |
| ANM U25  | DUBOIS                          | WY | 6203.   | 2024.   | 0.   | 0.06  | 0.05  |
| ANM 79V  | EVANS                           | WY | 4977.   | 1625.   | 0.   | 0.05  | 0.04  |

# SOUTHERN REGION

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

|          |                          |                   |          |         |       |        |        |
|----------|--------------------------|-------------------|----------|---------|-------|--------|--------|
| ASO 1A8  | WALKER COUNTY            | JASPER            | 299822.  | 51804.  | 279.  | 1.74   | 2.32   |
| ASO 1A9  | WEEBON FIELD             | EUFULA            | 279933.  | 45546.  | 276.  | 1.47   | 2.16   |
| ASO 1A9  | LEE MERKLE FLD           | SYLACAUGA         | 253004.  | 68050.  | 217.  | 1.52*  | 2.13*  |
| ASO 12X  | THOMAS C RUSSELL FLD     | ALEXANDER CITY    | 149109.  | 134281. | 120.  | 1.47*  | 1.88*  |
| ASO 12J  | BRENTON MUNI             | BRENTON           | 195548.  | 79953.  | 137.  | 3.26   | 1.83   |
| ASO 1B2  | HUNTSVILLE AIRPORT NORTH | HUNTSVILLE        | 197757.  | 60530.  | 161.  | 1.23*  | 1.72*  |
| ASO 1R8  | BAY MINETTE MUNI         | BAY MINETTE       | 195109.  | 34904.  | 175.  | 1.01   | 1.53   |
| ASO 2A3  | BESSEMER                 | BESSEMER          | 137208.  | 59500.  | 0.    | 5.24   | 1.31   |
| ASO 1A9  | AUTAUGA COUNTY           | PRATTVILLE        | 106206.  | 34665.  | 0.    | 1.03   | 0.94   |
| ASO 8A8  | ALBERTVILLE MUNI         | ALBERTVILLE       | 116217.  | 22174.  | 96.   | 0.68*  | 0.92*  |
| ASO 1PLR | ST CLAIR COUNTY          | PELL CITY         | 110886.  | 24963.  | 66.   | 1.15*  | 0.90*  |
| ASO 1EDM | ENTERPRISE MUNI          | ENTERPRISE        | 100643.  | 32858.  | 0.    | 0.94   | 0.89   |
| ASO 4R4  | FAIRHOPE MUNI            | FAIRHOPE          | 43111.   | 61148.  | 5.    | 1.78   | 0.69   |
| ASO 7A2  | DENOPOLIS MUNI           | DENOPOLIS         | 85963.   | 15642.  | 76.   | 0.49*  | 0.68*  |
| ASO 1SEM | CRAIG FIELD              | SELMA             | 66698.   | 28111.  | 0.    | 0.62   | 0.62   |
| ASO 1HAB | MARION COUNTY            | HAMILTON          | 65479.   | 18928.  | 53.   | 0.57   | 0.56   |
| ASO 1A94 | CENTRE MUNI              | CENTRE            | 63133.   | 11859.  | 53.   | 0.46   | 0.50   |
| ASO 06A  | MOTON FIELD              | TUSKEGEE          | 30580.   | 42033.  | 12.   | 0.60   | 0.48   |
| ASO 3A1  | FOLSOM FIELD             | CULLMAN           | 54597.   | 14296.  | 171.  | 1.03   | 0.46   |
| ASO 1M4  | POSEY FIELD              | HALEYVILLE        | 55370.   | 10889.  | 44.   | 0.38   | 0.44   |
| ASO 1PRM | GREENVILLE MUNI          | GREENVILLE        | 44040.   | 19452.  | 41.   | 0.31*  | 0.42*  |
| ASO 1M22 | RUSSELLVILLE MUNI        | RUSSELLVILLE      | 44865.   | 14643.  | 0.    | 0.43   | 0.40   |
| ASO 0R1  | ATHORE MUNI              | ATHORE            | 44369.   | 14483.  | 0.    | 0.41   | 0.39   |
| ASO 79J  | ANDALUSIA-OPP            | ANDALUSIA & OPP   | 20786.   | 23654.  | 0.    | 0.27   | 0.30   |
| ASO 1MVC | MONROE COUNTY            | MONROEVILLE       | 36674.   | 8239.   | 23.   | 0.30   | 0.38   |
| ASO 5M8  | ROUNTREE FIELD           | HARTSELLE         | 24992.   | 17012.  | 0.    | 0.27   | 0.28   |
| ASO 26A  | ASHLAND/LINEVILLE        | ASHLAND/LINEVILLE | 11535.   | 24745.  | 0.    | 0.17   | 0.24   |
| ASO 8A1  | GUNTERSVILLE MUNI        | GUNTERSVILLE      | 16753.   | 17274.  | 0.    | 0.20   | 0.23   |
| ASO 7A3  | LANETT MUNI              | LANETT            | 23824.   | 7276.   | 79.   | 0.52   | 0.21   |
| ASO 1M38 | HAZEL GREEN              | HAZEL GREEN       | 21240.   | 6933.   | 0.    | 0.21   | 0.19   |
| ASO 33J  | GENEVA MUNI              | GENEVA            | 16712.   | 11078.  | 0.    | 0.20   | 0.18   |
| ASO 0J6  | HEADLAND MUNI            | HEADLAND          | 19311.   | 6304.   | 0.    | 0.19   | 0.17   |
| ASO 5R4  | FOLEY MUNI               | FOLEY             | 18958.   | 6188.   | 0.    | 0.19   | 0.17   |
| ASO 20A  | ROBBINS FIELD            | ONEONTA           | 16614.   | 5424.   | 0.    | 0.16   | 0.15   |
| ASO 1A15 | JACK EDWARDS             | GULF SHORES       | 16716.   | 5456.   | 0.    | 0.15   | 0.15   |
| ASO 02A  | GRAGG FIELD              | CLANTON           | 16983.   | 5543.   | 0.    | 0.17   | 0.15   |
| ASO 09A  | BUTLER-CHOCTAW COUNTY    | BUTLER            | 15566.   | 5081.   | 0.    | 0.15   | 0.14   |
| ASO 7A0  | GREENSBORO MUNI          | GREENSBORO        | 14367.   | 4690.   | 0.    | 0.14   | 0.13   |
| ASO 4A9  | ISBELL FIELD             | FORT PAYNE        | 12226.   | 3991.   | 0.    | 0.12   | 0.11   |
| ASO 1AIV | GEORGE DOWNER            | ALICEVILLE        | 12286.   | 4010.   | 0.    | 0.12   | 0.11   |
| ASO 4A6  | SCOTTSBORO MUNI          | SCOTTSBORO        | 10904.   | 3559.   | 0.    | 0.11   | 0.10   |
| ASO 0A8  | BIBB COUNTY              | CENTREVILLE       | 11893.   | 3882.   | 0.    | 0.12   | 0.10   |
| ASO 14J  | ELBA MUNI                | ELBA              | 9976.    | 3256.   | 0.    | 0.10   | 0.09   |
| ASO 1A98 | VAIDEN FIELD             | MARION            | 9401.    | 3069.   | 0.    | 0.09   | 0.08   |
| ASO 1M95 | RICHARD ARTHUR FIELD     | FAYETTE           | 6790.    | 5034.   | 0.    | 0.08   | 0.08   |
| ASO 4R3  | JACKSON MUNI             | JACKSON           | 7229.    | 2359.   | 0.    | 0.07   | 0.06   |
| ASO 4R9  | DAUPHIN ISLAND           | DAUPHIN ISLAND    | 5667.    | 1850.   | 0.    | 0.05   | 0.05   |
| ASO 23A  | HALLARD                  | YORK              | 3963.    | 1294.   | 0.    | 0.04   | 0.03   |
| ASO TIX  | TITUSVILLE-COcoa         | TITUSVILLE        | 1592981. | 346963. | 1524. | 10.02* | 12.89* |
| ASO 34J  | NEW SMYRNA BEACH MUNI    | NEW SMYRNA BEACH  | 1142448. | 229706. | 1013. | 6.45*  | 9.12*  |
| ASO 81J  | DESTIN-FT WALTON BEACH   | DESTIN            | 1139186. | 222809. | 1412. | 7.17*  | 9.05*  |
| ASO 5F8  | SANFORD                  | SANFORD           | 947404.  | 176231. | 867.  | 5.51*  | 7.47*  |
| ASO 1AL  | LAKELAND MUNI            | LAKELAND          | 778472.  | 227770. | 504.  | 10.93  | 6.98   |
| ASO 1MTH | MARATHON FLIGHT STRIP    | MARATHON          | 734861.  | 227505. | 683.  | 4.71*  | 6.39*  |
| ASO 1FPR | ST LUCIE COUNTY          | FORT PIERCE       | 677898.  | 221222. | 0.    | 3.66   | 5.97   |
| ASO 4GIF | WINTER HAVEN'S GILBERT   | WINTER HAVEN      | 682839.  | 126278. | 626.  | 4.24*  | 5.38*  |
| ASO X47  | FLAGLER COUNTY           | BUNNELL           | 645748.  | 126748. | 592.  | 3.84*  | 5.33*  |
| ASO 1SGJ | ST AUGUSTINE             | ST AUGUSTINE      | 645825.  | 149669. | 532.  | 4.84   | 5.23   |
| ASO 1CEM | BOB SIKES                | CRESTVIEW         | 533884.  | 101560. | 723.  | 3.02*  | 4.22*  |

|     |      |                                     |       |         |         |      |       |       |
|-----|------|-------------------------------------|-------|---------|---------|------|-------|-------|
| ASO | OCF  | OCALA MUNI /JIM TAYLOR FIELD/       | OCALA | 419037. | 187460. | 374. | 5.39  | 4.03  |
| ASO | OMN  | MUNICIPAL AIRPORT, ORMOND BEACH     | FL    | 474992. | 108607. | 396. | 4.07  | 3.88  |
| ASO | LNA  | PALM BEACH COUNTY PARK              | FL    | 344749. | 187701. | 178. | 5.96  | 3.54  |
| ASO | TPF  | PETER O KNIGHT                      | FL    | 331886. | 90357.  | 275. | 4.11  | 2.81  |
| ASO | APF  | NAPLES MUNI                         | FL    | 195195. | 169066. | 0.   | 8.81  | 2.42  |
| ASO | COI  | MERRITT ISLAND                      | FL    | 207236. | 136809. | 0.   | 2.19  | 2.29  |
| ASO | MAI  | MARIANNA MUNI                       | FL    | 269371. | 62583.  | 319. | 1.30  | 2.21  |
| ASO | VNC  | VENICE MUNI                         | FL    | 228693. | 97978.  | 0.   | 2.24  | 2.17  |
| ASO | BCT  | BOCA RATON PUBLIC                   | FL    | 181367. | 141778. | 0.   | 1.99  | 2.15  |
| ASO | MYK  | MARCO ISLAND                        | FL    | 173638. | 134398. | 166. | 1.58* | 2.08* |
| ASO | SUA  | WITHAM FIELD                        | FL    | 180617. | 133059. | 0.   | 1.95  | 2.08  |
| ASO | X26  | SEBASTIAN MUNI                      | FL    | 227274. | 77005.  | 0.   | 2.17  | 2.02  |
| ASO | X51  | HOMESTEAD GENERAL AVIATION          | FL    | 225542. | 73620.  | 0.   | 2.15  | 1.99  |
| ASO | X17  | PLANT CITY MUNI                     | FL    | 204762. | 55517.  | 136. | 2.05  | 1.73  |
| ASO | BKV  | HERNANDO COUNTY                     | FL    | 181406. | 65864.  | 133. | 2.05  | 1.64  |
| ASO | PGD  | CHARLOTTE COUNTY                    | FL    | 105108. | 139667. | 0.   | 4.65  | 1.63  |
| ASO | CLW  | CLEARWATER EXECUTIVE                | FL    | 178216. | 66885.  | 0.   | 1.71  | 1.63  |
| ASO | PHK  | PALM BEACH CO GLADES                | FL    | 164075. | 73055.  | 92.  | 3.12  | 1.58  |
| ASO | X46  | OPA LOCKA WEST                      | FL    | 163285. | 53301.  | 0.   | 1.55  | 1.44  |
| ASO | DED  | DELAND MUNI-SIDNEY H TAYLOR FLD     | FL    | 145860. | 65096.  | 0.   | 3.93  | 1.40  |
| ASO | 23J  | HERLONG                             | FL    | 145903. | 59295.  | 0.   | 1.42  | 1.36  |
| ASO | ISM  | KISSIMMEE MUNI                      | FL    | 79836.  | 122863. | 1.   | 3.24  | 1.35  |
| ASO | X16  | VANDENBERG                          | FL    | 144031. | 55723.  | 0.   | 1.39  | 1.33  |
| ASO | SEE  | SEBRING AIRPORT AND INDUSTRIAL PARK | FL    | 153315. | 45345.  | 0.   | 0.66  | 1.32  |
| ASO | LEE  | LEESBURG MUNI                       | FL    | 107793. | 75985.  | 0.   | 1.15  | 1.22  |
| ASO | X59  | VALKARIA                            | FL    | 135494. | 44234.  | 0.   | 0.59  | 1.19  |
| ASO | 68J  | TALLAHASSEE COMMERCIAL              | FL    | 134493. | 44295.  | 118. | 0.82* | 1.19* |
| ASO | BOW  | BARTOW MUNI                         | FL    | 98666.  | 73009.  | 0.   | 1.07  | 1.14  |
| ASO | 82J  | FERGUSON                            | FL    | 113639. | 45780.  | 0.   | 1.11  | 1.06  |
| ASO | 24J  | SUWANNEE COUNTY                     | FL    | 27408.  | 114310. | 0.   | 0.77  | 0.94  |
| ASO | 31J  | LAKE CITY MUNI                      | FL    | 39254.  | 94367.  | 19.  | 1.52  | 0.89  |
| ASO | X21  | ARTHUR DUNN AIR PARK                | FL    | 72862.  | 25373.  | 0.   | 0.70  | 0.65  |
| ASO | AVO  | AVON PARK MUNI                      | FL    | 52050.  | 31539.  | 0.   | 0.54  | 0.56  |
| ASO | 28J  | KAY LARKIN                          | FL    | 46878.  | 32784.  | 0.   | 0.50  | 0.53  |
| ASO | 55J  | FERNANDINA BEACH MUNI               | FL    | 53383.  | 26110.  | 0.   | 0.53  | 0.53  |
| ASO | 2J9  | QUINCY MUNI                         | FL    | 58290.  | 21902.  | 0.   | 0.56  | 0.53  |
| ASO | OBE  | OKEECHOBEE COUNTY                   | FL    | 46289.  | 26815.  | 0.   | 0.47  | 0.49  |
| ASO | 2R4  | MILTON T FIELD                      | FL    | 50313.  | 22273.  | 0.   | 0.50  | 0.48  |
| ASO | X07  | LAKE WALES MUNI                     | FL    | 37521.  | 35469.  | 0.   | 0.43  | 0.48  |
| ASO | X39  | TAMPA DOWNS                         | FL    | 42515.  | 19728.  | 0.   | 0.42  | 0.41  |
| ASO | X06  | ARCADIA MUNI                        | FL    | 44385.  | 16269.  | 0.   | 0.43  | 0.40  |
| ASO | IMM  | IMMOKALEE                           | FL    | 43673.  | 17132.  | 0.   | 0.43  | 0.40  |
| ASO | X53  | CLEWISTON                           | FL    | 32308.  | 16803.  | 0.   | 0.31  | 0.33  |
| ASO | CITY | CROSS CITY                          | FL    | 34707.  | 9761.   | 26.  | 0.55  | 0.30  |
| ASO | X14  | LABELLE MUNICIPAL                   | FL    | 28076.  | 14983.  | 0.   | 0.28  | 0.29  |
| ASO | ZPH  | ZEPHYRHILLS MUNI                    | FL    | 27479.  | 11870.  | 0.   | 0.27  | 0.26  |
| ASO | 40J  | PERRY-FOLEY                         | FL    | 15277.  | 22470.  | 0.   | 0.70  | 0.25  |
| ASO | X33  | SILVER SPRINGS FLY-N STRIP          | FL    | 25134.  | 9985.   | 0.   | 0.24  | 0.23  |
| ASO | 42J  | KEYSTONE AIRPARK                    | FL    | 24805.  | 9296.   | 0.   | 0.27  | 0.23  |
| ASO | X10  | BELLE GLADE STATE/MARPT/            | FL    | 24463.  | 7985.   | 0.   | 0.23  | 0.22  |
| ASO | 54J  | DEFUNIAK SPRINGS                    | FL    | 21594.  | 8217.   | 0.   | 0.21  | 0.20  |
| ASO | X60  | WILLISTON MUNI                      | FL    | 18986.  | 9105.   | 0.   | 0.19  | 0.19  |
| ASO | CDK  | GEORGE T LEWIS                      | FL    | 18552.  | 8929.   | 0.   | 0.18  | 0.18  |
| ASO | X01  | EVERGLADES                          | FL    | 12635.  | 4123.   | 0.   | 0.12  | 0.11  |
| ASO | 01J  | HILLIARD AIRPARK                    | FL    | 11095.  | 3621.   | 0.   | 0.11  | 0.10  |
| ASO | 0J9  | CALHOUN COUNTY                      | FL    | 9357.   | 5929.   | 0.   | 0.10  | 0.10  |
| ASO | X22  | WAUCHULA MUNI                       | FL    | 10652.  | 6787.   | 0.   | 0.10  | 0.09  |
| ASO | X13  | CARRABELLE FLIGHT STRIP             | FL    | 6787.   | 2215.   | 0.   | 0.06  | 0.06  |
| ASO | AAF  | APALACHICOLA MUNI                   | FL    | 5459.   | 3068.   | 0.   | 0.06  | 0.06  |
| ASO | 215  | AIRGLADES                           | FL    | 2343.   | 765.    | 0.   | 0.02  | 0.02  |

| ASO     | WDR     | WINDER                         | WINDER         | 408643. | 67449.  | 341. | 2.34  | 3.16  |
|---------|---------|--------------------------------|----------------|---------|---------|------|-------|-------|
| ASO 8A4 | ASO 8A4 | MCCOLLUM                       | MARIETTA       | 335324. | 97184.  | 956. | 6.19  | 2.87  |
| ASO SBO | ASO SBO | EMANUEL COUNTY                 | SAWINSBORO     | 343522. | 52397.  | 288. | 1.87* | 2.69* |
| ASO AMG | ASO AMG | BACON COUNTY                   | ALMA           | 300431. | 52397.  | 260. | 1.71  | 2.34  |
| ASO RMG | ASO RMG | RICHARD B RUSSELL              | ROME           | 187233. | 142301. | 137. | 2.37  | 2.19  |
| ASO DNL | ASO DNL | DANIEL FIELD                   | AUGUSTA        | 186376. | 115569. | 158. | 1.27* | 2.01* |
| ASO 02J | ASO 02J | CRISP COUNTY-CORDELE           | CORDELE        | 246533. | 45558.  | 200. | 1.56  | 1.92  |
| ASO 17A | ASO 17A | WINNETT COUNTY                 | LAURENCEVILLE  | 220721. | 67654.  | 437. | 4.60  | 1.94  |
| ASO AYS | ASO AYS | WAYCROSS-WARE COUNTY           | WAYCROSS       | 205189. | 67606.  | 172. | 1.19* | 1.81* |
| ASO 4A4 | ASO 4A4 | CORNELIUS-MOORE FIELD          | CEDARTOWN      | 229544. | 39764.  | 202. | 1.33* | 1.79* |
| ASO BQK | ASO BQK | GLYNCO JETPORT                 | BRUNSWICK      | 122443. | 141056. | 0.   | 1.49  | 1.75  |
| ASO LGC | ASO LGC | CALLAWAY                       | LA GRANGE      | 208997. | 39429.  | 184. | 1.24  | 1.65  |
| ASO MAC | ASO MAC | HERBERT SMART DOWNTOWN         | MACON          | 184622. | 58165.  | 153. | 1.08* | 1.61* |
| ASO PIM | ASO PIM | CALLAWAY GARDENS-HARRIS COUNTY | PINE MOUNTAIN  | 185729. | 31923.  | 170. | 1.36  | 1.45  |
| ASO TOC | ASO TOC | TOCCOA                         | TOCCOA         | 168158. | 35150.  | 121. | 2.05  | 1.35  |
| ASO CCO | ASO CCO | NEWMAN COMETA COUNTY           | YEMM           | 155517. | 40148.  | 515. | 3.52  | 1.30  |
| ASO CTJ | ASO CTJ | WEST GEORGIA REGIONAL          | CARROLLTON     | 142485. | 50292.  | 362. | 4.30  | 1.28  |
| ASO VDI | ASO VDI | VIDALIA MUNI                   | VIDALIA        | 149371. | 27214.  | 123. | 0.92  | 1.17  |
| ASO GVL | ASO GVL | LEE GILMER MEMORIAL            | GAINESVILLE    | 129640. | 46494.  | 12.  | 3.59  | 1.17  |
| ASO MGR | ASO MGR | MOULTRIE MUNICIPAL             | MOULTRIE       | 74791.  | 96950.  | 222. | 1.67  | 1.14  |
| ASO DNN | ASO DNN | DALTON MUNI                    | DALTON         | 96335.  | 49900.  | 0.   | 3.32  | 0.97  |
| ASO DBN | ASO DBN | DUBLIN MUNI                    | DUBLIN         | 115964. | 22130.  | 90.  | 0.95  | 0.92  |
| ASO 6A0 | ASO 6A0 | CARTERSVILLE                   | CARTERSVILLE   | 113105. | 24259.  | 72.  | 0.75* | 0.91* |
| ASO 2A9 | ASO 2A9 | FALCON FLD                     | PEACHTREE CITY | 103062. | 27106.  | 317. | 2.12  | 0.86  |
| ASO 9A1 | ASO 9A1 | COVINGTON MUNI                 | COVINGTON      | 101542. | 27777.  | 261. | 1.92  | 0.86  |
| ASO ACJ | ASO ACJ | SOUTHERN FIELD                 | AMERICUS       | 83427.  | 28618.  | 0.   | 0.77  | 0.74  |
| ASO TBR | ASO TBR | STATESBORO MUNI                | STATESBORO     | 64627.  | 45594.  | 0.   | 1.34  | 0.73  |
| ASO 9A7 | ASO 9A7 | SOUTH EXPRESSWAY               | JONESBORO      | 83154.  | 27145.  | 0.   | 0.77  | 0.73  |
| ASO 54A | ASO 54A | PERRY-FORT VALLEY              | PERRY          | 72690.  | 23728.  | 0.   | 1.75  | 0.64  |
| ASO 52A | ASO 52A | MADISON MUNI                   | MADISON        | 76255.  | 13095.  | 68.  | 0.46* | 0.59* |
| ASO TVI | ASO TVI | THOMASVILLE MUNI               | THOMASVILLE    | 67481.  | 19632.  | 116. | 1.33  | 0.58  |
| ASO CZL | ASO CZL | TOM B. DAVID FLD               | CALHOUN        | 64646.  | 21099.  | 0.   | 0.59  | 0.57  |
| ASO 48A | ASO 48A | COCHRAN                        | COCHRAN        | 45356.  | 31675.  | 40.  | 0.44  | 0.55  |
| ASO 18J | ASO 18J | DOUGLAS MUNI                   | DOUGLAS        | 57049.  | 10044.  | 49.  | 0.37  | 0.45  |
| ASO 2A4 | ASO 2A4 | WASHINGTON-WILKES COUNTY       | WASHINGTON     | 49392.  | 14352.  | 86.  | 0.77  | 0.42  |
| ASO TMA | ASO TMA | HENRY TIFT MYERS               | TIFTON         | 52077.  | 9064.   | 46.  | 0.45* | 0.41* |
| ASO 09J | ASO 09J | JEKYLL ISLAND                  | JEKYLL ISLAND  | 48912.  | 13496.  | 120. | 0.81  | 0.41  |
| ASO 27A | ASO 27A | ELBERT COUNTY-PATZ FIELD       | ELBERTON       | 45115.  | 14729.  | 0.   | 0.66  | 0.40  |
| ASO CXU | ASO CXU | CAMILLA-MITCHELL COUNTY        | CAMILLA        | 34937.  | 24438.  | 0.   | 0.36  | 0.39  |
| ASO 4J2 | ASO 4J2 | BERRIEN CO                     | NASHVILLE      | 42726.  | 13948.  | 37.  | 0.39  | 0.38  |
| ASO MLJ | ASO MLJ | BALDWIN COUNTY                 | MILLEDGEVILLE  | 48826.  | 8407.   | 43.  | 0.29* | 0.38* |
| ASO 84A | ASO 84A | MATHIS                         | CUMMING        | 48826.  | 8407.   | 43.  | 0.29* | 0.38* |
| ASO 2A2 | ASO 2A2 | REGINALD GRANT MEMORIAL        | THOMASTON      | 41757.  | 13630.  | 0.   | 0.38  | 0.37  |
| ASO 2J3 | ASO 2J3 | LOUISVILLE MUNICIPAL           | LOUISVILLE     | 37553.  | 18463.  | 0.   | 0.36  | 0.37  |
| ASO 20J | ASO 20J | COMMODORE-DECATUR              | BAINBRIDGE     | 38283.  | 12496.  | 0.   | 1.01  | 0.34  |
| ASO 46J | ASO 46J | HAZLEHURST                     | HAZLEHURST     | 32064.  | 19692.  | 0.   | 0.32  | 0.34  |
| ASO 75J | ASO 75J | TURNER COUNTY                  | ASHBURN        | 33741.  | 17248.  | 17.  | 0.25* | 0.34* |
| ASO 70J | ASO 70J | CAIRO-GRADY COUNTY             | CAIRO          | 37116.  | 12115.  | 0.   | 1.12  | 0.33  |
| ASO 50A | ASO 50A | HABERSHAM COUNTY               | CORNELIA       | 32547.  | 10624.  | 0.   | 0.30  | 0.29  |
| ASO 16J | ASO 16J | DAWSON MUNI                    | DAWSON         | 33045.  | 10787.  | 0.   | 0.78  | 0.29* |
| ASO FZG | ASO FZG | FITZGERALD MUNI                | FITZGERALD     | 37024.  | 6847.   | 30.  | 0.20* | 0.29* |
| ASO 07J | ASO 07J | EASTMAN-DODGE COUNTY           | EASTMAN        | 29260.  | 9552.   | 0.   | 0.27  | 0.26  |
| ASO 2J7 | ASO 2J7 | BURKE COUNTY                   | WAYNESBORO     | 28200.  | 9294.   | 0.   | 0.26  | 0.25  |
| ASO 8A9 | ASO 8A9 | SOUTH FULTON SKY PORT          | FAIRBURN       | 28468.  | 9294.   | 0.   | 0.27  | 0.25  |
| ASO 5A2 | ASO 5A2 | WARNER ROBINS AIRPARK          | WARNER ROBINS  | 26087.  | 8514.   | 0.   | 0.24  | 0.23  |
| ASO 15J | ASO 15J | COOK COUNTY                    | ADEL           | 25003.  | 8160.   | 0.   | 0.23  | 0.22  |
| ASO 4J6 | ASO 4J6 | ST MARYS                       | ST MARYS       | 24577.  | 8022.   | 0.   | 0.23  | 0.22  |
| ASO 11J | ASO 11J | EARLY COUNTY                   | BLAKELY        | 24491.  | 7993.   | 0.   | 1.06  | 0.22  |
| ASO 30J | ASO 30J | BAXLEY MUNI                    | BAXLEY         |         |         | 0.   |       |       |

|     |     |                                    |               |        |        |     |      |      |
|-----|-----|------------------------------------|---------------|--------|--------|-----|------|------|
| ASO | A06 | MONROE MUNI                        | MONROE        | 7448.  | 22818. | 0.  | 0.21 | 0.20 |
| ASO | 46A | BLAIRSVILLE                        | BLAIRSVILLE   | 7059.  | 21626. | 0.  | 0.20 | 0.19 |
| ASO | SYV | SYLVESTER                          | SYLVESTER     | 6695.  | 20506. | 0.  | 0.19 | 0.18 |
| ASO | 6A2 | GRIFFIN-SPALDING COUNTY            | GRIFFIN       | 6756.  | 20695. | 0.  | 0.19 | 0.18 |
| ASO | 53A | MONTEZUMA MUNI                     | MONTEZUMA     | 6685.  | 20581. | 0.  | 0.19 | 0.18 |
| ASO | 17J | DONALSONVILLE MUNI                 | DONALSONVILLE | 6446.  | 19748. | 0.  | 0.18 | 0.17 |
| ASO | 2J2 | LIBERTY COUNTY                     | HINESVILLE    | 14201. | 11338. | 0.  | 0.14 | 0.17 |
| ASO | MQM | TELFAIR-WHEELER                    | MCRAE         | 4598.  | 19518. | 10. | 0.15 | 0.16 |
| ASO | 4J5 | QUITMAN BROOKS COUNTY              | QUITMAN       | 5971.  | 18288. | 0.  | 0.17 | 0.16 |
| ASO | 65J | WRENS MEMORIAL                     | WRENS         | 4775.  | 14629. | 0.  | 0.13 | 0.13 |
| ASO | BGE | DECATUR COUNTY INDUSTRIAL AIR PARK | BAINBRIDGE    | 4879.  | 14950. | 0.  | 0.15 | 0.13 |
| ASO | 56J | PLANTATION ARPK                    | SYLVANIA      | 4697.  | 14339. | 0.  | 0.13 | 0.13 |
| ASO | 19A | JACKSON COUNTY                     | JEFFERSON     | 4535.  | 13895. | 0.  | 0.13 | 0.12 |
| ASO | 2J4 | METTER MUNI                        | METTER        | 4218.  | 12922. | 0.  | 0.12 | 0.11 |
| ASO | 5A9 | ROOSEVELT MEMORIAL                 | WARM SPRINGS  | 4139.  | 12679. | 0.  | 0.12 | 0.11 |
| ASO | 6A1 | BUTLER MUNI                        | BUTLER        | 3771.  | 11550. | 0.  | 0.11 | 0.10 |
| ASO | 19J | HOMERVILLE                         | HOMERVILLE    | 3692.  | 11313. | 0.  | 0.10 | 0.10 |
| ASO | 9A5 | BARWICK LAFAYETTE                  | LAFAYETTE     | 3597.  | 11019. | 0.  | 0.10 | 0.10 |
| ASO | RVJ | REIDSVILLE                         | REIDSVILLE    | 3421.  | 10483. | 0.  | 0.09 | 0.09 |
| ASO | 2J1 | CLAXTON-EVANS COUNTY               | CLAXTON       | 2817.  | 8633.  | 0.  | 0.08 | 0.08 |
| ASO | 18A | FRANKLIN COUNTY                    | CANON         | 1766.  | 5411.  | 0.  | 0.05 | 0.05 |
| ASO | 2J5 | MILLEN                             | MILLEN        | 1966.  | 6024.  | 0.  | 0.06 | 0.05 |
| ASO | 25J | CUTHBERT-RANDOLPH                  | CUTHBERT      | 1790.  | 5484.  | 0.  | 0.05 | 0.05 |
| ASO | 4J1 | BRANTLEY COUNTY                    | NAHANTA       | 1989.  | 6094.  | 0.  | 0.06 | 0.05 |
| ASO | 47A | CHEROKEE COUNTY                    | CANTON        | 1573.  | 4810.  | 0.  | 0.04 | 0.04 |
| ASO | 49A | GILMER COUNTY                      | ELLIJAY       | 1035.  | 3170.  | 0.  | 0.03 | 0.03 |
| ASO | JES | JESUP-WAYNE COUNTY                 | JESUP         | 828.   | 2535.  | 0.  | 0.07 | 0.02 |

|     |     |                                      |                |         |          |       |       |       |
|-----|-----|--------------------------------------|----------------|---------|----------|-------|-------|-------|
| ASO | LOZ | LONDON-CORBIN ARPT-MAGEE FLD         | LONDON         | 313811. | 1363390. | 1320. | 8.20  | 11.14 |
| ASO | FFT | CAPITAL CITY                         | FRANKFORT      | 288060. | 1013889. | 918.  | 9.72  | 8.65  |
| ASO | 126 | HENDERSON CITY-COUNTY                | HENDERSON      | 103273. | 287105.  | 249.  | 1.77* | 2.59* |
| ASO | BWG | BOWLING GREEN-WARREN COUNTY          | BOWLING GREEN  | 144266. | 202625.  | 159.  | 1.76  | 2.30  |
| ASO | 019 | BEN FLOYD FIELD                      | ELIZABETHTOWN  | 197.    | 211288.  | 197.  | 1.62* | 2.17* |
| ASO | 210 | MADISONVILLE MUNI                    | MADISONVILLE   | 122064. | 185268.  | 172.  | 1.50  | 2.04  |
| ASO | GLW | GLASGOW MUNI                         | GLASGOW        | 109391. | 174992.  | 152.  | 1.49  | 1.89  |
| ASO | 016 | TAYLOR COUNTY                        | CAMPBELLSVILLE | 116644. | 149409.  | 136.  | 1.22* | 1.77* |
| ASO | SME | SOMERSET-PULASKI COUNTY              | SOMERSET       | 74300.  | 84109.   | 0.    | 3.65  | 1.02  |
| ASO | 131 | GOODALL FIELD                        | DANVILLE       | 117120. | 36024.   | 0.    | 0.85  | 1.02  |
| ASO | 510 | PIKEVILLE-PIKE COUNTY                | PIKEVILLE      | 96202.  | 44321.   | 0.    | 0.69  | 0.93  |
| ASO | 1A6 | MIDDLESBORO-BELL COUNTY              | MIDDLESBORO    | 88374.  | 24837.   | 0.    | 0.49  | 0.75  |
| ASO | 6M5 | HANCOCK AIRFIELD                     | HAWESVILLE     | 15769.  | 90954.   | 83.   | 0.54* | 0.71* |
| ASO | 137 | HAZARD                               | HAZARD         | 68011.  | 33443.   | 0.    | 0.49  | 0.67  |
| ASO | 128 | ASHLAND-BOYD COUNTY                  | ASHLAND        | 31494.  | 50599.   | 92.   | 0.97  | 0.55  |
| ASO | 1M8 | HOPKINSVILLE-CHRISTIAN COUNTY        | HOPKINSVILLE   | 50540.  | 31076.   | 0.    | 0.42  | 0.54  |
| ASO | BRY | SAMUELS FIELD                        | BARDSTOWN      | 63749.  | 16186.   | 0.    | 0.77  | 0.53  |
| ASO | FGX | FLEMING-MASON                        | FLEMINGSBURG   | 39007.  | 30189.   | 0.    | 1.27  | 0.46  |
| ASO | 013 | MT STERLING-MONTGOMERY COUNTY        | MOUNT STERLING | 43817.  | 17960.   | 0.    | 0.29  | 0.41  |
| ASO | M25 | MAYFIELD GRAVES COUNTY               | MAYFIELD       | 35358.  | 23392.   | 70.   | 0.53  | 0.39  |
| ASO | 4M7 | RUSSELLVILLE-LOGAN COUNTY            | RUSSELLVILLE   | 18952.  | 39851.   | 139.  | 1.06  | 0.39  |
| ASO | 316 | PAINTSVILLE-PRESTONSBURG-COMBS FIELD | PAINTSVILLE    | 12946.  | 34209.   | 0.    | 0.33  | 0.31  |
| ASO | M21 | MUHLENBERG COUNTY                    | GREENVILLE     | 17687.  | 27591.   | 0.    | 0.95  | 0.30  |
| ASO | M34 | KENTUCKY DAM STATE PARK              | GILBERTSVILLE  | 14237.  | 31512.   | 0.    | 0.30  | 0.28  |
| ASO | 018 | CYNTHIANA-HARRISON COUNTY            | CYNTHIANA      | 17775.  | 25467.   | 0.    | 0.21  | 0.26  |
| ASO | BRG | WHITESBURG MUNI                      | WHITESBURG     | 18698.  | 17083.   | 0.    | 0.20  | 0.23  |
| ASO | I35 | TUCKER-GUTHRIE MEMORIAL              | HARLAN         | 9515.   | 17815.   | 83.   | 0.57  | 0.22  |
| ASO | I39 | MADISON                              | RICHMOND       | 12632.  | 24620.   | 0.    | 0.85  | 0.22  |
| ASO | CEY | MURRAY-CALLOWAY COUNTY               | MURRAY         | 9528.   | 20550.   | 0.    | 0.20  | 0.20  |
| ASO | 910 | WAYNE COUNTY                         | MONTICELLO     | 7209.   | 20238.   | 0.    | 0.22  | 0.19  |
| ASO | I05 | STURGIS MUNI                         | STURGIS        | 6817.   | 22083.   | 0.    | 0.22  | 0.18  |
| ASO | I32 | MOREHEAD-ROWAN COUNTY                | MOREHEAD       |         | 20887.   | 0.    |       |       |

|     |      |                               |                      |                        |         |         |      |       |       |
|-----|------|-------------------------------|----------------------|------------------------|---------|---------|------|-------|-------|
| ASO | IM7  | FULTON                        |                      | FULTON                 | 18264.  | 5961.   | 0.   | 0.17  | 0.16  |
| ASO | 150  | STANTON                       |                      | STANTON                | 16996.  | 6178.   | 0.   | 0.16  | 0.15  |
| ASO | 130  | BEREA-RICHMOND                |                      | BEREA                  | 14708.  | 6491.   | 0.   | 0.15  | 0.14  |
| ASO | 2M0  | PRINCETON-CALDWELL COUNTY     |                      | PRINCETON              | 13008.  | 4245.   | 0.   | 0.12  | 0.11  |
| ASO | 133  | MARSHALL FLD                  |                      | GEORGETOWN             | 5550.   | 9431.   | 0.   | 0.03  | 0.10  |
| ASO | 149  | ARNOLDS                       |                      | SPRINGFIELD            | 9426.   | 3077.   | 0.   | 0.09  | 0.08  |
| ASO | 193  | BRECKINRIDGE COUNTY           |                      | HARDINSBURG            | 8111.   | 2647.   | 0.   | 0.03  | 0.07  |
| ASO | 511  | BOSS                          |                      | BURNSIDE               | 6507.   | 2124.   | 0.   | 0.06  | 0.06  |
| ASO | KY07 | BLUE LICK                     |                      | LOUISVILLE             | 2149.   | 702.    | 0.   | 0.02  | 0.02  |
| ASO | MBO  | BRUCE CAMPBELL FIELD          |                      | MADISON                | 802016. | 213337. | 645. | 5.04  | 6.75  |
| ASO | HBG  | HATTIESBURG MUNI              |                      | HATTIESBURG            | 707197. | 126511. | 529. | 4.87  | 5.54  |
| ASO | TUP  | C.D. LEMONS MUNI              |                      | TUPELO                 | 586576. | 206777. | 509. | 4.08  | 5.27  |
| ASO | OLV  | OLIVE BRANCH                  |                      | OLIVE BRANCH           | 588775. | 157627. | 502. | 3.58  | 4.96  |
| ASO | PGL  | JACKSON COUNTY                |                      | PASCAGOULA             | 605588. | 108536. | 514. | 3.57  | 4.74  |
| ASO | HEZ  | HARDY-ANCERS FIELD            | NATCHEZ-ADAMS COUNTY | NATCHEZ                | 407921. | 174117. | 367. | 2.29  | 3.87  |
| ASO | PIB  | PINE BELT REGIONAL            |                      | LAUREL/HATTIESBURG     | 364959. | 164447. | 345. | 2.11  | 3.52  |
| ASO | LUL  | HESLER-NOBLE FIELD            |                      | LAUREL                 | 408045. | 68989.  | 365. | 1.91  | 3.17  |
| ASO | GWO  | GREENWOOD-LEFLORE             |                      | GREENWOOD              | 335159. | 119789. | 303. | 2.31  | 3.02  |
| ASO | VKS  | VICKSBURG MUNI                |                      | VICKSBURG              | 356211. | 61632.  | 316. | 2.10  | 2.78* |
| ASO | RNV  | CLEVELAND MUNI                |                      | CLEVELAND              | 276033. | 48266.  | 241. | 2.10  | 2.15  |
| ASO | MCB  | MCCOMB-PIKE COUNTY            |                      | MC COMB                | 274228. | 47838.  | 254. | 1.44  | 2.14  |
| ASO | CKM  | FLETCHER FIELD                |                      | CLARKSDALE             | 238096. | 42545.  | 203. | 2.01  | 1.86  |
| ASO | 1R7  | BROOKHAVEN-LINCOLN COUNTY     |                      | BROOKHAVEN             | 155283. | 26563.  | 139. | 1.05* | 1.21* |
| ASO | UOX  | UNIVERSITY-OXFORD             |                      | OXFORD                 | 57019.  | 109298. | 0.   | 2.12  | 1.11  |
| ASO | GTR  | GOLDEN TRIANGLE REGIONAL      |                      | COLUMBUS/W POINT/STARK | 45432.  | 120192. | 0.   | 0.92  | 1.10  |
| ASO | CRX  | ROSCOE TURNER                 |                      | CORINTH                | 127576. | 24294.  | 100. | 1.31  | 1.01  |
| ASO | IDL  | INDIANOLA MUNICIPAL           |                      | INDIANOLA              | 125098. | 23219.  | 101. | 0.76  | 0.99  |
| ASO | 5R2  | GULFPARK                      |                      | OCEAN SPRINGS          | 89836.  | 23446.  | 285. | 1.78  | 0.75  |
| ASO | M16  | JOHN BELL WILLIAMS            |                      | RAYMOND                | 70318.  | 13729.  | 60.  | 0.65  | 0.62  |
| ASO | M37  | RULEVILLE-DREW                |                      | DREW                   | 74263.  | 22953.  | 0.   | 0.41* | 0.58* |
| ASO | LMS  | LOUISVILLE WINSTON COUNTY     |                      | LOUISVILLE             | 68326.  | 12681.  | 56.  | 0.68  | 0.54  |
| ASO | 3R6  | STENNIS INTERNATIONAL         |                      | BAY ST LOUIS           | 57734.  | 18842.  | 0.   | 2.40  | 0.51  |
| ASO | PCU  | PICAYUNE PEARL RIVER COUNTY   |                      | PICAYUNE               | 64506.  | 11407.  | 56.  | 0.36* | 0.50* |
| ASO | 2M7  | DESOTO AIRPARK                |                      | HORN LAKE              | 24127.  | 49507.  | 0.   | 0.34  | 0.49  |
| ASO | 2M6  | TWINKLE TOWN                  |                      | WALLS                  | 61732.  | 10770.  | 0.   | 0.10  | 0.48  |
| ASO | OR0  | COLUMBIA-MARION COUNTY        |                      | COLUMBIA               | 52021.  | 16980.  | 0.   | 1.56  | 0.46  |
| ASO | UBS  | COLUMBUS-LOWNDES COUNTY       |                      | COLUMBUS               | 51599.  | 16839.  | 0.   | 0.47  | 0.45  |
| ASO | OSX  | KOSCIUSKO-ATTALA COUNTY       |                      | KOSCIUSKO              | 49709.  | 9226.   | 40.  | 0.49  | 0.39  |
| ASO | STF  | GEORGE M BRYAN                |                      | STARKVILLE             | 43216.  | 14107.  | 0.   | 0.40  | 0.38  |
| ASO | M40  | MONROE COUNTY                 |                      | ABERDEEN/AMORY         | 36667.  | 11966.  | 0.   | 0.34  | 0.32  |
| ASO | M41  | HOLLY SPRINGS-MARSHALL COUNTY |                      | HOLLY SPRINGS          | 40779.  | 7648.   | 33.  | 0.28  | 0.32  |
| ASO | M42  | GRENADA MUNI                  |                      | GRENADA                | 34681.  | 11320.  | 0.   | 0.32  | 0.31  |
| ASO | 22M  | PONTOTOC COUNTY               |                      | PONTOTOC               | 30174.  | 9850.   | 0.   | 0.28  | 0.27  |
| ASO | 20M  | MACON MUNI                    |                      | MACON                  | 30039.  | 9805.   | 0.   | 0.28  | 0.26* |
| ASO | 25M  | RIPLEY                        |                      | RIPLEY                 | 33811.  | 5840.   | 30.  | 0.20* | 0.26* |
| ASO | M23  | OKEEFE FIELD                  |                      | NEWTON                 | 28837.  | 9411.   | 0.   | 0.26  | 0.25  |
| ASO | 1M2  | BELZONI MUNI                  |                      | BELZONI                | 25415.  | 7200.   | 53.  | 0.42  | 0.22  |
| ASO | 14M  | HOLLANDALE MUNI               |                      | HOLLANDALE             | 24407.  | 7967.   | 0.   | 0.23  | 0.22  |
| ASO | M506 | DEAN GRIFFIN MEMORIAL         |                      | WIGGINS                | 23952.  | 7817.   | 0.   | 0.22  | 0.21  |
| ASO | M72  | NEW ALBANY-UNION CO           |                      | NEW ALBANY             | 19796.  | 6460.   | 0.   | 0.18  | 0.17  |
| ASO | M68  | DORR FIELD                    |                      | MERIGOLD               | 14873.  | 4854.   | 0.   | 0.14  | 0.13  |
| ASO | 8M1  | BOONEVILLE-BALDWIN            |                      | BOONEVILLE-BALDWIN     | 13638.  | 4451.   | 0.   | 0.12  | 0.12  |
| ASO | 0M6  | PANOLA COUNTY                 |                      | BATESVILLE             | 12082.  | 3944.   | 0.   | 0.11  | 0.11  |
| ASO | M83  | MCCHAREN FIELD                |                      | WEST POINT             | 10991.  | 3588.   | 0.   | 0.10  | 0.10  |
| ASO | M44  | HOUSTON MUNI                  |                      | HOUSTON                | 11369.  | 3710.   | 0.   | 0.10  | 0.10  |
| ASO | M17  | PHILADELPHIA MUNI             |                      | PHILADELPHIA           | 10991.  | 3588.   | 0.   | 0.10  | 0.10  |
| ASO | 3A8  | STINSON FIELD MUNI            |                      | ABERDEEN               | 11306.  | 3690.   | 0.   | 0.10  | 0.10  |
| ASO | 08M  | CARTHAGE-LEAKE COUNTY         |                      | CARTHAGE               | 8970.   | 2927.   | 0.   | 0.08  | 0.08  |
| ASO | 5A6  | WINONA-MONTGOMERY COUNTY      |                      | WINONA                 | 9092.   | 2967.   | 0.   | 0.08  | 0.08  |

|          |                                 |                |         |         |      |       |       |
|----------|---------------------------------|----------------|---------|---------|------|-------|-------|
| ASO 07M  | HASTING AIRPARK                 | BRUCE          | 9488.   | 3097.   | 0.   | 0.09  | 0.08  |
| ASO M51  | OKTIBBEHA                       | STARKVILLE     | 9520.   | 3107.   | 0.   | 0.09  | 0.08  |
| ASO M504 | PRENTISS-JEFFERSON DAVIS COUNTY | PRENTISS       | 8056.   | 2630.   | 0.   | 0.07  | 0.07  |
| ASO 01M  | TISHOMINGO COUNTY               | BELMONT        | 6444.   | 2103.   | 0.   | 0.06  | 0.06  |
| ASO 2M4  | FOREST MUNI                     | FOREST         | 4544.   | 1483.   | 0.   | 0.04  | 0.04  |
| ASO T36  | TYLERTOWN                       | TYLERTOWN      | 2293.   | 748.    | 0.   | 0.02  | 0.02  |
| ASO 4R1  | I H BASS JR MEMORIAL            | LUMBERTON      | 1516.   | 495.    | 0.   | 0.01  | 0.01  |
| ASO LBT  | LUMBERTON MUNI                  | LUMBERTON      | 651670. | 108557. | 630. | 3.74  | 5.05  |
| ASO MEB  | LAURINBURG-MAXTON               | MAXTON         | 498365. | 190100. | 489. | 3.42  | 4.57  |
| ASO W03  | WILSON MUNI                     | WILSON         | 519175. | 101491. | 477. | 3.29* | 4.12* |
| ASO 0CW  | WARREN FIELD                    | WASHINGTON     | 466840. | 105985. | 419. | 2.83* | 3.81* |
| ASO EQY  | MONROE                          | MONROE         | 376893. | 162498. | 340. | 2.12  | 3.37  |
| ASO RWI  | ROCKY MOUNT-WILSON              | ROCKY MOUNT    | 346352. | 161248. | 340. | 2.12  | 3.37  |
| ASO BUY  | BURLINGTON MUNI                 | BURLINGTON     | 335908. | 94152.  | 271. | 2.22  | 2.86  |
| ASO ECG  | ELIZABETH CITY MUNI             | ELIZABETH CITY | 357893. | 58667.  | 349. | 1.61* | 2.77* |
| ASO 0A6  | GASTONIA MUNI                   | GASTONIA       | 284039. | 129322. | 202. | 1.94* | 2.75* |
| ASO MRH  | BEAUFORT-MOREHEAD CITY          | BEAUFORT       | 343139. | 59979.  | 0.   | 0.61  | 2.68  |
| ASO MRN  | MORGANTON-LENOIR                | MORGANTON      | 231282. | 144233. | 201. | 1.65  | 2.50  |
| ASO RZZ  | HALIFAX COUNTY                  | ROANOKE RAPIDS | 201746. | 142868. | 203. | 2.19  | 2.29  |
| ASO 45J  | ROCKINGHAM-HAMLET               | ROCKINGHAM     | 268658. | 64406.  | 243. | 1.61  | 2.21  |
| ASO EDE  | EDENTON MUNI                    | EDENTON        | 238111. | 70835.  | 220. | 1.60  | 2.05  |
| ASO W77  | SANFORD-LEE COUNTY BRICK FIELD  | SANFORD        | 252071. | 45017.  | 229. | 1.39  | 1.97  |
| ASO ASJ  | TRI-COUNTY                      | SHOSKIE        | 190695. | 80479.  | 176. | 1.42* | 1.80* |
| ASO SOP  | PINEHURST-SOUTHERN PINES        | SOUTHERN PINES | 124787. | 142921. | 2.   | 5.37  | 1.78  |
| ASO W44  | ASHEBORO MUNI                   | ASHEBORO       | 203020. | 35924.  | 181. | 1.16* | 1.59* |
| ASO CTZ  | SAMPSON COUNTY                  | CLINTON        | 111813. | 106067. | 82.  | 1.07  | 1.45  |
| ASO PGV  | PITT-GREENVILLE                 | GREENVILLE     | 73772.  | 129419. | 1.   | 3.44  | 1.35  |
| ASO W52  | HORACE WILLIAMS                 | CHAPEL HILL    | 142918. | 32113.  | 124. | 0.82* | 1.16* |
| ASO 0AU  | ALBERT J ELLIS                  | JACKSONVILLE   | 43252.  | 119480. | 0.   | 0.94  | 1.08  |
| ASO RUQ  | ROMAN COUNTY                    | SALISBURY      | 111282. | 48423.  | 289. | 1.97  | 1.06  |
| ASO GW4  | GOLDSBORO-WAYNE MUNI            | GOLDSBORO      | 63635.  | 80847.  | 0.   | 2.03  | 0.96  |
| ASO 8W5  | BILLY MITCHELL                  | HATTERAS       | 96620.  | 22221.  | 88.  | 0.79* | 0.79* |
| ASO CPC  | COLUMBUS COUNTY MUNICIPAL       | WHITEVILLE     | 41446.  | 73603.  | 0.   | 0.58  | 0.76  |
| ASO 3A3  | ANSON COUNTY                    | WADESBORO      | 21055.  | 90176.  | 0.   | 0.47  | 0.74  |
| ASO SVH  | STATESVILLE MUNI                | STATESVILLE    | 60583.  | 37824.  | 0.   | 1.82  | 0.65  |
| ASO 1A5  | MACON COUNTY                    | FRANKLIN       | 23328.  | 67691.  | 0.   | 0.41  | 0.60  |
| ASO 6A3  | ANDREWS-MURPHY                  | ANDREWS        | 44087.  | 44511.  | 0.   | 0.51  | 0.59  |
| ASO IKB  | WILKES COUNTY                   | WILKESBORO     | 35179.  | 41604.  | 0.   | 0.97  | 0.51  |
| ASO MQI  | MANTEO                          | MANTEO         | 49815.  | 25296.  | 1.   | 1.05  | 0.50  |
| ASO 57A  | RUTHERFORD COUNTY               | RUTHERFORDTON  | 53993.  | 17620.  | 0.   | 2.36  | 0.48  |
| ASO 4W8  | HENDERSON-OXFORD                | OXFORD         | 53101.  | 17332.  | 0.   | 1.74  | 0.47* |
| ASO W46  | ERWIN                           | ERWIN          | 58591.  | 12141.  | 41.  | 0.35* | 0.47* |
| ASO MWK  | MT AIRY-SURRY COUNTY            | MT AIRY        | 37557.  | 27745.  | 0.   | 0.40  | 0.43  |
| ASO 24A  | JACKSON COUNTY                  | SYLVA          | 18331.  | 44698.  | 0.   | 0.29  | 0.42  |
| ASO W27  | JOHNSTON COUNTY                 | SMITHFIELD     | 45217.  | 14761.  | 0.   | 1.02  | 0.40  |
| ASO 0A7  | HENDERSONVILLE-WINKLER          | HENDERSONVILLE | 40795.  | 19405.  | 0.   | 0.41  | 0.40  |
| ASO MCZ  | MARTIN COUNTY                   | WILLIAMSTON    | 20553.  | 36828.  | 0.   | 0.29  | 0.38  |
| ASO 4A8  | ALBEMARLE                       | ALBEMARLE      | 16051.  | 37500.  | 0.   | 0.25  | 0.36  |
| ASO PMZ  | PLYMOUTH MUNICIPAL              | PLYMOUTH       | 35807.  | 11689.  | 0.   | 0.77  | 0.32  |
| ASO SUT  | BRUNSWICK COUNTY                | SOUTHPORT      | 39070.  | 6717.   | 36.  | 0.31* | 0.30* |
| ASO ACZ  | HENDERSON FIELD                 | WALLACE        | 25059.  | 20214.  | 0.   | 0.28  | 0.30  |
| ASO ZEF  | ELKIN MUNI                      | ELKIN          | 28313.  | 9241.   | 0.   | 0.89  | 0.25  |
| ASO DPL  | P. B. RAIFORD                   | KENANSVILLE    | 28790.  | 9397.   | 0.   | 1.07  | 0.25  |
| ASO W40  | MT OLIVE MUNI                   | MT OLIVE       | 21737.  | 13187.  | 0.   | 0.35  | 0.23  |
| ASO W95  | OCRACOKE ISLAND                 | OCRACOKE       | 25026.  | 8167.   | 0.   | 0.24  | 0.22  |
| ASO LFN  | FRANKLIN COUNTY                 | LOUISBURG      | 24539.  | 8011.   | 0.   | 0.23  | 0.22  |
| ASO 43A  | MONTGOMERY COUNTY               | STAR           | 19735.  | 6441.   | 0.   | 0.19  | 0.17  |
| ASO 5W4  | RAEFORD MUNI                    | RAEFORD        | 15473.  | 5051.   | 0.   | 0.25  | 0.14  |
| ASO EXX  | LEXINGTON MUNI                  | LEXINGTON      | 12004.  | 3283.   | 31.  | 0.20  | 0.10  |

|     |      |                              |    |          |         |       |       |       |
|-----|------|------------------------------|----|----------|---------|-------|-------|-------|
| ASO | FFA  | FIRST FLIGHT                 | NC | 6894.    | 8340.   | 0.    | 0.08  | 0.10  |
| ASO | NC16 | HIATT                        | NC | 11398.   | 3721.   | 0.    | 0.11  | 0.10  |
| ASO | 5W8  | SILER CITY MUNI              | NC | 8639.    | 2820.   | 0.    | 0.08  | 0.08  |
| ASO | 6A6  | STANLY COUNTY                | NC | 7437.    | 2427.   | 0.    | 0.07  | 0.07  |
| ASO | 7A8  | AVERY COUNTY/MORRISON FIELD/ | NC | 6715.    | 2191.   | 0.    | 0.06  | 0.06  |
| ASO | NC67 | ASHE COUNTY                  | NC | 5515.    | 1800.   | 0.    | 0.05  | 0.05  |
| ASO | BQN  | BORINQUEN                    | PR | 113053.  | 142269. | 0.    | 1.68  | 1.70  |
| ASO | X63  | HUMACAO                      | PR | 17968.   | 111227. | 0.    | 0.69  | 0.86  |
| ASO | VQS  | VIEQUES                      | PR | 7731.    | 107887. | 0.    | 0.58  | 0.77  |
| ASO | CPX  | CULEBRA /RESTRICTED/         | PR | 7002.    | 105232. | 0.    | 0.52  | 0.75  |
| ASO | ABO  | ARECIBO AIRFIELD             | PR | 18954.   | 6185.   | 0.    | 0.19  | 0.17  |
| ASO | 49J  | HILTON HEAD                  | SC | 942575.  | 264348. | 823.  | 7.25* | 8.02* |
| ASO | GRD  | GREENWOOD COUNTY             | SC | 362261.  | 160295. | 312.  | 2.84  | 3.47  |
| ASO | CEU  | CLEMSON-GOONEE COUNTY        | SC | 373202.  | 137950. | 326.  | 2.31* | 3.40* |
| ASO | CUB  | OWENS FIELD                  | SC | 297272.  | 169969. | 0.    | 2.95  | 3.10  |
| ASO | CDN  | WOODWARD FIELD               | SC | 321520.  | 88852.  | 278.  | 2.35  | 2.73  |
| ASO | BNL  | BARNWELL COUNTY              | SC | 209680.  | 101070. | 175.  | 1.31* | 2.06* |
| ASO | 88J  | ALLENDALE COUNTY             | SC | 217536.  | 81515.  | 161.  | 1.33* | 1.99* |
| ASO | AND  | ANDERSON COUNTY              | SC | 102673.  | 117682. | 0.    | 1.21  | 1.46  |
| ASO | 61J  | J.E. LOCKLAIR MEMORIAL       | SC | 93832.   | 114798. | 0.    | 1.13  | 1.39  |
| ASO | J2I  | JOHNS ISLAND                 | SC | 74605.   | 120703. | 0.    | 2.68  | 1.30  |
| ASO | 29J  | BRYANT FIELD                 | SC | 104275.  | 85511.  | 0.    | 2.57  | 1.26  |
| ASO | SMS  | SUMTER MUNI                  | SC | 91919.   | 93226.  | 0.    | 1.02  | 1.23  |
| ASO | RBW  | WALTERBORO MUNI              | SC | 144779.  | 32449.  | 122.  | 1.04  | 1.18  |
| ASO | MAO  | MARION COUNTY                | SC | 143868.  | 29686.  | 126.  | 0.92  | 1.15  |
| ASO | 27J  | NEWBERRY MUNI                | SC | 136679.  | 24061.  | 118.  | 0.77* | 1.07* |
| ASO | 50J  | BERKELEY COUNTY              | SC | 33039.   | 116147. | 0.    | 0.81  | 0.99  |
| ASO | 04J  | DARLINGTON MUNI              | SC | 113418.  | 33681.  | 110.  | 0.64* | 0.98* |
| ASO | 9A6  | CHESTER COUNTY               | SC | 115086.  | 27925.  | 70.   | 0.75  | 0.95  |
| ASO | HVS  | HARTSVILLE MUNI              | SC | 94943.   | 19023.  | 69.   | 0.77  | 0.76  |
| ASO | 47J  | CHERAW MUNI                  | SC | 76594.   | 32241.  | 51.   | 0.52  | 0.72  |
| ASO | FDW  | FAIRFIELD COUNTY             | SC | 58600.   | 37527.  | 48.   | 0.44* | 0.64* |
| ASO | AIK  | AIKEN MUNI                   | SC | 34765.   | 56477.  | 0.    | 0.45  | 0.61  |
| ASO | LQK  | PICKENS COUNTY               | SC | 64410.   | 24277.  | 0.    | 1.70  | 0.59  |
| ASO | HYW  | CONWAY-HORRY COUNTY          | SC | 52364.   | 36441.  | 0.    | 1.26  | 0.59  |
| ASO | GGE  | GEORGETOWN COUNTY            | SC | 19137.   | 63837.  | 0.    | 0.33  | 0.55  |
| ASO | 0GB  | ORANGEBURG                   | SC | 49186.   | 18345.  | 0.    | 1.24  | 0.45  |
| ASO | 58J  | HUGGINS                      | SC | 42788.   | 8229.   | 33.   | 0.24* | 0.34* |
| ASO | 35A  | UNION COUNTY                 | SC | 12168.   | 36153.  | 0.    | 0.20  | 0.32  |
| ASO | CKI  | WILLIAMSBURG COUNTY          | SC | 35488.   | 11583.  | 0.    | 1.08  | 0.31  |
| ASO | DLC  | DILLON COUNTY                | SC | 30798.   | 10052.  | 0.    | 0.28  | 0.27  |
| ASO | 73J  | BEAUFORT COUNTY              | SC | 9183.    | 30089.  | 0.    | 0.16  | 0.26  |
| ASO | 34A  | LAURENS COUNTY               | SC | 20883.   | 13276.  | 0.    | 0.21  | 0.23  |
| ASO | LKR  | LANCASTER COUNTY             | SC | 19702.   | 6432.   | 0.    | 0.43  | 0.17  |
| ASO | B8P  | MARLBORO COUNTY              | SC | 12836.   | 6994.   | 0.    | 0.12  | 0.13  |
| ASO | 5J9  | TWIN CITY                    | SC | 12375.   | 4040.   | 0.    | 0.24  | 0.11  |
| ASO | 3J1  | RIDGELAND MUNI               | SC | 11353.   | 3706.   | 0.    | 0.11  | 0.10  |
| ASO | 35J  | PAGELAND                     | SC | 4752.    | 1551.   | 0.    | 0.04  | 0.04  |
| ASO | 52J  | BISHOPVILLE MUNI             | SC | 1641.    | 824.    | 0.    | 0.02  | 0.02  |
| ASO | CSV  | CROSSVILLE MEMORIAL          | TN | 1270273. | 226335. | 1230. | 7.66  | 9.94  |
| ASO | MKL  | MCKELLAR FIELD               | TN | 534892.  | 195652. | 499.  | 3.58  | 4.85  |
| ASO | SYI  | BOMAR FLD-SHELBYVILLE MUNI   | TN | 506581.  | 104907. | 468.  | 3.38  | 4.06  |
| ASO | THA  | WILLIAM NORTHERN FIELD       | TN | 364592.  | 71800.  | 320.  | 2.64  | 3.03  |
| ASO | MOR  | MOORE-MURRELL                | TN | 277516.  | 73473.  | 173.  | 6.35  | 2.33  |
| ASO | CKV  | OUTLAW FIELD                 | TN | 109558.  | 141123. | 0.    | 1.55  | 1.67  |
| ASO | SRB  | SPARTA-WHITE COUNTY          | TN | 126698.  | 83059.  | 106.  | 1.08  | 1.39  |
| ASO | PHT  | HENRY COUNTY                 | TN | 69480.   | 127998. | 2.    | 3.38  | 1.31  |

| ASO | 2M8 | CHARLES W. BAKER            | MILLINGTON           | 119803. | 68883.  | 0.   | 1.23  | 1.25  |
|-----|-----|-----------------------------|----------------------|---------|---------|------|-------|-------|
| ASO | GCB | GREENEVILLE MUNI            | GREENEVILLE          | 74466.  | 107117. | 1.   | 3.17  | 1.21  |
| ASO | UCY | EVERETT-STEWART             | UNION CITY           | 72060.  | 106703. | 0.   | 2.23  | 1.19  |
| ASO | TGC | GIBSON COUNTY               | TRENTON              | 134205. | 24250.  | 117. | 1.03  | 1.05  |
| ASO | JAG | SEVIER-GATLINBURG           | SEVIERVILLE          | 61679.  | 90475.  | 0.   | 2.77  | 1.01  |
| ASO | GHM | CENTERVILLE MUNI            | CENTERVILLE          | 55839.  | 93356.  | 48.  | 0.64  | 0.99  |
| ASO | M52 | FRANKLIN WILKINS            | LEXINGTON            | 121474. | 21358.  | 109. | 0.84  | 0.95  |
| ASO | 0A9 | ELIZABETHTON MUNI           | ELIZABETHTON         | 78766.  | 55495.  | 0.   | 0.85  | 0.89  |
| ASO | 0A7 | MURFREESBORO MUNI           | MURFREESBORO         | 98429.  | 32134.  | 0.   | 1.56  | 0.87  |
| ASO | DBT | DYERSBURG MUNI              | DYERSBURG            | 53193.  | 76289.  | 0.   | 1.92  | 0.86  |
| ASO | M01 | GENERAL DEWITT SPAIN        | MEMPHIS              | 89115.  | 29757.  | 0.   | 0.85  | 0.79  |
| ASO | M88 | CORNELIA FORT AIRPARK       | NASHVILLE            | 89137.  | 29099.  | 0.   | 0.86  | 0.79  |
| ASO | HDI | HARDWICK FIELD              | CLEVELAND            | 68531.  | 49483.  | 0.   | 1.97  | 0.78  |
| ASO | M54 | LEBANON MUNI                | LEBANON              | 39085.  | 75164.  | 0.   | 1.58  | 0.76  |
| ASO | 0M4 | BENTON COUNTY               | CAMDEN               | 23098.  | 90720.  | 0.   | 1.11  | 0.76  |
| ASO | CJE | PUTNAM COUNTY               | COOKEVILLE           | 48984.  | 63579.  | 0.   | 1.26  | 0.75  |
| ASO | SNH | SAVANNAH-HARDIN COUNTY      | SAVANNAH             | 34949.  | 70913.  | 0.   | 1.38  | 0.70  |
| ASO | 0M5 | HUMPHREYS COUNTY            | WAVENLY              | 24872.  | 78464.  | 0.   | 0.87  | 0.69  |
| ASO | MRC | MAURY COUNTY                | COLUMBIA/MT PLEASANT | 45382.  | 50562.  | 0.   | 1.54  | 0.64  |
| ASO | 1M5 | PORTLAND MUNICIPAL          | PORTLAND             | 36424.  | 59477.  | 0.   | 1.32  | 0.64  |
| ASO | M33 | GALLATIN MUNI               | GALLATIN             | 34631.  | 58893.  | 0.   | 0.98  | 0.62  |
| ASO | SZY | ROBERT SIBLEY               | SELMER               | 25826.  | 67935.  | 0.   | 1.16  | 0.62  |
| ASO | MMI | MCMINN COUNTY               | ATHENS               | 51106.  | 40417.  | 0.   | 2.01  | 0.61  |
| ASO | RNC | WARREN COUNTY MEMORIAL      | MCMINNVILLE          | 36252.  | 54677.  | 0.   | 1.23  | 0.60  |
| ASO | 2A0 | MARK ANTON                  | DAYTON               | 33762.  | 52676.  | 0.   | 1.31  | 0.57  |
| ASO | M08 | BOLIVAR-HARDEMAN COUNTY     | BOLIVAR              | 55782.  | 24128.  | 0.   | 0.55  | 0.53  |
| ASO | LHC | ARLINGTON MUNI              | ARLINGTON            | 53347.  | 23338.  | 0.   | 1.08  | 0.51  |
| ASO | M04 | COVINGTON MUNI              | COVINGTON            | 31514.  | 18543.  | 0.   | 1.53  | 0.50  |
| ASO | BGF | WINCHESTER MUNI             | WINCHESTER           | 31514.  | 40068.  | 0.   | 1.39  | 0.48  |
| ASO | FYM | FAYETTEVILLE MUNI           | FAYETTEVILLE         | 36759.  | 29820.  | 0.   | 0.98  | 0.41  |
| ASO | JAU | CAMPBELL COUNTY             | JACKSBORO            | 32988.  | 28590.  | 0.   | 0.40  | 0.41  |
| ASO | M91 | SPRINGFIELD MUNI            | SPRINGFIELD          | 38448.  | 22977.  | 0.   | 1.27  | 0.39  |
| ASO | RKW | ROCKWOOD MUNI               | ROCKWOOD             | 30272.  | 27702.  | 0.   | 1.35  | 0.36  |
| ASO | M53 | HUMBOLDT MUNI               | HUMBOLDT             | 35925.  | 17586.  | 3.   | 0.64  | 0.35  |
| ASO | APT | MARION COUNTY-BROWN FLD     | JASPER               | 18962.  | 33007.  | 0.   | 0.96  | 0.34  |
| ASO | LUG | ELLINGTON                   | LEWISBURG            | 29464.  | 21456.  | 0.   | 0.78  | 0.32  |
| ASO | RVN | HAWKINS COUNTY              | ROGERSVILLE          | 25046.  | 23012.  | 0.   | 0.28  | 0.26  |
| ASO | MNV | MONROE COUNTY               | MADISONVILLE         | 29181.  | 9524.   | 0.   | 0.27  | 0.25  |
| ASO | 0M1 | SCOTT FIELD                 | PARSONS              | 28776.  | 9391.   | 24.  | 0.16* | 0.22* |
| ASO | M29 | HASSELL FIELD               | CLIFTON              | 27556.  | 5025.   | 0.   | 0.22  | 0.21  |
| ASO | 8A3 | LIVINGSTON MUNI             | LIVINGSTON           | 23396.  | 7636.   | 0.   | 0.58  | 0.19  |
| ASO | M02 | DICKSON MUNI                | DICKSON              | 20734.  | 8548.   | 0.   | 0.19  | 0.17  |
| ASO | 3A2 | TAZEWELL'S-CLAIBORNE COUNTY | TAZEWELL             | 19788.  | 6458.   | 0.   | 0.18  | 0.17  |
| ASO | GZ5 | ABERNATHY FIELD             | PULASKI              | 19834.  | 6473.   | 0.   | 0.17  | 0.16  |
| ASO | 2M2 | LAWRENCEBURG MUNI           | LAWRENCEBURG         | 18669.  | 7613.   | 0.   | 0.14  | 0.16  |
| ASO | 2A1 | JAMESTOWN MUNI              | JAMESTOWN            | 17944.  | 5857.   | 0.   | 0.16  | 0.15  |
| ASO | 1A3 | MARTIN CAMPBELL FIELD       | COPPERHILL           | 12911.  | 10788.  | 0.   | 0.11  | 0.14  |
| ASO | 3M7 | LAFAYETTE MUNICIPAL         | LAFAYETTE            | 16770.  | 5474.   | 0.   | 0.13  | 0.12  |
| ASO | U05 | FRANKLIN COUNTY             | SEWANEE              | 7505.   | 14289.  | 0.   | 0.08  | 0.08  |
| ASO | 6A4 | JOHNSON COUNTY              | MOUNTAIN CITY        | 13524.  | 5250.   | 0.   | 0.02  | 0.02  |
| ASO | 0M2 | REELFOOT LAKE               | TIPTONVILLE          | 8914.   | 3194.   | 0.   | 0.00  | 0.00  |
| ASO | 1A7 | JACKSON COUNTY              | GAINESBORO           | 1958.   | 639.    | 0.   | 0.00  | 0.00  |
| ASO | SCX | SCOTT MUNI                  | ONEIDA               | 162.    | 49.     | 0.   | 0.00  | 0.00  |

SOUTHWEST REGION

ASW JBR JONESBORO MUNI  
ASW IM1 NORTH LITTLE ROCK MUNI

JONESBORO  
NORTH LITTLE ROCK

AR AR  
1656932. 386449. 1420. 10.81 13.58  
730429. 161124. 621. 4.57 5.92

| ASW     | ARG | WALNUT RIDGE REGIONAL         | WALNUT RIDGE       | 596366.  | 181540. | 531.  | 4.02  | 5.17  |
|---------|-----|-------------------------------|--------------------|----------|---------|-------|-------|-------|
| ASW H37 | FLP | SPRINGDALE MUNI               | FLIPPING           | 535617.  | 216444. | 363.  | 8.33  | 5.00  |
| ASW M39 | FLP | MARION COUNTY REGIONAL        | MENA               | 551246.  | 200482. | 479.  | 3.50* | 4.99* |
| ASW H00 | M39 | MENA MUNICIPAL                | BENTONVILLE        | 439545.  | 179402. | 384.  | 3.53* | 4.11* |
| ASW M09 | H00 | BENTONVILLE MUN               | MOUNTAIN HOME      | 334906.  | 163552. | 288.  | 2.27* | 3.31* |
| ASW M07 | M09 | MOUNTAIN HOME MUNI            | SEARCY             | 317669.  | 159707. | 277.  | 2.20* | 3.17* |
| ASW H02 | M07 | SEARCY MUNI                   | HEBER SPRINGS      | 313710.  | 153082. | 277.  | 2.25* | 3.10* |
| ASW H02 | H02 | HEBER SPRINGS MUNI            | PARAGOULD          | 358907.  | 62347.  | 313.  | 2.05* | 2.80* |
| ASW PGR | PGR | PARAGOULD MUNI                | CAMDEN             | 238937.  | 128297. | 186.  | 2.65  | 2.44  |
| ASW CGH | CGH | HARRELL FIELD                 | CAMDEN             | 190788.  | 116789. | 161.  | 1.75  | 2.04  |
| ASW SGT | SGT | STUTTGART MUNI                | STUTTGART          | 241684.  | 48061.  | 194.  | 1.42  | 1.93  |
| ASW M06 | M06 | RUSSELLVILLE MUNI             | RUSSELLVILLE       | 167971.  | 98940.  | 165.  | 1.23* | 1.91* |
| ASW M76 | M76 | MONTECELLO MUNICIPAL          | MONTECELLO         | 231777.  | 47951.  | 197.  | 1.29* | 1.86* |
| ASW M03 | M03 | CONWAY MUNI                   | CONWAY             | 209028.  | 41434.  | 185.  | 1.31* | 1.66* |
| ASW HKA | HKA | BLYTHEVILLE MUNI              | BLYTHEVILLE        | 99668.   | 121596. | 0.    | 1.21  | 1.47  |
| ASW M18 | M18 | HOPE MUNICIPAL                | HOPE               | 139599.  | 73848.  | 122.  | 1.08  | 1.42  |
| ASW SLG | SLG | SMITH FIELD                   | SILGAM SPRINGS     | 108424.  | 99271.  | 90.   | 0.82* | 1.38* |
| ASW M32 | M32 | LAKE VILLAGE MUNI             | LAKE VILLAGE       | 160274.  | 43105.  | 142.  | 1.01* | 1.35* |
| ASW BVX | BVX | BATESVILLE REGIONAL           | BATESVILLE         | 146317.  | 56433.  | 122.  | 1.22  | 1.35  |
| ASW ELD | ELD | GOODWIN FIELD                 | EL DORADO          | 130400.  | 66698.  | 105.  | 0.78  | 1.31  |
| ASW M19 | M19 | NEWPORT MUNI                  | NEWPORT            | 120619.  | 56051.  | 101.  | 1.07  | 1.17  |
| ASW M89 | M89 | ARKADELPHIA MUNI              | ARKADELPHIA        | 101613.  | 70771.  | 0.    | 1.04  | 1.15  |
| ASW 7M1 | 7M1 | MCGEHEE MUNI                  | MCGEHEE            | 70596.   | 102839. | 50.   | 0.72* | 1.15* |
| ASW M73 | M73 | ALMYRA MUNI                   | ALMYRA             | 123649.  | 46888.  | 106.  | 0.74* | 1.13* |
| ASW M99 | M99 | SALINE COUNTY                 | BENTON             | 120189.  | 46735.  | 102.  | 0.74* | 1.11* |
| ASW H35 | H35 | CLARKSVILLE MUNI              | CLARKSVILLE        | 43733.   | 113633. | 34.   | 0.74* | 1.05* |
| ASW 4M3 | 4M3 | CARLISLE MUNI                 | CARLISLE           | 74226.   | 76791.  | 0.    | 0.82  | 1.00  |
| ASW HRO | HRO | BOONE COUNTY                  | HARRISON           | 32125.   | 115848. | 0.    | 1.79  | 0.98  |
| ASW M70 | M70 | POCAHONTAS MUNI               | POCAHONTAS         | 102979.  | 43156.  | 89.   | 0.67  | 0.97  |
| ASW F90 | F90 | SEVIER COUNTY                 | DEQUEEN            | 105582.  | 37374.  | 91.   | 0.66  | 0.95  |
| ASW F43 | F43 | DOWNTOWN                      | EL DORADO          | 43318.   | 97362.  | 0.    | 0.66  | 0.93  |
| ASW CRT | CRT | CROSSETT MUNI                 | CROSSETT           | 107699.  | 32161.  | 88.   | 0.68  | 0.93  |
| ASW HEE | HEE | THOMPSON-ROBBINS              | HELENA/WEST HELENA | 50009.   | 88897.  | 0.    | 1.28  | 0.92  |
| ASW ROG | ROG | ROGERS MUNI ARPT-CARTER FLD   | ROGERS             | 48035.   | 87317.  | 2.    | 1.80  | 0.90  |
| ASW M39 | M39 | WARREN MUNICIPAL              | WARREN             | 68179.   | 16923.  | 59.   | 0.40* | 0.57* |
| ASW FCY | FCY | FORREST CITY MUNI             | FORREST CITY       | 58853.   | 23276.  | 0.    | 0.22  | 0.55  |
| ASW 7M5 | 7M5 | OZARK-FRANKLIN COUNTY         | OZARK              | 35425.   | 39679.  | 0.    | 1.08  | 0.50  |
| ASW 4M1 | 4M1 | CARROLL COUNTY                | BERRYVILLE         | 18869.   | 53138.  | 0.    | 0.30  | 0.48  |
| ASW AGO | AGO | MAGNOLIA MUNI                 | MAGNOLIA           | 15399.   | 50093.  | 0.    | 0.57  | 0.44  |
| ASW M78 | M78 | MALVERN MUNICIPAL             | MALVERN            | 35166.   | 17804.  | 0.    | 0.34  | 0.35  |
| ASW M36 | M36 | FRANK FEDERER MEMORIAL        | BRINKLEY           | 28005.   | 24816.  | 0.    | 0.30  | 0.35  |
| ASW 4M9 | 4M9 | CORNING MUNI                  | CORNING            | 25391.   | 25156.  | 0.    | 0.29  | 0.34  |
| ASW MXA | MXA | MANILA MUNI                   | MANILA             | 22154.   | 21294.  | 0.    | 0.25  | 0.29  |
| ASW 7M4 | 7M4 | OSCEOLA MUNI                  | OSCEOLA            | 25391.   | 14614.  | 0.    | 0.25  | 0.27  |
| ASW CVK | CVK | CHEROKEE VILLAGE              | CHEROKEE VILLAGE   | 21776.   | 17116.  | 14.   | 0.42  | 0.26  |
| ASW 7M2 | 7M2 | HARRY E WILCOX MEMORIAL FIELD | MOUNTAIN VIEW      | 18370.   | 12323.  | 0.    | 0.19  | 0.20  |
| ASW 6M8 | 6M8 | MARKED TREE MUNI              | MARKED TREE        | 15932.   | 10823.  | 0.    | 0.16  | 0.18  |
| ASW 4M4 | 4M4 | CLINTON MUNI                  | CLINTON            | 14537.   | 11627.  | 0.    | 0.15  | 0.17  |
| ASW M77 | M77 | HOWARD COUNTY                 | NASHVILLE          | 18548.   | 6093.   | 0.    | 0.17  | 0.16  |
| ASW M65 | M65 | WYNNE MUNI                    | WYNNE              | 12223.   | 10280.  | 0.    | 0.13  | 0.15  |
| ASW 5M1 | 5M1 | DE WITT MUNI                  | DE WITT            | 16430.   | 5363.   | 0.    | 0.15  | 0.14  |
| ASW M27 | M27 | WALDRON MUNI                  | WALDRON            | 14537.   | 4745.   | 0.    | 0.13  | 0.13  |
| ASW MPJ | MPJ | PETIT JEAN PARK               | MORRILTON          | 13383.   | 4368.   | 0.    | 0.54  | 0.12  |
| ASW 5M4 | 5M4 | FORDYCE MUNI                  | FORDYCE            | 12073.   | 3941.   | 0.    | 0.11  | 0.11  |
| ASW 6M7 | 6M7 | LEE COUNTY-MARIANNA           | MARIANNA           | 12073.   | 3941.   | 0.    | 0.11  | 0.11  |
| ASW 5M5 | 5M5 | CRYSTAL LAKE                  | DECATUR            | 7966.    | 2600.   | 0.    | 0.25  | 0.07  |
| ASW HUM | HUM | HOUMA-TERREBONNE              | HOUMA              | 1574430. | 391109. | 1360. | 17.26 | 13.06 |
| ASW RSN | RSN | RUSTON MUNI                   | RUSTON             | 685919.  | 187233. | 635.  | 3.93  | 5.80  |
| ASW OR9 | OR9 | HAMMOND MUNI                  | HAMMOND            | 444350.  | 79052.  | 425.  | 2.96* | 3.48* |

|          |                                 |        |        |     |       |       |
|----------|---------------------------------|--------|--------|-----|-------|-------|
| ASW 6R0  | SLIDELL                         | 376435 | 65613  | 354 | 2.29* | 2.94* |
| ASW 6R1  | WELSH                           | 254105 | 43796  | 242 | 1.29  | 1.98  |
| ASW 0R3  | ABBEVILLE                       | 241798 | 53090  | 224 | 1.47* | 1.96* |
| ASW PTL  | HARRY P WILLIAMS MEMORIAL       | 143464 | 142739 | 459 | 4.35  | 1.90  |
| ASW OPL  | ST LANDRY PARISH                | 228136 | 39765  | 214 | 1.39* | 1.78* |
| ASW ARA  | ACADIANA REGIONAL               | 130153 | 108754 | 339 | 2.71  | 1.59  |
| ASW LA37 | THIBODAUX MUNI                  | 176791 | 30815  | 166 | 1.08* | 1.38* |
| ASW 5R8  | DE QUINCY INDUSTRIAL AIRPARK    | 136880 | 23858  | 129 | 0.83* | 1.07* |
| ASW DRI  | BEAUREGARD PARISH               | 136350 | 23590  | 138 | 0.80  | 1.06  |
| ASW 4R0  | MCFILLIN AIR PARK               | 132304 | 23068  | 123 | 0.79* | 1.03* |
| ASW 3R4  | HART                            | 77196  | 13198  | 74  | 0.61  | 0.60  |
| ASW 3R8  | NATCHITOCHES MUNI               | 59323  | 23428  | 171 | 1.64  | 0.55  |
| ASW 3R2  | LE GROS MEMORIAL                | 69039  | 14395  | 50  | 0.43* | 0.55* |
| ASW 3F4  | VIVIAN                          | 26477  | 51881  | 0   | 0.40  | 0.52  |
| ASW LA23 | LEEVILLE                        | 49474  | 16153  | 0   | 0.49  | 0.44  |
| ASW LA96 | OAKLAND                         | 44892  | 14652  | 0   | 0.50  | 0.40  |
| ASW M79  | RAYVILLE MUNI                   | 46677  | 11023  | 26  | 0.33* | 0.38* |
| ASW 2F8  | MOREHOUSE MEMORIAL              | 40139  | 13101  | 0   | 1.30  | 0.35  |
| ASW BXA  | GEORGE R CARR MEMORIAL AIR FLD  | 32983  | 10766  | 0   | 0.32  | 0.29  |
| ASW LA08 | RICHARD PRIVETTE SR             | 26134  | 8530   | 0   | 0.26  | 0.23  |
| ASW 3R7  | JENNINGS                        | 26015  | 8492   | 0   | 0.68  | 0.23  |
| ASW 0M8  | BYERLEY                         | 22308  | 7283   | 0   | 0.22  | 0.20  |
| ASW 0R4  | CONCORDIA PARISH                | 22530  | 7354   | 0   | 0.22  | 0.20  |
| ASW LA18 | JONESVILLE                      | 22101  | 7215   | 0   | 0.22  | 0.19  |
| ASW 9LA6 | PINEVILLE MUNICIPAL             | 20059  | 6547   | 0   | 0.19  | 0.18  |
| ASW 4R5  | EAST LAKE CHARLES               | 18310  | 5977   | 0   | 0.18  | 0.16  |
| ASW F87  | FARMERVILLE                     | 16380  | 4243   | 54  | 0.35  | 0.14  |
| ASW 9M6  | KELLY                           | 15505  | 5061   | 0   | 0.15  | 0.14  |
| ASW 4R7  | EUNICE                          | 15679  | 5118   | 0   | 0.52  | 0.14  |
| ASW 2R1  | JEANERETTE                      | 15335  | 5006   | 0   | 0.15  | 0.14  |
| ASW 3F3  | DESOTO PARISH                   | 14218  | 4641   | 0   | 0.14  | 0.13  |
| ASW SPH  | SPRINGHILL                      | 14287  | 4663   | 0   | 0.14  | 0.13  |
| ASW 0R5  | DAVID G JOYCE                   | 14634  | 4777   | 0   | 0.14  | 0.13  |
| ASW 0M9  | DELHI MUNI                      | 13856  | 4523   | 0   | 0.13  | 0.12  |
| ASW F24  | MINDEN-WEBSTER                  | 12081  | 3943   | 0   | 0.12  | 0.11  |
| ASW F88  | JONESBORO                       | 11726  | 3076   | 37  | 0.23  | 0.10  |
| ASW M80  | SCOTT                           | 10455  | 3412   | 0   | 0.10  | 0.09  |
| ASW 2R3  | WESTWEGO ARPT INC               | 10454  | 3412   | 0   | 0.10  | 0.09  |
| ASW F89  | WINNSBORO MUNI                  | 9294   | 3034   | 0   | 0.09  | 0.08  |
| ASW 2R7  | FRANKLINTON                     | 8446   | 2757   | 0   | 0.08  | 0.07  |
| ASW 1R1  | JENA                            | 5317   | 1735   | 0   | 0.05  | 0.05  |
| ASW ALM  | ALAMOGORDO-WHITE SANDS REGIONAL | 608483 | 198397 | 574 | 1.58* | 5.36* |
| ASW LRU  | LAS CRUCES-CRAWFORD             | 582285 | 198175 | 560 | 3.97* | 5.19* |
| ASW 4AC  | CORNADO                         | 379985 | 229390 | 0   | 4.33  | 4.05  |
| ASW Q64  | ALAMEDA                         | 217470 | 92235  | 0   | 2.26  | 2.06  |
| ASW TCC  | TUCUMCARI MUNI                  | 233029 | 47793  | 205 | 2.27  | 1.87  |
| ASW CNM  | CAVERN CITY AIR TRML            | 134964 | 123317 | 82  | 1.50  | 1.72  |
| ASW GUP  | SENATOR CLARKE FIELD            | 109465 | 133324 | 48  | 3.72  | 1.61  |
| ASW CVN  | CLOVIS MUNI                     | 100103 | 130116 | 2   | 4.45  | 1.53  |
| ASW RUI  | RUIDOSO MUNI                    | 78355  | 130932 | 0   | 1.29  | 1.39  |
| ASW LAM  | LOS ALAMOS                      | 37067  | 117460 | 0   | 0.86  | 1.03  |
| ASW Q34  | PORTALES MUNI                   | 131726 | 23299  | 124 | 0.80* | 1.03* |
| ASW LVS  | LAS VEGAS MUN                   | 43637  | 88141  | 17  | 1.55  | 0.88  |
| ASW 5V5  | SILVER CITY & GRANT CO          | 16241  | 109690 | 1   | 1.01  | 0.65  |
| ASW DMN  | DEMING MUNI                     | 64938  | 32948  | 27  | 1.76  | 0.65  |
| ASW SKX  | TAOS MUNI                       | 45241  | 33088  | 142 | 0.93  | 0.52  |
| ASW RTN  | CREWS FLD                       | 41541  | 8408   | 33  | 0.51  | 0.33  |
| ASW ONM  | SOCORRO MUNI                    | 27491  | 14282  | 0   | 0.87  | 0.28  |
| ASW ATS  | ARTESIA MUN                     | 30704  | 10006  | 17  | 0.60  | 0.27  |

| ASW | E06  | LEA COUNTY-LOVINGTON       | NM | 30925.  | 10093.  | 0.   | 0.31  | 0.27  |
|-----|------|----------------------------|----|---------|---------|------|-------|-------|
| ASW | GNT  | GRANTS-MILAN MUNI          | NM | 20081.  | 17131.  | 0.   | 0.24  | 0.25  |
| ASW | E98  | MID VALLEY AIRPARK         | NM | 7109.   | 18265.  | 0.   | 0.13  | 0.17  |
| ASW | TCS  | TRUTH OR CONSEQUENCES MUNI | NM | 14762.  | 4818.   | 0.   | 0.48  | 0.13  |
| ASW | 5V5  | SHIPROCK AIRSTRIP          | NM | 14131.  | 4611.   | 0.   | 0.14  | 0.12  |
| ASW | 1E6  | TURNER RIDGEPORT           | NM | 993.    | 17509.  | 0.   | 0.07  | 0.12  |
| ASW | Q14  | ESPANOLA MUNI              | NM | 14156.  | 4621.   | 0.   | 0.14  | 0.12  |
| ASW | Q19  | AZTEC MUNI                 | NM | 12365.  | 4036.   | 0.   | 0.12  | 0.11  |
| ASW | E26  | LEA COUNTY/JAL/            | NM | 11709.  | 3822.   | 0.   | 0.12  | 0.10  |
| ASW | 0E0  | MORIARTY                   | NM | 8782.   | 2367.   | 0.   | 0.09  | 0.03  |
| ASW | E91  | ANGEL FIRE                 | NM | 0.      | 10501.  | 0.   | 0.04  | 0.07  |
| ASW | LSB  | LORDSBURG MUNI             | NM | 7487.   | 2444.   | 0.   | 0.08  | 0.07  |
| ASW | Q16  | RESERVE                    | NM | 1444.   | 3348.   | 0.   | 0.02  | 0.03  |
| ASW | Q58  | SANTA ROSA MUNICIPAL       | NM | 3641.   | 1189.   | 0.   | 0.04  | 0.03  |
| ASW | FSU  | FORT SUMNER MUNI           | NM | 2952.   | 964.    | 0.   | 0.03  | 0.03  |
| ASW | Q37  | CARRIZO MUNI               | NM | 2166.   | 707.    | 0.   | 0.02  | 0.02  |
| ASW | Q42  | SPRINGER MUNI              | NM | 632.    | 206.    | 0.   | 0.01  | 0.01  |
| ASW | E89  | CONCHAS STATE PARK         | NM | 820.    | 268.    | 0.   | 0.01  | 0.01  |
| ASW | NM01 | DULCE                      | NM | 820.    | 268.    | 0.   | 0.01  | 0.01  |
| ASW | 66E  | FORT STANTON               | NM | 61.     | 20.     | 0.   | 0.00  | 0.00  |
| ASW | SWO  | STILLWATER MUNI            | OK | 841270. | 253133. | 790. | 6.07  | 7.27  |
| ASW | DUC  | HALLIBURTON FIELD          | OK | 494585. | 190931. | 519. | 3.45  | 4.55  |
| ASW | GUY  | GUYMON MUNI                | OK | 534405. | 117037. | 441. | 5.58  | 4.33  |
| ASW | OUN  | MAX WESTHEIMER             | OK | 376704. | 225811. | 6.   | 13.71 | 4.00  |
| ASW | SNL  | SHAWNEE MUNI               | OK | 379336. | 176775. | 319. | 4.41  | 3.69  |
| ASW | ADH  | ADA MUNI                   | OK | 379163. | 164155. | 388. | 2.91* | 3.61* |
| ASW | F29  | CLARENCE E PAGE MUNI       | OK | 456752. | 85566.  | 434. | 2.90* | 3.60* |
| ASW | GOK  | GUTHRIE MUNI               | OK | 436002. | 100385. | 341. | 3.26  | 3.56  |
| ASW | AXS  | ALTUS MUNI                 | OK | 366826. | 131815. | 326. | 2.32* | 3.16* |
| ASW | MKO  | DAVIS FIELD                | OK | 345286. | 130090. | 311. | 3.60  | 3.16  |
| ASW | BVO  | FRANK PHILLIPS             | OK | 290883. | 157492. | 262. | 3.07  | 2.98  |
| ASW | OKM  | OKMULGEE MUNI.             | OK | 313241. | 75701.  | 209. | 2.12* | 2.53* |
| ASW | 1H6  | HARVEY YOUNG               | OK | 263182. | 85902.  | 0.   | 2.60  | 2.32  |
| ASW | H45  | SEMINOLE MUNI              | OK | 262920. | 58739.  | 250. | 1.68* | 2.14* |
| ASW | FDR  | FREDERICK MUNI             | OK | 226642. | 85017.  | 0.   | 2.59  | 2.07  |
| ASW | CUH  | CUSHING MUNI               | OK | 259255. | 48799.  | 229. | 3.14  | 2.05  |
| ASW | PNC  | PONCA CITY MUNI            | OK | 123908. | 145637. | 2.   | 6.28  | 1.79  |
| ASW | 3K1  | ALVA MUNI                  | OK | 213132. | 54207.  | 198. | 1.42  | 1.78  |
| ASW | ELK  | ELK CITY MUNI              | OK | 149440. | 107277. | 134. | 1.45  | 1.71  |
| ASW | F91  | THOMAS P STAFFORD          | OK | 154899. | 60519.  | 143. | 1.03* | 1.43* |
| ASW | OK14 | GOLDSBY                    | OK | 81718.  | 131107. | 0.   | 1.28  | 1.41  |
| ASW | 2EJ  | EXPRESSWAY AIRPARK         | OK | 100391. | 99048.  | 0.   | 1.21  | 1.33  |
| ASW | CLK  | CLINTON MUNI               | OK | 138547. | 57662.  | 120. | 1.17  | 1.30  |
| ASW | F61  | PAULS VALLEY MUNI          | OK | 153580. | 35934.  | 960. | 2.02  | 1.26  |
| ASW | 0F8  | WILLIAM R. FOGUE MUNI      | OK | 145366. | 31675.  | 139. | 0.94* | 1.18* |
| ASW | 2DT  | DOWNTOWN AIRPARK           | OK | 78417.  | 91873.  | 0.   | 0.99  | 1.13  |
| ASW | F62  | IDABEL                     | OK | 125853. | 40470.  | 107. | 1.41  | 1.11  |
| ASW | CHK  | CHICKASHA MUNI             | OK | 85240.  | 71991.  | 0.   | 1.00  | 1.04  |
| ASW | 1F0  | DOWNTOWN ARDMORE           | OK | 65869.  | 76692.  | 6.   | 2.82  | 0.95  |
| ASW | MLC  | MC ALESTER MUNI            | OK | 43621.  | 97629.  | 3.   | 2.33  | 0.94  |
| ASW | 1H7  | GROVE MUNI                 | OK | 38756.  | 93189.  | 0.   | 0.65  | 0.88  |
| ASW | G3J  | GAGE MUNI                  | OK | 99048.  | 22562.  | 96.  | 0.76* | 0.81* |
| ASW | 5F2  | DOWNTOWN AIRPARK           | OK | 88438.  | 31546.  | 0.   | 0.88  | 0.80  |
| ASW | WWR  | WEST WOODWARD              | OK | 65795.  | 50177.  | 0.   | 2.34  | 0.77  |
| ASW | F28  | MUSTANG FIELD              | OK | 79441.  | 25928.  | 0.   | 0.78  | 0.70  |
| ASW | F10  | HENRYETTA MUNI             | OK | 83031.  | 16167.  | 68.  | 1.15  | 0.66  |
| ASW | RKR  | ROBERT S KERR              | OK | 44034.  | 51157.  | 92.  | 1.44  | 0.63  |
| ASW | H71  | PRYOR                      | OK | 49716.  | 43774.  | 0.   | 2.05  | 0.62  |
| ASW | HBR  | HOBERT MUNI                | OK | 75255.  | 18372.  | 73.  | 0.52  | 0.62  |

|     |      |                            |              |          |         |       |        |        |
|-----|------|----------------------------|--------------|----------|---------|-------|--------|--------|
| ASW | DUA  | EAKER FIELD                | DURANT       | 45846.   | 48114.  | 0.    | 1.21   | 0.62   |
| ASW | F31  | LAKE TEXOMA STATE PARK     | KINGSTON     | 13845.   | 76025.  | 0.    | 0.37   | 0.60   |
| ASW | MIO  | MIAMI MUNI                 | MIAMI        | 54301.   | 19008.  | 44.   | 0.63   | 0.49   |
| ASW | HAX  | HATBOX FIELD               | MUSKOGEE     | 40991.   | 31028.  | 0.    | 0.46   | 0.48   |
| ASW | H73  | TAHLEQUAH MUNI             | TAHLEQUAH    | 40896.   | 24964.  | 0.    | 0.44   | 0.44   |
| ASW | 6K4  | FAIRVIEW MUNI              | FAIRVIEW     | 42604.   | 22240.  | 0.    | 0.45   | 0.43   |
| ASW | F36  | CORDELL MUNI               | CORDELL      | 34723.   | 22830.  | 111.  | 0.76   | 0.38   |
| ASW | H05  | WILBURTON MUNI             | WILBURTON    | 19805.   | 34012.  | 0.    | 0.29   | 0.36   |
| ASW | 2F6  | SKIATOOK MUNI              | SKIATOOK     | 27568.   | 23062.  | 0.    | 0.32   | 0.34   |
| ASW | F22  | PERRY MUNI                 | PERRY        | 33486.   | 17550.  | 0.    | 0.35   | 0.34   |
| ASW | OK56 | BLACKWELL-TONKAWA MUNI     | BLACKWELL    | 38655.   | 9888.   | 132.  | 0.97   | 0.32   |
| ASW | OK08 | HILL TOP PVT               | LAWTON       | 34589.   | 11291.  | 0.    | 0.34   | 0.30   |
| ASW | 17K  | BOISE CITY                 | BOISE CITY   | 28214.   | 14775.  | 0.    | 0.30   | 0.29   |
| ASW | OK68 | MEDFORD MUNI               | MEDFORD      | 20914.   | 23453.  | 0.    | 0.26   | 0.29   |
| ASW | 6F3  | EAGLES NEST                | SAND SPRINGS | 31627.   | 10323.  | 0.    | 0.31   | 0.28   |
| ASW | H68  | WAGONER AIRSTRIP           | WAGONER      | 30253.   | 10485.  | 0.    | 0.22   | 0.27   |
| ASW | SUD  | STROUD MUNI                | STROUD       | 16563.   | 22033.  | 0.    | 0.24   | 0.26   |
| ASW | 2M3  | SALLISAW MUNI              | SALLISAW     | 22664.   | 12962.  | 0.    | 0.23   | 0.23   |
| ASW | 7F4  | SEQUOYAH PARK              | WAGONER      | 21771.   | 12672.  | 0.    | 0.23   | 0.22   |
| ASW | OK78 | WATONGA                    | WATONGA      | 20942.   | 12514.  | 0.    | 0.23   | 0.21   |
| ASW | 95F  | CLEVELAND MUNI             | CLEVELAND    | 23477.   | 7662.   | 0.    | 0.16   | 0.21   |
| ASW | F99  | HOLDENVILLE MUNI           | HOLDENVILLE  | 10796.   | 20638.  | 0.    | 0.23   | 0.21   |
| ASW | H76  | PAWUSKA MUNI               | PAWUSKA      | 23762.   | 7755.   | 0.    | 0.22   | 0.21   |
| ASW | 3F7  | JONES MEML                 | BRISTOW      | 21852.   | 10095.  | 0.    | 0.19   | 0.20   |
| ASW | 93F  | MIGNON LAIRD MUNI          | CHEYENNE     | 16829.   | 13827.  | 0.    | 0.17   | 0.20   |
| ASW | K92  | HI-WAY                     | BARTLESVILLE | 13959.   | 16361.  | 0.    | 0.15   | 0.17   |
| ASW | F30  | SULPHUR MUNI               | SULPHUR      | 12775.   | 12504.  | 0.    | 0.16   | 0.17   |
| ASW | 92F  | CHATTANOOGA SKY HARBOR     | CHATTANOOGA  | 14434.   | 10614.  | 0.    | 0.14   | 0.16   |
| ASW | 1F4  | MADILL MUNICIPAL           | MADILL       | 11587.   | 12116.  | 0.    | 0.15   | 0.15   |
| ASW | OK70 | MOORELAND MUNI             | MOORELAND    | 12939.   | 9790.   | 0.    | 0.16   | 0.13   |
| ASW | OK73 | SEILING                    | SEILING      | 15028.   | 7688.   | 0.    | 0.13   | 0.14   |
| ASW | OK60 | CHEROKEE MUNI              | CHEROKEE     | 11245.   | 9729.   | 0.    | 0.13   | 0.14   |
| ASW | OK7  | FOUNTAINHEAD LODGE AIRPARK | EUFULA       | 11619.   | 9357.   | 0.    | 0.15   | 0.14   |
| ASW | OK26 | TIPTON MUNI                | TIPTON       | 15330.   | 5004.   | 0.    | 0.14   | 0.13   |
| ASW | H04  | VINITA MUNI                | VINITA       | 13479.   | 5581.   | 0.    | 0.14   | 0.13   |
| ASW | H66  | NOWATA MUNI                | NOWATA       | 10376.   | 8952.   | 0.    | 0.14   | 0.13   |
| ASW | H01  | CHANDLER MUNI              | CHANDLER     | 14388.   | 4696.   | 0.    | 0.14   | 0.13   |
| ASW | Q44  | BEAVER MUNI                | BEAVER       | 8257.    | 9316.   | 0.    | 0.12   | 0.12   |
| ASW | F53  | NASH MUNI                  | HUGO         | 11278.   | 4863.   | 0.    | 0.12   | 0.11   |
| ASW | 1F1  | LAKE MURRAY STATE PARK     | OVERBROOK    | 12158.   | 3968.   | 0.    | 0.10   | 0.09   |
| ASW | 86F  | CARNEGIE MUNI              | CARNEGIE     | 10066.   | 3285.   | 0.    | 0.09   | 0.08   |
| ASW | 91F  | ARROWHEAD                  | CANADIAN     | 9643.    | 3147.   | 0.    | 0.07   | 0.08   |
| ASW | F32  | HEALDTON MUNI              | HEALDTON     | 4821.    | 7139.   | 0.    | 0.08   | 0.08   |
| ASW | 87F  | 81ST STREET AIRPARK        | BROKEN ARROW | 8706.    | 2841.   | 0.    | 0.05   | 0.05   |
| ASW | F38  | CANEY CREEK                | KINGSTON     | 5579.    | 1821.   | 0.    | 0.06   | 0.05   |
| ASW | K49  | MUNICIPAL                  | TEXOMA       | 6170.    | 2014.   | 0.    | 0.00   | 0.00   |
| ASW | 4F1  | KEYSTONE AIR PARK          | CLEVELAND    | 242.     | 79.     | 0.    | 0.00   | 0.00   |
| ASW | SGR  | HULL FIELD                 | HOUSTON      | 2466429. | 522147. | 2310. | 14.74  | 19.86  |
| ASW | ILE  | KILLEEN MUNI               | KILLEEN      | 1964283. | 445407. | 1859. | 11.59* | 16.01* |
| ASW | MDD  | MIDLAND AIRPARK            | MIDLAND      | 1943066. | 374619. | 1821. | 12.04* | 15.40* |
| ASW | TDW  | TRADEWIND                  | ANARILLO     | 1503804. | 327026. | 1399. | 9.27*  | 12.16* |
| ASW | HPY  | HUMPHREY                   | HOUSTON      | 1497868. | 261223. | 1394. | 9.03*  | 11.69* |
| ASW | DT0  | DENTON MUNI                | DENTON       | 1228634. | 227671. | 1122. | 7.24*  | 9.68*  |
| ASW | TPL  | DRAUGHON-MILLER MUNI       | TEMPLE       | 1117433. | 291292. | 1137. | 6.48   | 9.36   |
| ASW | AAP  | ANDRAU AIRPARK             | HOUSTON      | 1167602. | 199804. | 1110. | 8.60*  | 9.09*  |
| ASW | F42  | PHIL L HUDSON FIELD        | MESQUITE     | 1012519. | 203616. | 942.  | 6.17*  | 8.08*  |
| ASW | SPX  | HOUSTON GULF               | LEAGUE CITY  | 727633.  | 125654. | 685.  | 4.17*  | 5.67   |
| ASW | F54  | ARLINGTON MUNI             | ARLINGTON    | 645358.  | 152069. | 585.  | 4.82   | 5.30   |
| ASW | T02  | CLOVER FIELD               | HOUSTON      | 529242.  | 215960. | 0.    | 5.31   | 4.95   |

|     |      |                                  |                 |         |         |       |       |       |
|-----|------|----------------------------------|-----------------|---------|---------|-------|-------|-------|
| ASW | LFK  | ANGELINA COUNTY                  | LUFKIN          | 515024. | 187054. | 486.  | 3.24  | 4.66  |
| ASW | F60  | MCGREGOR MUNI                    | MCGREGOR        | 478981. | 162514. | 432.  | 3.52  | 4.26  |
| ASW | MWL  | MINERAL WELLS                    | MINERAL WELLS   | 502177. | 87601.  | 482.  | 3.11  | 3.92  |
| ASW | T27  | BURNET MUNI KATE CRADDOCK FIELD  | BURNET          | 447658. | 116112. | 424.  | 3.11* | 3.75* |
| ASW | T39  | HUNTSVILLE MUNI                  | HUNTSVILLE      | 484499. | 79339.  | 483.  | 2.18  | 3.75  |
| ASW | 3R3  | TIMS AIRPARK                     | AUSTIN          | 433810. | 119263. | 1085. | 7.34  | 3.67  |
| ASW | GVT  | MAJORS                           | GREENVILLE      | 544622. | 975866. | 486.  | 2.45* | 3.43* |
| ASW | E02  | SCHLEMEYER FIELD                 | ODESSA          | 367429. | 156826. | 834.  | 9.21  | 3.48* |
| ASW | F18  | CLEBURNE MUNI                    | CLEBURNE        | 429151. | 74757.  | 400.  | 2.60* | 3.35* |
| ASW | F67  | GRAND PRAIRIE MUNI               | GRAND PRAIRIE   | 304398. | 196112. | 0.    | 3.55  | 3.33  |
| ASW | ALI  | ALICE INTERNATIONAL              | ALICE           | 426824. | 71041.  | 3316. | 2.05  | 3.31  |
| ASW | T47  | KICKAPOO DOWNTOWN AIRPARK        | WICHITA FALLS   | 393232. | 86893.  | 353.  | 2.33* | 3.19* |
| ASW | T41  | LA PORTE MUNI                    | LA PORTE        | 375417. | 101058. | 1043. | 6.76  | 3.17  |
| ASW | BWD  | BROWNWOOD MUNI                   | BROWNWOOD       | 303703. | 161395. | 279.  | 3.87  | 3.09  |
| ASW | 21XS | BIG SPRING                       | BIG SPRING      | 390310. | 69776.  | 360.  | 2.32* | 3.06* |
| ASW | PRX  | COX FLD                          | PARIS           | 299977. | 155820. | 289.  | 2.41  | 3.03  |
| ASW | DHT  | DALHART MUNI                     | DALHART         | 315878. | 116966. | 262.  | 2.74  | 2.88  |
| ASW | F26  | DALLAS NORTH                     | PLANO           | 243494. | 184839. | 0.    | 2.88  | 2.85  |
| ASW | 3R0  | BEEVILLE MUNI                    | BEEVILLE        | 342328. | 60529.  | 328.  | 2.00* | 2.68* |
| ASW | F70  | MANGHAM FLD                      | FORT WORTH      | 282869. | 97698.  | 0.    | 2.78  | 2.53  |
| ASW | T69  | SINTON                           | SINTON          | 322499. | 54670.  | 179.  | 1.67  | 2.51  |
| ASW | T29  | PEARLAND                         | PEARLAND        | 194307. | 168784. | 0.    | 2.40  | 2.41  |
| ASW | DRT  | DEL RIO INTL                     | DEL RIO         | 226473. | 135097. | 866.  | 3.93  | 2.40  |
| ASW | TRL  | TERRELL MUNICIPAL                | TERRELL         | 296631. | 54806.  | 257.  | 2.33  | 2.34  |
| ASW | BMT  | BEAUMONT MUNI                    | BEAUMONT        | 221281. | 84509.  | 716.  | 4.77  | 2.03  |
| ASW | T17  | WEISER AIR PARK                  | HOUSTON         | 226577. | 73955.  | 0.    | 2.17  | 2.00  |
| ASW | CNW  | JAMES CONNALLY                   | WACO            | 233522. | 46084.  | 192.  | 1.43* | 1.86* |
| ASW | CRS  | CORSICANA MUNI                   | CORSICANA       | 234539. | 43326.  | 220.  | 1.36  | 1.85  |
| ASW | 3R1  | BAY CITY MUNI                    | BAY CITY        | 236195. | 41192.  | 220.  | 1.42* | 1.84* |
| ASW | GLE  | GAINESVILLE MUNI                 | GAINESVILLE     | 228635. | 43336.  | 209.  | 1.80  | 1.81  |
| ASW | T86  | LAKESIDE                         | HOUSTON         | 219921. | 52108.  | 955.  | 4.17  | 1.81  |
| ASW | LJN  | BRAZORIA COUNTY                  | LAKE JACKSON    | 122533. | 141221. | 201.  | 1.73  | 1.75  |
| ASW | PSX  | PALACIOS MUNI                    | PALACIOS        | 224414. | 34282.  | 92.   | 0.60  | 1.72  |
| ASW | 4R2  | HORSESHOE BAY                    | MARBLE FALLS    | 210184. | 36974.  | 190.  | 1.75  | 1.64  |
| ASW | F03  | MT PLEASANT MUNI                 | MT PLEASANT     | 204265. | 35633.  | 190.  | 1.24  | 1.59  |
| ASW | PEQ  | PECOS MUNI                       | PECOS CITY      | 181886. | 36999.  | 141.  | 1.84  | 1.45  |
| ASW | LNC  | LANCASTER                        | LANCASTER       | 184255. | 33440.  | 164.  | 1.93  | 1.45  |
| ASW | F82  | TOWN & COUNTRY AIRPARK           | LUBBOCK         | 154565. | 50450.  | 0.    | 1.51  | 1.36  |
| ASW | WEA  | PARKER COUNTY                    | WEATHERFORD     | 154758. | 45493.  | 517.  | 3.41  | 1.33  |
| ASW | JAS  | JASPER COUNTY AIRPORT-BELL FIELD | JASPER          | 171108. | 28340.  | 169.  | 0.90  | 1.33  |
| ASW | F69  | AIR PARK-DALLAS                  | DALLAS          | 150818. | 49228.  | 0.    | 1.47  | 1.33  |
| ASW | ASL  | HARRISON COUNTY                  | MARSHALL        | 167077. | 29138.  | 155.  | 1.01* | 1.30* |
| ASW | F05  | WILBARGER COUNTY                 | VERNON          | 163036. | 28507.  | 151.  | 1.00* | 1.27* |
| ASW | OCH  | EAST TEXAS REGIONAL              | NACOGDOCHES     | 62343.  | 125712. | 0.    | 2.70  | 1.25  |
| ASW | SNK  | WINSTON FIELD                    | SNYDER          | 154040. | 30152.  | 120.  | 1.47  | 1.22  |
| ASW | BGD  | HUTCHINSON COUNTY                | BORGER          | 78646.  | 101544. | 152.  | 2.11  | 1.20  |
| ASW | ELA  | EAGLE LAKE                       | EAGLE LAKE      | 137064. | 23465.  | 130.  | 0.71  | 1.07  |
| ASW | PPA  | PERRY LEFORS FIELD               | PAMPA           | 129820. | 28535.  | 85.   | 1.15  | 1.05  |
| ASW | PSN  | PALESTINE MUNI                   | PALESTINE       | 122193. | 26892.  | 114.  | 0.75  | 0.99  |
| ASW | FST  | PECOS COUNTY                     | FORT STOCKTON   | 122850. | 26290.  | 87.   | 1.60  | 0.99  |
| ASW | T98  | SAN MARCOS MUNI                  | SAN MARCOS      | 119796. | 29535.  | 465.  | 2.28  | 0.99  |
| ASW | CDS  | CHILDRESS MUNI                   | CHILDRESS       | 126985. | 21244.  | 124.  | 0.61  | 0.98  |
| ASW | T04  | GEORGETOWN MUNI                  | GEORGETOWN      | 107036. | 29546.  | 262.  | 1.84  | 0.91  |
| ASW | F46  | ROCKWALL MUNI                    | ROCKWALL        | 102339. | 33405.  | 0.    | 1.00  | 0.90  |
| ASW | F14  | WICHITA VALLEY                   | WICHITA FALLS   | 94221.  | 41595.  | 0.    | 3.13  | 0.90  |
| ASW | F39  | GRAYSON CO                       | SHERMAN-DENISON | 68992.  | 65720.  | 0.    | 2.41  | 0.90  |
| ASW | F72  | OAK GROVE                        | FORT WORTH      | 113181. | 20777.  | 99.   | 0.65* | 0.89* |
| ASW | SWI  | SHERMAN MUNICIPAL                | SHERMAN         | 102327. | 29720.  | 89.   | 0.83  | 0.88  |
| ASW | 7F3  | CADDO MILLS MUN                  | CADDO MILLS     | 100014. | 32648.  | 0.    | 0.98  | 0.88  |
| ASW | Q70  | STRATFORD FIELD                  | STRATFORD       | 109636. | 21875.  | 102.  | 0.67* | 0.87* |



|     |      |                            |    |        |        |      |       |       |
|-----|------|----------------------------|----|--------|--------|------|-------|-------|
| ASW | F04  | SAGINAW                    | TX | 37037. | 12089. | 0.   | 0.35  | 0.33  |
| ASW | T92  | MASON COUNTY               | TX | 39330. | 9521.  | 37.  | 0.26* | 0.32* |
| ASW | F13  | CHEROKEE COUNTY            | TX | 36553. | 11931. | 0.   | 1.21  | 0.32  |
| ASW | 69R  | EDWARDS COUNTY             | TX | 42065. | 6604.  | 138. | 0.16  | 0.32  |
| ASW | RFG  | ROOKE FIELD                | TX | 37004. | 9748.  | 113. | 0.73  | 0.31  |
| ASW | Q54  | BENGER AIR PARK            | TX | 34421. | 11236. | 0.   | 0.34  | 0.30  |
| ASW | 1E5  | HEMPHILL COUNTY            | TX | 35405. | 9524.  | 12.  | 0.73  | 0.30  |
| ASW | 5R5  | WHARTON MUNI               | TX | 33878. | 11058. | 0.   | 1.11  | 0.30  |
| ASW | T00  | CHAMBERS COUNTY            | TX | 33929. | 11075. | 0.   | 0.33  | 0.30  |
| ASW | T90  | GUADALUPE COUNTY           | TX | 33878. | 11058. | 0.   | 0.33  | 0.30  |
| ASW | 6R4  | BIRD'S NEST                | TX | 35479. | 9233.  | 114. | 0.74  | 0.30  |
| ASW | 52F  | AERO VALLEY                | TX | 33270. | 10862. | 0.   | 0.32  | 0.29  |
| ASW | 61F  | KEZER AIR RANCH            | TX | 31487. | 10278. | 0.   | 0.30  | 0.28  |
| ASW | 2F7  | COMMERCE MUNI              | TX | 34559. | 6027.  | 32.  | 0.21* | 0.27* |
| ASW | EGP  | EAGLE PASS MUNI            | TX | 28645. | 9768.  | 0.   | 0.29  | 0.26  |
| ASW | Q41  | FLOYDADA MUNI              | TX | 29644. | 9676.  | 0.   | 0.29  | 0.26  |
| ASW | F00  | JONES FIELD                | TX | 28644. | 9676.  | 0.   | 0.29  | 0.26  |
| ASW | BKD  | STEPHENS COUNTY            | TX | 29755. | 9691.  | 1.   | 0.97  | 0.26  |
| ASW | E52  | VEGA-OLDHAM COUNTY         | TX | 28833. | 9413.  | 0.   | 0.28  | 0.25  |
| ASW | T53  | NUECES COUNTY              | TX | 27527. | 8985.  | 0.   | 0.27  | 0.24  |
| ASW | T72  | HEARNE MUNI                | TX | 27526. | 8984.  | 0.   | 0.27  | 0.24  |
| ASW | ONY  | OLNEY MUNI                 | TX | 24812. | 11632. | 81.  | 0.54  | 0.24  |
| ASW | Q43  | SUNRAY                     | TX | 26687. | 8711.  | 0.   | 0.26  | 0.24  |
| ASW | ECE  | EL CAMPO METRO AIRPORT INC | TX | 27632. | 9019.  | 0.   | 0.27  | 0.24  |
| ASW | 40F  | FLYING TIGERS              | TX | 22297. | 13163. | 0.   | 0.23  | 0.24  |
| ASW | E11  | ANDREWS COUNTY             | TX | 27527. | 3985.  | 0.   | 0.90  | 0.24  |
| ASW | T78  | LIBERTY MUNI               | TX | 26463. | 8637.  | 0.   | 0.26  | 0.23  |
| ASW | T31  | PORT ISABEL-CAMERON COUNTY | TX | 26882. | 7237.  | 75.  | 0.49  | 0.23  |
| ASW | TX05 | AERO COUNTRY               | TX | 26214. | 8555.  | 0.   | 0.25  | 0.23  |
| ASW | VHN  | CULBERSON COUNTY           | TX | 18462. | 8637.  | 0.   | 0.87  | 0.23  |
| ASW | SLR  | SULPHUR SPRINGS MUNI       | TX | 18428. | 15725. | 0.   | 0.76  | 0.23  |
| ASW | 31R  | GIDDINGS-LEE COUNTY        | TX | 29676. | 5174.  | 27.  | 0.18* | 0.23* |
| ASW | E35  | FABENS                     | TX | 25054. | 8178.  | 0.   | 0.24  | 0.22  |
| ASW | ATA  | ATLANTA MUNI               | TX | 25408. | 8293.  | 0.   | 0.83  | 0.22  |
| ASW | E13  | CRANE COUNTY               | TX | 25408. | 8293.  | 0.   | 0.25  | 0.22  |
| ASW | E29  | SONORA MUNI                | TX | 23689. | 7461.  | 13.  | 0.73  | 0.21  |
| ASW | Q46  | EDWARD WARREN FLD          | TX | 23393. | 7636.  | 0.   | 0.23  | 0.21  |
| ASW | 59F  | SEAGOVILLE                 | TX | 23965. | 7822.  | 0.   | 0.23  | 0.21  |
| ASW | E01  | ROY HURD MEMORIAL          | TX | 24350. | 7948.  | 0.   | 0.24  | 0.21  |
| ASW | 3F6  | DAN E RICHARDS MUNICIPAL   | TX | 23323. | 7613.  | 0.   | 0.23  | 0.21  |
| ASW | 26R  | JACKSON COUNTY             | TX | 22234. | 7257.  | 0.   | 0.22  | 0.20  |
| ASW | 2R9  | KARNES COUNTY              | TX | 23135. | 6296.  | 61.  | 0.40  | 0.20  |
| ASW | 3R9  | LAKELWAY AIRPARK           | TX | 23065. | 7527.  | 0.   | 0.22  | 0.20  |
| ASW | F06  | MARIAN AIRPARK             | TX | 22198. | 7246.  | 0.   | 0.22  | 0.20  |
| ASW | 07R  | BISHOP MUNI                | TX | 21786. | 7111.  | 0.   | 0.21  | 0.19  |
| ASW | 00R  | LIVINGSTON MUNI            | TX | 21344. | 6967.  | 0.   | 0.20  | 0.19  |
| ASW | 11R  | BRENNHAM MUNI              | TX | 22478. | 5896.  | 70.  | 0.58  | 0.19  |
| ASW | 88D  | CURTIS FIELD               | TX | 21170. | 6910.  | 0.   | 0.21  | 0.19  |
| ASW | F56  | ARLEDGE FIELD              | TX | 21170. | 6910.  | 0.   | 0.21  | 0.19  |
| ASW | 3F0  | BLUE MOUND                 | TX | 19608. | 7290.  | 0.   | 0.19  | 0.18  |
| ASW | COM  | COLEMAN MUNI               | TX | 21541. | 5513.  | 74.  | 0.50  | 0.18  |
| ASW | 1F3  | HARTLEE FIELD              | TX | 20525. | 6700.  | 0.   | 0.20  | 0.18  |
| ASW | TX80 | FOLLETT/LIPSCOMB COUNTY    | TX | 21501. | 5708.  | 64.  | 0.41  | 0.18* |
| ASW | JCT  | KIMBLE COUNTY              | TX | 23048. | 4020.  | 21.  | 0.14* | 0.18* |
| ASW | ETN  | EASTLAND MUNI              | TX | 20274. | 5276.  | 65.  | 0.42  | 0.17  |
| ASW | E57  | DENVER CITY                | TX | 19057. | 6220.  | 0.   | 0.19  | 0.17  |
| ASW | F25  | OBRIEN AIRPARK             | TX | 18518. | 6044.  | 0.   | 0.18  | 0.16  |
| ASW | 2F9  | TOM DANAEHER               | TX | 18518. | 6044.  | 0.   | 0.18  | 0.16  |
| ASW | 07F  | GLADEWATER MUNI            | TX | 17624. | 5752.  | 0.   | 0.17  | 0.16  |
| ASW | 1E9  | GARTRELL FIELD             | TX | 18518. | 6044.  | 0.   | 0.18  | 0.16  |

| TX06     | MEXIA-LIMESTONE CO.       | TX | 18502. | 4874. | 57. | 0.36  | 0.16  |
|----------|---------------------------|----|--------|-------|-----|-------|-------|
| ASW 74R  | HORIZON                   | TX | 17873. | 5833. | 0.  | 0.17  | 0.16  |
| ASW 728  | LAMPASAS                  | TX | 19066. | 4841. | 67. | 0.38  | 0.16  |
| ASW F75  | KNOX CITY MUNI            | TX | 17191. | 5611. | 0.  | 0.16  | 0.15  |
| ASW 23R  | DEVINE MUNI               | TX | 16708. | 5453. | 0.  | 0.16  | 0.15  |
| ASW 7F6  | CLARKSVILLE-RED RIVER CO  | TX | 16938. | 5528. | 0.  | 0.16  | 0.15  |
| ASW 7R9  | BAILES                    | TX | 17445. | 5694. | 0.  | 0.17  | 0.15  |
| ASW T03  | GENOA                     | TX | 16253. | 5306. | 0.  | 0.16  | 0.14  |
| ASW 3F2  | CISCO MUNI                | TX | 11646. | 9168. | 0.  | 0.13  | 0.14  |
| ASW T42  | BALL                      | TX | 15998. | 5222. | 0.  | 0.15  | 0.14  |
| ASW 45R  | HARDIN COUNTY             | TX | 15830. | 5183. | 0.  | 0.15  | 0.14  |
| ASW 6R3  | CLEVELAND MUNI            | TX | 14819. | 4837. | 0.  | 0.14  | 0.13  |
| ASW T74  | TAYLOR MUNI               | TX | 14218. | 4641. | 0.  | 0.14  | 0.13  |
| ASW 64R  | PEARLAND                  | TX | 16463. | 3798. | 77. | 0.20  | 0.13  |
| ASW F98  | YOAKUM COUNTY             | TX | 14161. | 4622. | 0.  | 0.14  | 0.12  |
| ASW 900  | MUNICIPAL                 | TX | 13761. | 4492. | 0.  | 0.13  | 0.12  |
| ASW 5F1  | POST-GARZA COUNTY MUNI    | TX | 13903. | 4538. | 0.  | 0.14  | 0.12  |
| ASW F85  | COCHRAN COUNTY            | TX | 13367. | 4363. | 0.  | 0.13  | 0.12  |
| ASW T96  | EL CAMPO AIRPARK          | TX | 12504. | 4082. | 0.  | 0.12  | 0.11  |
| ASW F45  | IRAAN MUNI                | TX | 10893. | 3556. | 0.  | 0.10  | 0.10  |
| ASW T12  | KIRBYVILLE                | TX | 10893. | 3556. | 0.  | 0.10  | 0.10  |
| ASW 9F9  | SYCAMORE STRIP            | TX | 10952. | 3575. | 0.  | 0.11  | 0.10  |
| ASW 81R  | SAN SABA COUNTY MUNICIPAL | TX | 10893. | 3556. | 0.  | 0.10  | 0.10  |
| ASW 31F  | GAINES COUNTY             | TX | 11645. | 3801. | 0.  | 0.11  | 0.10  |
| ASW PEZ  | PLEASANTON MUNI           | TX | 11646. | 3801. | 0.  | 0.11  | 0.10  |
| ASW F21  | MEMPHIS MUNI              | TX | 10585. | 3455. | 0.  | 0.10  | 0.09  |
| ASW 77F  | WINTERS MUNI              | TX | 11355. | 2941. | 37. | 0.24  | 0.09  |
| ASW 7F7  | CLIFTON MUNI              | TX | 10585. | 3455. | 0.  | 0.10  | 0.09  |
| ASW 60F  | SEYMOUR MUNI              | TX | 10585. | 3455. | 0.  | 0.10  | 0.09  |
| ASW 60R  | NAVASOTA MUNI             | TX | 11870. | 2070. | 11. | 0.07* | 0.09* |
| ASW T26  | BAY CITY                  | TX | 10076. | 3289. | 0.  | 0.10  | 0.09  |
| ASW F83  | ABERNATHY MUNI            | TX | 9055.  | 2956. | 0.  | 0.09  | 0.08  |
| ASW T56  | HOUSTON COUNTY            | TX | 8927.  | 2914. | 0.  | 0.09  | 0.08  |
| ASW F97  | SEAGRAVES                 | TX | 9446.  | 3083. | 0.  | 0.09  | 0.08  |
| ASW E34  | CLARENDON MUNI            | TX | 8715.  | 2844. | 0.  | 0.08  | 0.08  |
| ASW 7F9  | COMANCHE COUNTY-CITY      | TX | 9589.  | 3130. | 0.  | 0.09  | 0.08  |
| ASW T21  | HAMILTON MUNI             | TX | 9527.  | 3110. | 0.  | 0.09  | 0.08  |
| ASW 4F4  | GILMER-UPSHUR COUNTY      | TX | 7414.  | 2420. | 0.  | 0.07  | 0.07  |
| ASW 54R  | ZUEHL                     | TX | 8254.  | 2695. | 0.  | 0.08  | 0.07  |
| ASW 8F4  | FOARD COUNTY              | TX | 8465.  | 2763. | 0.  | 0.08  | 0.07  |
| ASW T94  | TWIN-OAKS                 | TX | 8476.  | 2767. | 0.  | 0.08  | 0.07  |
| ASW F64  | FLYING OAKS               | TX | 7999.  | 2611. | 0.  | 0.08  | 0.07  |
| ASW 21F  | JACKSBORO MUNI            | TX | 8484.  | 2769. | 0.  | 0.08  | 0.07  |
| ASW TX07 | PRESIDIO LELY INTL        | TX | 8272.  | 2700. | 0.  | 0.08  | 0.07  |
| ASW F01  | QUANAH MUNI               | TX | 7415.  | 2420. | 0.  | 0.07  | 0.07  |
| ASW E30  | BRUCE FIELD               | TX | 8466.  | 2763. | 0.  | 0.08  | 0.07  |
| ASW 8F3  | CROSBYTON MUNI            | TX | 6352.  | 2073. | 0.  | 0.06  | 0.06  |
| ASW 05F  | CITY-COUNTY               | TX | 6352.  | 2073. | 0.  | 0.06  | 0.06  |
| ASW 28F  | ALTA VISTA                | TX | 6552.  | 2139. | 0.  | 0.06  | 0.06  |
| ASW 9R4  | TANNER'S                  | TX | 5701.  | 1861. | 0.  | 0.05  | 0.05  |
| ASW F66  | CARROLL AIR PARK          | TX | 5531.  | 1806. | 0.  | 0.05  | 0.05  |
| ASW T33  | FLYING L RANCH            | TX | 5447.  | 1778. | 0.  | 0.05  | 0.05  |
| ASW 34R  | HALLETTSVILLE MUNI        | TX | 6203.  | 2024. | 0.  | 0.06  | 0.05  |
| ASW 37F  | MUNDAY MUNICIPAL          | TX | 6122.  | 1998. | 0.  | 0.06  | 0.05  |
| ASW 1E4  | PALO DURO                 | TX | 6194.  | 2022. | 0.  | 0.06  | 0.05  |
| ASW 70F  | FLYING HEART RANCH        | TX | 4000.  | 1306. | 0.  | 0.04  | 0.04  |
| ASW 9F0  | DUBLIN MUNICIPAL          | TX | 4237.  | 1383. | 0.  | 0.04  | 0.04  |
| ASW 68F  | TEAGUE MUNICIPAL          | TX | 3064.  | 1000. | 0.  | 0.03  | 0.03  |
| ASW 46F  | LAVON NORTH               | TX | 2129.  | 695.  | 0.  | 0.02  | 0.02  |
| ASW 63F  | MUNI                      | TX | 1606.  | 524.  | 0.  | 0.02  | 0.01  |

ASW TA41 SUNLAND AIRPARK

## WESTERN PACIFIC REGION

|     |     |                                        |
|-----|-----|----------------------------------------|
| AWP | P16 | FALCON FIELD                           |
| AWP | PRC | PRESCOTT MUNI                          |
| AWP | P08 | COOLIDGE FLORENCE MUNI                 |
| AWP | P37 | GLENDALÉ MUNI                          |
| AWP | FHU | SIERRA VISTA MUNI                      |
| AWP | INW | WINSLOW MUNI                           |
| AWP | P10 | CHANDLER MUNI                          |
| AWP | PGA | PAGE MUNICIPAL                         |
| AWP | LHU | LAKE HAVASU CITY                       |
| AWP | P06 | BULLHEAD CITY                          |
| AWP | E63 | GILA BEND MUNI                         |
| AWP | P14 | HOLBROOK MUNI                          |
| AWP | P34 | WINDOW ROCK                            |
| AWP | RYN | RYAN FIELD                             |
| AWP | SOW | SHOW LOW MUNI                          |
| AWP | DUG | BISBEE DOUGLAS INTL                    |
| AWP | SEZ | SEDONA                                 |
| AWP | P33 | COCHISE COUNTY                         |
| AWP | SJN | ST JOHNS MUNI                          |
| AWP | E14 | AVRA VALLEY                            |
| AWP | E18 | CAREFREE                               |
| AWP | Q35 | SPRINGERVILLE-EAGAR MUNI               |
| AWP | P32 | WILLIAMS MUNI                          |
| AWP | SAD | SAFFORD MUNI                           |
| AWP | CGZ | CASA GRANDE MUNI                       |
| AWP | IGM | MOHAVE COUNTY                          |
| AWP | E51 | BAGDAD                                 |
| AWP | P52 | COTTONWOOD                             |
| AWP | P20 | PARKER MUNI                            |
| AWP | L07 | MEMORIAL AIRFIELD                      |
| AWP | 4PH | POLACCA                                |
| AWP | 4E0 | TAYLOR                                 |
| AWP | P13 | GLOBE-SAN CARLOS REGIONAL AIR FACILITY |
| AWP | E55 | PIERCE                                 |
| AWP | P19 | STELLAR AIRPARK                        |
| AWP | OLS | NOGALES INTL                           |
| AWP | E69 | PAYSON                                 |
| AWP | MZJ | MARANA AIRPARK                         |
| AWP | E60 | ELOY MUNI                              |
| AWP | DGL | DOUGLAS MUNI                           |
| AWP | E19 | TURF                                   |
| AWP | TBC | TUBA CITY                              |
| AWP | P04 | BISBEE MUNI                            |
| AWP | BXK | BUCKEYE MUNI                           |
| AWP | E25 | WICKENBURG MUNI                        |
| AWP | 01E | HEREFORD                               |
| AWP | E78 | SELLS                                  |
| AWP | E24 | WHITERIVER                             |
| AWP | E64 | FRAM                                   |
| AWP | CFT | GREENLEE COUNTY                        |
| AWP | 0V7 | KAYENTA                                |
| AWP | U30 | TEMPLE BAR                             |
| AWP | E58 | THREE POINT                            |
| AWP | E76 | RIMROCK                                |

EL PASO

TX

1702.

556.

0.

0.02

0.01

|                  |         |         |      |       |       |
|------------------|---------|---------|------|-------|-------|
| MESA             | 509984. | 271816. | 0.   | 6.45  | 5.19  |
| PRESCOTT         | 475662. | 259239. | 3.   | 15.69 | 4.39  |
| COOLIDGE         | 336338. | 109791. | 0.   | 3.88  | 2.96  |
| GLENDALÉ         | 310413. | 115502. | 0.   | 2.57  | 2.83  |
| SIERRA V         | 216665. | 149470. | 264. | 1.57* | 2.43* |
| WINSLOW          | 173958. | 147198. | 97.  | 4.51  | 2.17  |
| CHANDLER         | 184867. | 112980. | 0.   | 1.92  | 1.98  |
| PAGE             | 116369. | 143344. | 0.   | 4.66  | 1.73  |
| LAKE HAVASU CITY | 101116. | 138343. | 1.   | 4.57  | 1.59  |
| BULLHEAD CITY    | 100047. | 138013. | 0.   | 1.44  | 1.47  |
| GILA BEND        | 127504. | 94376.  | 0.   | 1.36  | 1.47  |
| HOLBROOK         | 140048. | 63293.  | 0.   | 1.37  | 1.35  |
| WINDOW ROCK      | 73574.  | 120591. | 51.  | 0.94* | 1.29* |
| TUCSON           | 138564. | 48129.  | 0.   | 1.31  | 1.24  |
| SHOW LOW         | 59512.  | 116346. | 0.   | 0.92  | 1.17  |
| DOUGLAS BISBEE   | 86827.  | 85256.  | 11.  | 2.92  | 1.14  |
| SEDONA           | 74106.  | 74318.  | 66.  | 0.60* | 0.99* |
| WILLCOX          | 94333.  | 42037.  | 0.   | 0.92  | 0.91  |
| ST JOHNS         | 41718.  | 93371.  | 152. | 1.40  | 0.90  |
| TUCSON           | 98464.  | 32148.  | 0.   | 0.93  | 0.87  |
| CAREFREE         | 16956.  | 110897. | 0.   | 0.66  | 0.85  |
| SPRINGERVILLE    | 15091.  | 110289. | 0.   | 0.65  | 0.83  |
| WILLIAMS         | 9712.   | 108533. | 0.   | 0.60  | 0.79  |
| SAFFORD          | 58650.  | 45509.  | 0.   | 0.64  | 0.69  |
| CASA GRANDE      | 72976.  | 23823.  | 0.   | 0.69  | 0.64  |
| KINGMAN          | 37659.  | 57816.  | 1.   | 1.00  | 0.63  |
| BAGDAD           | 25910.  | 64677.  | 0.   | 0.42  | 0.60  |
| COTTONWOOD       | 23854.  | 66364.  | 0.   | 0.41  | 0.60  |
| PARKER           | 43694.  | 46465.  | 0.   | 0.51  | 0.60  |
| CHANDLER         | 63325.  | 20675.  | 0.   | 0.58  | 0.56  |
| POLACCA          | 7315.   | 71961.  | 0.   | 0.29  | 0.53  |
| TAYLOR           | 7339.   | 66628.  | 0.   | 0.27  | 0.49  |
| GLOBE            | 38120.  | 24136.  | 0.   | 0.39  | 0.41  |
| BUCKEYE          | 45850.  | 14969.  | 0.   | 0.42  | 0.40  |
| CHANDLER         | 41402.  | 13515.  | 0.   | 0.38  | 0.36  |
| NOGALES          | 38715.  | 12635.  | 0.   | 0.36  | 0.34  |
| PAYSON           | 24814.  | 14381.  | 0.   | 0.25  | 0.26  |
| MARANA           | 27759.  | 9131.   | 0.   | 0.26  | 0.25  |
| ELOY             | 14188.  | 22201.  | 0.   | 0.19  | 0.24  |
| DOUGLAS          | 22373.  | 7304.   | 0.   | 0.22  | 0.20  |
| PHOENIX          | 22115.  | 7219.   | 0.   | 0.22  | 0.19  |
| TUBA CITY        | 14159.  | 4621.   | 0.   | 0.13  | 0.12  |
| BISBEE           | 7907.   | 8205.   | 0.   | 0.09  | 0.11  |
| BUCKEYE          | 11469.  | 3744.   | 0.   | 0.11  | 0.10  |
| WICKENBURG       | 9062.   | 5101.   | 0.   | 0.09  | 0.09  |
| SIERRA VISTA     | 7862.   | 2566.   | 0.   | 0.07  | 0.07  |
| HELLS            | 7002.   | 2285.   | 0.   | 0.06  | 0.06  |
| WHITERIVER       | 6376.   | 2081.   | 0.   | 0.06  | 0.06  |
| GLENDALÉ         | 5175.   | 1689.   | 0.   | 0.05  | 0.05  |
| CLIFTON-MORENCI  | 6239.   | 2036.   | 0.   | 0.06  | 0.05  |
| KAYENTA          | 3901.   | 1273.   | 0.   | 0.04  | 0.03  |
| TEMPLE BAR       | 1484.   | 3302.   | 0.   | 0.62  | 0.03  |
| CASA GRANDE      | 2433.   | 794.    | 0.   | 0.02  | 0.02  |
| RIMROCK          | 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 | GNOS 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.  | 177307. | 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   | 2.33*  |
| 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.    | 2.13   | 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 | BLTYHE                                  | 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                                | AVOLON                 | 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 | MTH | 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   |

|     |     |                            |                    |         |         |      |       |       |
|-----|-----|----------------------------|--------------------|---------|---------|------|-------|-------|
| CLG | CLG | COALINGA MUNI              | COALINGA           | 60785.  | 123023. | 0.   | 1.09  | 1.22  |
| AWP | AWP | CHESTER                    | CHESTER            | 133514. | 46782.  | 136. | 1.18* | 1.20* |
| AWP | AWP | CALISTOGA AIRPARK          | CALISTOGA          | 135955. | 44384.  | 0.   | 1.42  | 1.20  |
| AWP | AWP | REDLANDS MUNI              | REDLANDS           | 90665.  | 87412.  | 0.   | 1.17  | 1.18  |
| AWP | AWP | UNIVERSITY                 | DAVIS              | 134753. | 43518.  | 491. | 3.47  | 1.18  |
| AWP | AWP | CALEXICO INTL              | CALEXICO           | 89183.  | 87015.  | 0.   | 1.15  | 1.17  |
| AWP | AWP | FALL RIVER MILLS           | FALL RIVER MILLS   | 52559.  | 122550. | 0.   | 1.06  | 1.16  |
| AWP | AWP | TRACY MUNI                 | TRACY              | 117954. | 50630.  | 0.   | 3.13  | 1.12  |
| AWP | AWP | LAMPSON                    | LAKEPORT           | 102386. | 57625.  | 0.   | 1.16  | 1.06  |
| AWP | AWP | BISHOP                     | BISHOP             | 41230.  | 11819.  | 0.   | 2.44  | 1.06  |
| AWP | AWP | PETALUMA SKY RANCH         | PETALUMA           | 99591.  | 56112.  | 0.   | 1.13  | 1.03  |
| AWP | AWP | AUBURN MUNI                | AUBURN             | 87327.  | 62241.  | 0.   | 1.03  | 0.99  |
| AWP | AWP | OCEANSIDE MUNI             | OCEANSIDE          | 103093. | 45776.  | 0.   | 1.12  | 0.99  |
| AWP | AWP | HANFORD MUNI               | HANFORD            | 109548. | 35757.  | 0.   | 3.86  | 0.97  |
| AWP | AWP | TEHACHAPI-KERN COUNTY      | TEHACHAPI          | 54551.  | 90167.  | 0.   | 0.84  | 0.96  |
| AWP | AWP | ANTIOCH                    | ANTIOCH            | 107424. | 35064.  | 0.   | 1.12  | 0.95  |
| AWP | AWP | MOJAVE                     | MOJAVE             | 32304.  | 108357. | 0.   | 0.74  | 0.93  |
| AWP | AWP | SONOMA VALLEY              | SCHELLVILLE-SONOMA | 104906. | 34239.  | 0.   | 1.10  | 0.92  |
| AWP | AWP | MENDOCINO COUNTY           | LITTLE RIVER       | 22017.  | 112550. | 0.   | 0.74  | 0.89  |
| AWP | AWP | BAKERSFIELD AIRPARK        | BAKERSFIELD        | 99591.  | 32506.  | 0.   | 1.04  | 0.88  |
| AWP | AWP | INYO-KERN COUNTY           | INYO-KERN          | 19647.  | 111775. | 0.   | 0.71  | 0.87  |
| AWP | AWP | TULARE MUNICIPAL           | TULARE             | 92764.  | 33680.  | 0.   | 0.98  | 0.84  |
| AWP | AWP | MADERA MUNI                | MADERA             | 85154.  | 35025.  | 0.   | 4.61  | 0.80  |
| AWP | AWP | RAMONA                     | RAMONA             | 90205.  | 29447.  | 0.   | 0.94  | 0.80  |
| AWP | AWP | BORREGO VALLEY             | BORREGO SPRINGS    | 65206.  | 51497.  | 0.   | 0.79  | 0.78  |
| AWP | AWP | PINE MOUNTAIN LAKE         | GROVELAND          | 84129.  | 83631.  | 0.   | 0.63  | 0.78  |
| AWP | AWP | THERMAL                    | THERMAL            | 88195.  | 28784.  | 0.   | 0.92  | 0.78  |
| AWP | AWP | RIO VISTA MUNI             | RIO VISTA          | 88195.  | 28784.  | 0.   | 0.89  | 0.76  |
| AWP | AWP | SKYLARK FIELD              | ELSIANDRE          | 86162.  | 28131.  | 0.   | 0.90  | 0.76  |
| AWP | AWP | CALAVERAS COUNTY           | SAN ANDREAS        | 58611.  | 54512.  | 0.   | 0.71  | 0.75  |
| AWP | AWP | CHOWCHILLA                 | CHOWCHILLA         | 69263.  | 37069.  | 0.   | 0.78  | 0.71  |
| AWP | AWP | WESTOVER FLD AMADOR COUNTY | JACKSON            | 62965.  | 39858.  | 0.   | 0.73  | 0.68  |
| AWP | AWP | BANNING MUNI               | BANNING            | 68258.  | 31939.  | 0.   | 0.75  | 0.67  |
| AWP | AWP | CALIFORNIA CITY MUNI       | CALIFORNIA CITY    | 68276.  | 31929.  | 0.   | 0.75  | 0.67  |
| AWP | AWP | BIG BEAR CITY              | BIG BEAR           | 72598.  | 23692.  | 0.   | 0.76  | 0.64  |
| AWP | AWP | AGUA DULCE AIRPARK         | AGUA DULCE         | 73134.  | 23869.  | 0.   | 0.76  | 0.64  |
| AWP | AWP | PERRIS VALLEY              | PERRIS             | 71359.  | 23296.  | 0.   | 0.72  | 0.63  |
| AWP | AWP | RANCHO CALIFORNIA          | TEMECULA           | 51676.  | 43671.  | 0.   | 0.61  | 0.63  |
| AWP | AWP | SELMA                      | SELMA              | 58780.  | 34986.  | 0.   | 0.67  | 0.62  |
| AWP | AWP | SUTTER COUNTY              | YUBA CITY          | 63512.  | 26356.  | 0.   | 0.68  | 0.60  |
| AWP | AWP | SUSANVILLE MUNI            | SUSANVILLE         | 39351.  | 49017.  | 0.   | 0.55  | 0.59  |
| AWP | AWP | SAN FERNANDO               | SAN FERNANDO       | 66840.  | 21818.  | 0.   | 0.63  | 0.59  |
| AWP | AWP | CAMERON AIRPARK            | SHINGLE SPRINGS    | 58243.  | 28655.  | 0.   | 0.64  | 0.58  |
| AWP | AWP | WEAVERVILLE                | WEAVERVILLE        | 29375.  | 57871.  | 0.   | 0.49  | 0.58  |
| AWP | AWP | OCEANO-COUNTY              | OCEANO             | 65068.  | 21236.  | 0.   | 0.65  | 0.57  |
| AWP | AWP | LINCOLN MUNI               | LINCOLN            | 40686.  | 56891.  | 0.   | 0.46  | 0.56  |
| AWP | AWP | WOODLAKE                   | WOODLAKE           | 46161.  | 37559.  | 0.   | 0.56  | 0.56  |
| AWP | AWP | PEARCE FIELD               | LOWER LAKE         | 60872.  | 19867.  | 0.   | 0.64  | 0.54  |
| AWP | AWP | RIO LINDA                  | RIO LINDA          | 57627.  | 20022.  | 0.   | 0.61  | 0.52  |
| AWP | AWP | HAIGH FIELD                | ORLAND             | 54494.  | 22573.  | 0.   | 0.59  | 0.51  |
| AWP | AWP | APPLE VALLEY               | APPLE VALLEY       | 58417.  | 19068.  | 0.   | 0.61  | 0.51  |
| AWP | AWP | MESA DEL REY               | KING CITY          | 41960.  | 34898.  | 0.   | 0.52  | 0.51  |
| AWP | AWP | EL MIRAGE FLD              | ADELANTO           | 55390.  | 18083.  | 0.   | 0.58  | 0.49  |
| AWP | AWP | CRYSTAL                    | LLANO              | 54309.  | 17729.  | 0.   | 0.55  | 0.48  |
| AWP | AWP | HEALDSBURG MUNI            | HEALDSBURG         | 52796.  | 19927.  | 0.   | 0.54  | 0.48  |
| AWP | AWP | GANSNER FIELD              | QUINCY             | 21056.  | 50333.  | 0.   | 0.38  | 0.47  |
| AWP | AWP | BARSTOW-DAGGETT            | DAGGETT            | 51734.  | 16290.  | 11.  | 1.77  | 0.45  |
| AWP | AWP | GREEN ACRES                | VISALIA            | 17664.  | 47571.  | 0.   | 0.33  | 0.43  |
| AWP | AWP | SMITH RANCH                | SAN RAFAEL         | 49264.  | 16077.  | 0.   | 0.49  | 0.43  |
| AWP | AWP | FIREBAUGH                  | FIREBAUGH          | 46016.  | 15017.  | 0.   | 0.46  | 0.41  |

|      |     |                             |    |        |        |    |      |      |
|------|-----|-----------------------------|----|--------|--------|----|------|------|
| 059  | AWP | CEDARVILLE                  | CA | 9860.  | 51495. | 0. | 0.29 | 0.41 |
| 023  | AWP | RANCHAERO                   | CA | 25586. | 35155. | 0. | 0.35 | 0.40 |
| Q31  | AWP | SEQUOIA FIELD               | CA | 44483. | 14521. | 0. | 0.47 | 0.39 |
| 060  | AWP | ROSAFOND                    | CA | 44492. | 14526. | 0. | 0.45 | 0.39 |
| Q96  | AWP | CLOVERDALE MUNI             | CA | 35693. | 21295. | 0. | 0.41 | 0.38 |
| TNP  | AWP | NATOMAS FLD                 | CA | 43447. | 14183. | 0. | 0.44 | 0.38 |
| L06  | AWP | TWENTYNINE PALMS            | CA | 41960. | 13695. | 0. | 0.44 | 0.37 |
| 020  | AWP | DEATH VALLEY                | CA | 32061. | 21708. | 0. | 0.37 | 0.36 |
| 002  | AWP | KINGDON AIRPARK             | CA | 40420. | 13192. | 0. | 0.40 | 0.36 |
| Q07  | AWP | BECKMOURTH                  | CA | 28239. | 26115. | 0. | 0.36 | 0.36 |
| 026  | AWP | RANCHO MURIETA              | CA | 40838. | 13326. | 0. | 0.41 | 0.36 |
| Q04  | AWP | LONE PINE                   | CA | 14837. | 38582. | 0. | 0.27 | 0.35 |
| 203  | AWP | CORNING MUNI                | CA | 28368. | 23721. | 0. | 0.35 | 0.35 |
| G46  | AWP | ANGWIN                      | CA | 36649. | 13086. | 0. | 0.39 | 0.33 |
| 015  | AWP | WEED                        | CA | 28644. | 20594. | 0. | 0.34 | 0.33 |
| L84  | AWP | TURLOCK MUNI                | CA | 36702. | 11979. | 0. | 0.38 | 0.32 |
| Q38  | AWP | LOST HILLS-KERN COUNTY      | CA | 36592. | 11946. | 0. | 0.38 | 0.32 |
| 016  | AWP | DOS PALOS                   | CA | 34714. | 11333. | 0. | 0.35 | 0.31 |
| CA06 | AWP | GARBerville                 | CA | 35569. | 10956. | 0. | 0.35 | 0.30 |
| Q68  | AWP | SCOTT VALLEY                | CA | 17851. | 25133. | 0. | 0.26 | 0.29 |
| L94  | AWP | MARIPOSA-YOSEMITE           | CA | 25737. | 14231. | 0. | 0.29 | 0.27 |
| MIT  | AWP | FANTASY HAVEN               | CA | 30095. | 9825.  | 0. | 0.30 | 0.27 |
| 301  | AWP | SHAFTER-KERN COUNTY         | CA | 29318. | 9570.  | 0. | 0.31 | 0.26 |
| Q61  | AWP | GUSTINE                     | CA | 29375. | 9588.  | 0. | 0.31 | 0.26 |
| 028  | AWP | GEORGETOWN                  | CA | 28723. | 9974.  | 0. | 0.30 | 0.26 |
| Q32  | AWP | ELLS FIELD-WILLIITS MUNI    | CA | 29934. | 9769.  | 0. | 0.31 | 0.26 |
| Q93  | AWP | GREAT WESTERN               | CA | 28815. | 9405.  | 0. | 0.30 | 0.25 |
| L05  | AWP | ENTERPRISE SKYPARK          | CA | 28219. | 9212.  | 0. | 0.28 | 0.25 |
| 365  | AWP | KERN VALLEY                 | CA | 20477. | 16329. | 0. | 0.25 | 0.24 |
| 010  | AWP | HAPPY CAMP                  | CA | 14718. | 19266. | 0. | 0.21 | 0.23 |
| Q86  | AWP | ALTA                        | CA | 26201. | 8551.  | 0. | 0.26 | 0.23 |
| Q72  | AWP | TRINITY CENTER              | CA | 24675. | 8053.  | 0. | 0.26 | 0.22 |
| L80  | AWP | HAYFORK                     | CA | 7358.  | 23771. | 0. | 0.15 | 0.21 |
| Q40  | AWP | HI DESERT                   | CA | 23476. | 7662.  | 0. | 0.23 | 0.21 |
| L72  | AWP | SUNSET SKYRANCH             | CA | 23458. | 7656.  | 0. | 0.23 | 0.21 |
| 014  | AWP | TURLOCK AIRPARK             | CA | 23553. | 7689.  | 0. | 0.25 | 0.21 |
| Q84  | AWP | MENDOTA                     | CA | 23568. | 7691.  | 0. | 0.23 | 0.21 |
| Q88  | AWP | PARADISE SKYPARK            | CA | 22548. | 7359.  | 0. | 0.24 | 0.20 |
| L22  | AWP | YUCCA VALLEY                | CA | 10999. | 18053. | 0. | 0.17 | 0.19 |
| L19  | AWP | WASCO-KERN COUNTY           | CA | 22061. | 7200.  | 0. | 0.23 | 0.19 |
| Q29  | AWP | PATTERSON                   | CA | 21219. | 6926.  | 0. | 0.21 | 0.19 |
| CLR  | AWP | CALIPATRIA MUNI             | CA | 21724. | 7092.  | 0. | 0.22 | 0.19 |
| Q97  | AWP | RICHVALE                    | CA | 20112. | 6566.  | 0. | 0.21 | 0.18 |
| Q33  | AWP | EUREKA MUNI                 | CA | 20715. | 6761.  | 0. | 0.21 | 0.18 |
| CRO  | AWP | CORCORAN                    | CA | 16786. | 5479.  | 0. | 0.18 | 0.15 |
| Q09  | AWP | ROUND VALLEY                | CA | 17033. | 5561.  | 0. | 0.18 | 0.15 |
| Q81  | AWP | TULELAKE MUNI               | CA | 16786. | 5479.  | 0. | 0.18 | 0.15 |
| Q95  | AWP | SHELTER COVE                | CA | 15160. | 5981.  | 0. | 0.16 | 0.14 |
| Q09  | AWP | SONOMA SKYPARK              | CA | 14131. | 5167.  | 0. | 0.14 | 0.13 |
| Q80  | AWP | LODI AIRPARK                | CA | 15229. | 4971.  | 0. | 0.15 | 0.13 |
| L68  | AWP | LAKE WOHLFORD RESORT        | CA | 13146. | 4292.  | 0. | 0.13 | 0.12 |
| L26  | AWP | HESPERIA AIR LODGE          | CA | 11784. | 3845.  | 0. | 0.12 | 0.10 |
| L18  | AWP | FALLBROOK COMMUNITY AIRPARK | CA | 10460. | 3415.  | 0. | 0.11 | 0.09 |
| L02  | AWP | SANTA SUSANA                | CA | 9460.  | 4309.  | 0. | 0.10 | 0.09 |
| Q97  | AWP | JENSEN FIELD                | CA | 8667.  | 2830.  | 0. | 0.09 | 0.08 |
| L17  | AWP | TAFT-KERN COUNTY            | CA | 9238.  | 3016.  | 0. | 0.09 | 0.08 |
| RZH  | AWP | QUARTZ HILL                 | CA | 8146.  | 2660.  | 0. | 0.09 | 0.07 |
| Q101 | AWP | ECKERT FIELD                | CA | 7603.  | 2482.  | 0. | 0.08 | 0.07 |
| Q21  | AWP | BROWNSVILLE                 | CA | 7328.  | 2392.  | 0. | 0.08 | 0.06 |
| 059  | AWP | CEDARVILLE                  | CA | 9860.  | 51495. | 0. | 0.29 | 0.41 |
| 023  | AWP | CHICO                       | CA | 25586. | 35155. | 0. | 0.35 | 0.40 |
| Q31  | AWP | DINUBA                      | CA | 44483. | 14521. | 0. | 0.47 | 0.39 |
| 060  | AWP | ROSAFOND                    | CA | 44492. | 14526. | 0. | 0.45 | 0.39 |
| Q96  | AWP | CLOVERDALE                  | CA | 35693. | 21295. | 0. | 0.41 | 0.38 |
| TNP  | AWP | SACRAMENTO                  | CA | 43447. | 14183. | 0. | 0.44 | 0.38 |
| L06  | AWP | TWENTYNINE PALMS            | CA | 41960. | 13695. | 0. | 0.44 | 0.37 |
| 020  | AWP | DEATH VALLEY NATL MONU      | CA | 32061. | 21708. | 0. | 0.37 | 0.36 |
| 002  | AWP | LODI                        | CA | 40420. | 13192. | 0. | 0.40 | 0.36 |
| Q07  | AWP | BECKMOURTH                  | CA | 28239. | 26115. | 0. | 0.36 | 0.36 |
| 026  | AWP | RANCHO MURIETA              | CA | 40838. | 13326. | 0. | 0.41 | 0.36 |
| Q04  | AWP | LONE PINE                   | CA | 14837. | 38582. | 0. | 0.27 | 0.35 |
| 203  | AWP | CORNING                     | CA | 28368. | 23721. | 0. | 0.35 | 0.35 |
| G46  | AWP | ANGWIN                      | CA | 36649. | 13086. | 0. | 0.39 | 0.33 |
| 015  | AWP | WEED                        | CA | 28644. | 20594. | 0. | 0.34 | 0.33 |
| L84  | AWP | TURLOCK                     | CA | 36702. | 11979. | 0. | 0.38 | 0.32 |
| Q38  | AWP | LOST HILLS                  | CA | 36592. | 11946. | 0. | 0.38 | 0.32 |
| 016  | AWP | DOS PALOS                   | CA | 34714. | 11333. | 0. | 0.35 | 0.31 |
| CA06 | AWP | GARBerville                 | CA | 35569. | 10956. | 0. | 0.35 | 0.30 |
| Q68  | AWP | FORT JONES                  | CA | 17851. | 25133. | 0. | 0.26 | 0.29 |
| L94  | AWP | MARIPOSA                    | CA | 25737. | 14231. | 0. | 0.29 | 0.27 |
| MIT  | AWP | TEHACHAPI                   | CA | 30095. | 9825.  | 0. | 0.30 | 0.27 |
| 301  | AWP | SHAFTER                     | CA | 29318. | 9570.  | 0. | 0.31 | 0.26 |
| Q61  | AWP | GUSTINE                     | CA | 29375. | 9588.  | 0. | 0.31 | 0.26 |
| 028  | AWP | GEORGETOWN                  | CA | 28723. | 9974.  | 0. | 0.30 | 0.26 |
| Q32  | AWP | WILLITS                     | CA | 29934. | 9769.  | 0. | 0.31 | 0.26 |
| Q93  | AWP | REEDLEY                     | CA | 28815. | 9405.  | 0. | 0.30 | 0.25 |
| L05  | AWP | KERNVILLE                   | CA | 28219. | 9212.  | 0. | 0.28 | 0.25 |
| 365  | AWP | HAPPY CAMP                  | CA | 20477. | 16329. | 0. | 0.25 | 0.24 |
| 010  | AWP | DINUBA                      | CA | 14718. | 19266. | 0. | 0.21 | 0.23 |
| Q86  | AWP | TRINITY CENTER              | CA | 26201. | 8551.  | 0. | 0.26 | 0.23 |
| Q72  | AWP | HAYFORK                     | CA | 24675. | 8053.  | 0. | 0.26 | 0.22 |
| L80  | AWP | JOSHUA TREE                 | CA | 7358.  | 23771. | 0. | 0.15 | 0.21 |
| Q40  | AWP | ELK GROVE                   | CA | 23476. | 7662.  | 0. | 0.23 | 0.21 |
| L72  | AWP | TRONA                       | CA | 23458. | 7656.  | 0. | 0.23 | 0.21 |
| 014  | AWP | TURLOCK                     | CA | 23553. | 7689.  | 0. | 0.25 | 0.21 |
| Q84  | AWP | MENDOTA                     | CA | 23568. | 7691.  | 0. | 0.23 | 0.21 |
| Q88  | AWP | PARADISE                    | CA | 22548. | 7359.  | 0. | 0.24 | 0.20 |
| L22  | AWP | YUCCA VALLEY                | CA | 10999. | 18053. | 0. | 0.17 | 0.19 |
| L19  | AWP | WASCO                       | CA | 22061. | 7200.  | 0. | 0.23 | 0.19 |
| Q29  | AWP | PATTERSON                   | CA | 21219. | 6926.  | 0. | 0.21 | 0.19 |
| CLR  | AWP | CALIPATRIA                  | CA | 21724. | 7092.  | 0. | 0.22 | 0.19 |
| Q97  | AWP | RICHVALE                    | CA | 20112. | 6566.  | 0. | 0.21 | 0.18 |
| Q33  | AWP | EUREKA                      | CA | 20715. | 6761.  | 0. | 0.21 | 0.18 |
| CRO  | AWP | CORCORAN                    | CA | 16786. | 5479.  | 0. | 0.18 | 0.15 |
| Q09  | AWP | COVELO                      | CA | 17033. | 5561.  | 0. | 0.18 | 0.15 |
| Q81  | AWP | TULELAKE                    | CA | 16786. | 5479.  | 0. | 0.18 | 0.15 |
| Q95  | AWP | SHELTER COVE                | CA | 15160. | 5981.  | 0. | 0.16 | 0.14 |
| Q09  | AWP | SONOMA                      | CA | 14131. | 5167.  | 0. | 0.14 | 0.13 |
| Q80  | AWP | LODI                        | CA | 15229. | 4971.  | 0. | 0.15 | 0.13 |
| L68  | AWP | ESCONDIDO                   | CA | 13146. | 4292.  | 0. | 0.13 | 0.12 |
| L26  | AWP | HESPERIA                    | CA | 11784. | 3845.  | 0. | 0.12 | 0.10 |
| L18  | AWP | FALLBROOK                   | CA | 10460. | 3415.  | 0. | 0.11 | 0.09 |
| L02  | AWP | SIMI VALLEY                 | CA | 9460.  | 4309.  | 0. | 0.10 | 0.09 |
| Q97  | AWP | SACRAMENTO                  | CA | 8667.  | 2830.  | 0. | 0.09 | 0.08 |
| L17  | AWP | TAFT                        | CA | 9238.  | 3016.  | 0. | 0.09 | 0.08 |
| RZH  | AWP | QUARTZ HILL                 | CA | 8146.  | 2660.  | 0. | 0.09 | 0.07 |
| Q101 | AWP | STRATHMORE                  | CA | 7603.  | 2482.  | 0. | 0.08 | 0.07 |
| Q21  | AWP | 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 | 1224.   | 399.    | 0.   | 0.01  | 0.01  |
| AWP | Q62 | 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 | WAIMEE-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 | UPU | 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 | L0L | 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  | 2055.   | 54862.  | 0.   | 0.21  | 0.38  |
| AWP | YAP | YAP                            | YAP ISLAND            | SP  | 2711.   | 51459.  | 0.   | 0.27  | 0.36  |
| AWP | ROR | BABELTHAUP/KOROR               | BABELTHAUP 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 (13.5X) AND PC (4.95X) 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 :0 PREDICT AIA'S WAS SUPPRESSED.

RECAP - FIGURE 34-A

| Region | State | Number of Sites With Phase II Benefit/Cost Ratios of |            |              |              |   |  | 2.00 or Greater | Total |    |
|--------|-------|------------------------------------------------------|------------|--------------|--------------|---|--|-----------------|-------|----|
|        |       | Less than .50                                        | .50 to .99 | 1.00 to 1.49 | 1.50 to 1.99 |   |  |                 |       |    |
| 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         |
|             |       | <u>207</u>    | <u>61</u>  | <u>31</u>    | <u>18</u>    | <u>51</u>       | <u>368</u> |
|             |       |               |            |              |              |                 |            |
| ASO         | AL    | 31            | 9          | 1            | 4            | 1               | 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         |
|             |       | <u>227</u>    | <u>89</u>  | <u>45</u>    | <u>27</u>    | <u>88</u>       | <u>476</u> |
|             |       |               |            |              |              |                 |            |
|             |       |               |            |              |              |                 |            |
|             |       |               |            |              |              |                 |            |
|             |       |               |            |              |              |                 |            |
| 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              | 86         |
|             | TX    | 154           | 39         | 13           | 9            | 38              | 253        |
|             |       | <u>268</u>    | <u>70</u>  | <u>42</u>    | <u>25</u>    | <u>74</u>       | <u>479</u> |
|             |       |               |            |              |              |                 |            |
| AWP         | AZ    | 24            | 15         | 6            | 4            | 6               | 55         |
|             | CA    | 76            | 41         | 22           | 14           | 33              | 186        |
|             | HI    | 2             | 6          | 0            | 0            | 2               | 10         |
|             | NV    | 5             | 7          | 4            | 3            | 1               | 20         |
|             | SP    | 6             | 4          | 0            | 0            | 0               | 10         |
|             |       | <u>113</u>    | <u>73</u>  | <u>32</u>    | <u>21</u>    | <u>42</u>       | <u>281</u> |
|             |       |               |            |              |              |                 |            |
| GRAND TOTAL |       | 1,651         | 589        | 290          | 195          | 586             | 3,311      |

1,071

FIGURE 34-B

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

| LOCID | AIRPORT NAME                            | CITY               | ST | LC<br>SAFETY<br>BENS | LC<br>EFFICY<br>BENS | GA+ML<br>AIA'S<br>YR 1 | PHASE<br>I B/C# | PHASE<br>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 | 969453.              | 268311.              | 741.                   | 5.23            | 8.22             |
| ANM   | 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 | 1151864.             | 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.                   | 2.70            | 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             |
| MAY   | MAYAGUEZ AIRFIELD                       | MAYAGUEZ           | PR | 207532.              | 139680.              | 142.                   | 0.69            | 2.31             |
| MZG   | 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                       | MARYSVILLE         | IL | 826841.              | 247738.              | 669.                   | 4.79            | 7.14             |
| MYA   | YUBA COUNTY                             | MARYSVILLE         | CA | 1033805.             | 253318.              | 911.                   | 6.65            | 8.55             |
| ONB   | OWENSBORO-DAVIESS COUNTY                | OWENSBORO          | KY | 767315.              | 234754.              | 680.                   | 5.18            | 6.66             |
| PAB   | 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                               | POHCE              | PR | 209297.              | 137780.              | 148.                   | 1.24            | 2.31             |
| PVM   | 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             |

|     | DADE-COLLIER TRAINING AND TRANSITION | MIAMI     | FL | 210605. | 38641.  | 129. | 0.96 | 1.66 |
|-----|--------------------------------------|-----------|----|---------|---------|------|------|------|
| TNT | PAGO PAGO INTL                       | PAGO PAGO | SP | 21813.  | 108600. | 61.  | 0.68 | 0.87 |
| TUT | TEXARKANA MUNI-WEBB FLD              | TEXARKANA | AR | 728486. | 227537. | 743. | 5.25 | 6.35 |
| TXK | VALDEZ NR 2                          | VALDEZ    | AK | 88810.  | 120234. | 63.  | 0.85 | 1.39 |
| VDZ | VALDOSTA MUNI                        | VALDOSTA  | GA | 678770. | 217985. | 525. | 4.16 | 5.96 |
| VLD | ENID WOODRING MUNI                   | ENID      | OK | 892061. | 252859. | 838. | 6.20 | 7.61 |
| WDG |                                      |           |    |         |         |      |      |      |

# 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 15

Sensitivity Analysis

|                                                                                    | <u>Airport With B/C Ratio Of:</u> |            |              |              |             | <u>Total Number of Qualifying</u>      |                                           |
|------------------------------------------------------------------------------------|-----------------------------------|------------|--------------|--------------|-------------|----------------------------------------|-------------------------------------------|
|                                                                                    | <u>.80</u>                        | <u>.90</u> | <u>1.00*</u> | <u>1.10*</u> | <u>1.20</u> | <u>Non-Towered/Non-Federal Towered</u> | <u>Civil Airports (B/C = 1.0 or more)</u> |
| <u>Life-Cycle Cost</u>                                                             |                                   |            |              |              |             |                                        |                                           |
| 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%)                                    |
| <u>Annual Benefit to</u><br><u>Air Carrier and Air</u><br><u>Taxi User Classes</u> |                                   |            |              |              |             |                                        |                                           |
| 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%)                                    |
| <u>Probability of Weather</u><br><u>Below VFR Minima</u>                           |                                   |            |              |              |             |                                        |                                           |
| 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%)                                    |
| <u>Value of a Statistical</u><br><u>Life</u>                                       |                                   |            |              |              |             |                                        |                                           |
| 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: |     |       |       |      | Total Number of Qualifying<br>Non-Towered/Non-Federal Towered<br>Civil Airports (B/C = 1.0 or more) |        |
|-------------------------------------------------------------|----------------------------|-----|-------|-------|------|-----------------------------------------------------------------------------------------------------|--------|
|                                                             | .80                        | .90 | 1.00* | 1.10* | 1.20 |                                                                                                     |        |
| <u>No. of Projected Annual</u>                              |                            |     |       |       |      |                                                                                                     |        |
| <u>GA Instrument Approaches</u>                             |                            |     |       |       |      |                                                                                                     |        |
| 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%) |
| <u>Probability of Averting</u>                              |                            |     |       |       |      |                                                                                                     |        |
| <u>a GA Wind-Related Accident</u>                           |                            |     |       |       |      |                                                                                                     |        |
| 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 x 10 <sup>-6</sup><br>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%) |
| <u>Probability of Averting</u>                              |                            |     |       |       |      |                                                                                                     |        |
| <u>a GA Ceiling/Visibility-<br/>Related Accident</u>        |                            |     |       |       |      |                                                                                                     |        |
| 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 x 10 <sup>-6</sup><br>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%) |
| <u>Probability of Weather</u>                               |                            |     |       |       |      |                                                                                                     |        |
| <u>Below IFR Minima</u>                                     |                            |     |       |       |      |                                                                                                     |        |
| 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      |                                    |
|--------------------------------|----------------------------|------------|--------------|--------------|-------------|---------------------------------|------------------------------------|
|                                | <u>.80</u>                 | <u>.90</u> | <u>1.00*</u> | <u>1.10*</u> | <u>1.20</u> | Non-Towered/Non-Federal Towered | Civil Airports (B/C = 1.0 or more) |
| <u>Probability of Averting</u> |                            |            |              |              |             |                                 |                                    |
| <u>an Instrument Flight</u>    |                            |            |              |              |             |                                 |                                    |
| <u>Disruption</u>              |                            |            |              |              |             |                                 |                                    |
| 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%)                             |
| <u>Proximity Penalty and</u>   |                            |            |              |              |             |                                 |                                    |
| <u>Remoteness Premium</u>      |                            |            |              |              |             |                                 |                                    |
| <u>(Applied to All Sites)</u>  |                            |            |              |              |             |                                 |                                    |
| 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%)                             |
| <u>Annual Aircraft</u>         |                            |            |              |              |             |                                 |                                    |
| <u>Operations</u>              |                            |            |              |              |             |                                 |                                    |
| 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 premiums 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<sup>1/</sup>

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

| "Modified"<br>Cause/<br>Factor <sup>2/</sup> | NTSB<br>File<br>No. | No. of Injuries |              |       |      | Degree of Aircraft Damage |             |       |    |
|----------------------------------------------|---------------------|-----------------|--------------|-------|------|---------------------------|-------------|-------|----|
|                                              |                     | Fatal           | Ser-<br>ious | Minor | None | Destroyed                 | Substantial | Minor | No |
| Unfavorable                                  | 0008                |                 |              |       | 1    |                           | X           |       |    |
| Winds or                                     | 0069                |                 |              |       | 2    |                           | X           |       |    |
| Wrong Runway                                 | 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           |       |    |

APPENDIX A-1 (Continued)

| "Modified"<br>Cause/<br>Factor <sup>2</sup> / | NTSB<br>File<br>No. | No. of Injuries |              |       |      | Degree of Aircraft Damage |             |       |      |
|-----------------------------------------------|---------------------|-----------------|--------------|-------|------|---------------------------|-------------|-------|------|
|                                               |                     | Fatal           | Ser-<br>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"<br>Cause/<br>Factor <sup>2/</sup> | NTSB<br>File<br>No. | No. of Injuries |              |       |      | Degree of Aircraft Damage |             |       |      |
|----------------------------------------------|---------------------|-----------------|--------------|-------|------|---------------------------|-------------|-------|------|
|                                              |                     | Fatal           | Ser-<br>ious | Minor | None | Destroyed                 | Substantial | Minor | None |
| Unfavorable                                  | 2412                |                 |              |       | 3    |                           | X           |       |      |
| Winds or                                     | 2440                |                 |              |       | 1    |                           | X           |       |      |
| Wrong Runway                                 | 2457                |                 |              |       | 1    |                           | X           |       |      |
| (Cont'd)                                     | 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                |                 |              |       |      | X                         |             |       |      |
| Subtotals                                    | 140                 | 2               | 1            | 30    | 200  | 15                        | 124         | 0     | 1    |
| Low Ceiling/                                 | 0091                |                 |              |       | 2    |                           | X           |       |      |
| Visibility:                                  | 0119                |                 |              |       | 5    |                           | X           |       |      |
| IFR Approach                                 | 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"<br>Cause/<br>Factor <sup>2</sup> / | NTSB<br>File<br>No. | No. of Injuries |              |       |      | Degree of Aircraft Damage |             |       |      |
|-----------------------------------------------|---------------------|-----------------|--------------|-------|------|---------------------------|-------------|-------|------|
|                                               |                     | Fatal           | Ser-<br>ious | Minor | None | Destroyed                 | Substantial | Minor | None |
| Low Ceiling/                                  | 2148                |                 |              |       | 4    |                           | X           |       |      |
| Visibility:                                   | 2423                |                 |              |       | 4    |                           | X           |       |      |
| IFR Approach                                  | 2595                |                 |              |       | 5    |                           | X           |       |      |
| (Cont'd)                                      | 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    |
| Thunder-                                      | 1700                |                 |              | 1     | 1    |                           | X           |       |      |
| storms                                        | 2591                |                 |              |       | 4    |                           | X           |       |      |
| Subtotals                                     | 2                   | 0               | 0            | 1     | 5    | 0                         | 2           | 0     | 0    |
| Temperature/                                  | 1376                |                 |              |       | 4    |                           | X           |       |      |
| Dew Point                                     | 1536                |                 |              | 2     |      |                           | X           |       |      |
|                                               | 1771                |                 |              | 2     |      |                           | X           |       |      |
|                                               | 3252                |                 |              |       | 2    |                           | X           |       |      |
|                                               | 3378                |                 |              |       | 1    |                           | X           |       |      |
| Subtotals                                     | 5                   | 0               | 0            | 4     | 7    | 0                         | 5           | 0     | 0    |
| Rain, Hydro-                                  | 1261                |                 | 2            |       |      | X                         |             |       |      |
| planning, or                                  | 2122                |                 |              |       | 8    |                           | X           |       |      |
| Wet Runway                                    | 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<sup>1/</sup>

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

| "Modified"<br>Cause/<br>Factor <sup>2/</sup> | NTSB<br>File<br>No. | No. of Injuries |              |       |      | Degree of Aircraft Damage |             |       | M |
|----------------------------------------------|---------------------|-----------------|--------------|-------|------|---------------------------|-------------|-------|---|
|                                              |                     | Fatal           | Ser-<br>ious | Minor | None | Destroyed                 | Substantial | Minor |   |
| 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            |       |      |                           | X           |       |   |
|                                              | 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"<br>Cause/<br>Factor <sup>2</sup> / | NTSB<br>File<br>No. | No. of Injuries |              |       |      | Degree of Aircraft Damage |             |       |    |
|-----------------------------------------------|---------------------|-----------------|--------------|-------|------|---------------------------|-------------|-------|----|
|                                               |                     | Fatal           | Ser-<br>ious | Minor | None | Destroyed                 | Substantial | Minor | No |
| Low Ceiling/<br>Visibility:<br>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                        | X<br>8      | 0     | 0  |
| Thunderstorms                                 | 3375                |                 |              |       | 1    |                           | X           |       |    |
| Subtotals                                     | 1                   | 0               | 0            | 0     | 1    | 0                         | X<br>1      | 0     | 0  |
| Temperature/<br>Dew Point                     | 2627                |                 |              |       | 4    |                           | X           |       |    |
|                                               | 3362                |                 |              |       | 2    |                           | X           |       |    |
| Subtotals                                     | 2                   | 0               | 0            | 0     | 6    | 0                         | X<br>2      | 0     | 0  |
| Rain, Hydro-<br>planing, or<br>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<br>Year Value/<br>\$530,000 (80\$) | Inflator Ratio<br>138.92/127.33/ | 1981 Value<br>\$ 580,000 <sup>4</sup> /           |
|-------------------------------------------------------------------------------------------------|-----------------------------------------|----------------------------------|---------------------------------------------------|
| Value of a Statistical Life                                                                     |                                         |                                  |                                                   |
| Unit Costs of Statistical Aviation Injuries:                                                    |                                         |                                  |                                                   |
| Serious                                                                                         | 38,000 (80\$)                           | See Footnote 5.                  | \$ 42,000                                         |
| Minor                                                                                           | 15,000 (80\$)                           | See Footnote 6.                  | 15,000                                            |
| Unit Replacement and Restoration Costs of General Aviation Aircraft (Excluding Turbojets/Fans): |                                         |                                  |                                                   |
| Replacement Restoration                                                                         | \$ 37,000 (78\$)<br>12,000 (78\$)       | 235.42/173.58/                   | \$ 50,000 <sup>2</sup> /<br>16,000 <sup>2</sup> / |
| Value of Time of Air Travelers Per Hour                                                         | 17.50 (80\$)                            | 138.92/127.33/                   | 19.00 <sup>10</sup> /                             |
| Variable Operating Costs of General Aviation Aircraft (Per Airborne Hour)                       | Fuel & Main-<br>Oil      Tenance        |                                  |                                                   |
| Single-engine piston, 1-3 seats                                                                 | \$ 9.93 + \$ 6.24 (78\$)                | See Footnote 11.                 | \$ 29.00 <sup>12</sup> /                          |
| Single-engine piston, 4 + seats                                                                 | \$ 12.41 + \$ 9.53 (78\$)               | See Footnote 11.                 | \$ 38.00 <sup>12</sup> /                          |
| Twin-engine piston, under 12,500 TOGW                                                           | \$ 25.12 + \$ 41.02 (78\$)              | See Footnote 13.                 | \$ 104.00 <sup>12</sup> /                         |
| Twin-engine turboprop, under 12,500 TOGW                                                        | \$ 54.61 + \$ 77.35 (78\$)              | See Footnote 14.                 | \$ 216.00 <sup>12</sup> /                         |
| Twin-engine turboprop, over 12,500 TOGW                                                         | \$198.25 + \$180.30 (78\$)              | See Footnote 14.                 | \$ 655.00 <sup>12</sup> /                         |
| Twin-engine turbojet/fan, under 20,000 TOGW                                                     | \$252.05 + \$162.28 (78\$)              | See Footnote 14.                 | \$ 748.00 <sup>12</sup> /                         |
| Twin-engine turbojet/fan, over 20,000 TOGW                                                      | \$354.10 + \$203.76 (78\$)              | See Footnote 14.                 | \$1,020.00 <sup>12</sup> /                        |
| Multi-engine turbojet/fan, over 20,000 TOGW                                                     | \$388.26 + \$461.22 (78\$)              | See Footnote 14.                 | \$1,421.00 <sup>12</sup> /                        |
| Piston rotorcraft                                                                               | \$ 13.73 + \$ 25.19 (78\$)              | See Footnote 13.                 | \$ 61.00 <sup>12</sup> /                          |
| Turbine rotorcraft                                                                              | \$ 22.44 + \$ 55.79 (78\$)              | See Footnote 14.                 | \$ 119.00 <sup>12</sup> /                         |
| Weighted Total                                                                                  |                                         |                                  | \$ 84.00 <sup>15</sup> /                          |

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.

```

0001 C THIS PROGRAM (DSN=AWOS.FORT) IS DESIGNED TO COMPUTE BATCH
0002 C BENEFIT/COST RATIOS FOR AUTOMATED WEATHER OBSERVING
0003 C SYSTEMS (AWOS) AT NON-TOWERED AND NON-FEDERAL TOWERED
0004 C AIRPORTS. WITH MINOR MODIFICATIONS, THIS PROGRAM CAN
0005 C ALSO BE APPLIED TO AIRPORTS DESIGNATED AS ATCT DISCON-
0006 C TINUANCE CANDIDATES. BENEFIT/COST LOGIC IS INCLUDED
0007 C FOR WIND, TEMPERATURE, DEW POINT, ALTIMETER, CEILING,
0008 C VISIBILITY AND LIQUID PRECIPITATION SENSORS. WHILE
0009 C THE BENEFIT/COST LOGIC FOR FREEZING PRECIPITATION AND
0010 C THUNDERSTORM SENSORS ARE ALSO INCLUDED, THEIR VALUES
0011 C ARE SUPPRESSED IN THIS PROGRAM APPLICATION.
0012 C
0013 C ALL DOLLAR VALUES IN THIS PROGRAM ARE 1981 DOLLARS.
0014 C
0015 C REAL LCC,MINOR,MIN,MLITN,MLLCL,INSBEN,MLAP,NUMER
0016 C DATA NINES/'9999'/
0017 C INTEGER Y,TOWRCD,SLOCID
0018 C REAL*8 STATE,REG
0019 C DIMENSION CITY(7)
0020 C
0021 C ----FE = FACILITIES AND EQUIPMENT COSTS UNIQUE TO EACH SENSOR:
0022 C WIND, TEMPERATURE/DEWPOINT, ALTIMETER, CEILING, VISIBILITY,
0023 C LIQUID PRECIPITATION, FREEZING PRECIPITATION AND THUNDER-
0024 C STORM. WHILE PREFEE = 3208 AND THUNFE = 20160, THEY
0025 C ARE SUPPRESSED IN THIS PROGRAM APPLICATION.
0026 C
0027 C WINDFE=1736.
0028 C TDPFE=1408.
0029 C ALTMFE=3456.
0030 C CEILFE=36433.
0031 C VISIFE=24808.
0032 C PRELFE=1192.
0033 C PREFEE=0.
0034 C THUNFE=0.
0035 C
0036 C ----OM = LIFE-CYCLE OPERATIONS AND MAINTENANCE COSTS UNIQUE
0037 C TO EACH SENSOR: WIND, TEMPERATURE/DEWPOINT, ALTIMETER,
0038 C CEILING, VISIBILITY, LIQUID PRECIPITATION, FREEZING
0039 C PRECIPITATION AND THUNDERSTORM. WHILE PREFOM = 479
0040 C AND THUNOM = 3015, THEY ARE SUPPRESSED IN THIS PROGRAM
0041 C APPLICATION.
0042 C
0043 C WINDOM=263.
0044 C TDPOM=207.
0045 C ALTMOM=518.
0046 C CEILOM=5448.
0047 C VISION=3709.
0048 C PRELOM=175.
0049 C PREFOM=0.
0050 C THUNOM=0.
0051 C
0052 C ----LC = LIFE-CYCLE COST UNIQUE TO EACH SENSOR: WIND,
0053 C

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C  TEMPERATURE/DEWPOINT, ALTIMETER, CEILING, VISIBILITY, LIQUID
C  PRECIPITATION, FREEZING PRECIPITATION AND THUNDERSTORM.
C

0022  WINDLC=WINDFE+WINDOM
0023  TPDPLC=TPDPFE+TPDPOM
0024  ALMLC=ALTMFE+ALINOM
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),AIITN(15),GAIN(15),MLITN(15),
      EGALCL(15),MLLCL(15),AP(15),GAAP(15),MLAP(15)

C
C  AIRPORT = AIRPORT NAME
C
0035  DIMENSION AIRPORT(11)

C
C  CRITICAL VALUES: VALUE OF A STATISTICAL
C  LIFE (VALLIF), UNIT COST OF A STATISTICAL SERIOUS INJURY
C  (CSTISIN), 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

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```

0036      C
0037      VALLIF=580000.
0038      CSTSIN=42000.
0039      CSIMIN=16000.
0040      DESTRY=50000.
0041      SUBDAM=16000.
          MINOR=8000.

0042      C
          PAIFD = PROBABILITY OF AVERTING A GA INSTRUMENT FLIGHT
          DISRUPTION (DECIMAL)
          C
          PAIFD=.10

0043      C
          CIFD = UNIT COST OF A GA INSTRUMENT FLIGHT DISRUPTION
          C
          CIFD=93.

0044      C
          FIA = FRACTION OF TOTAL GA ITINERANT OPERATIONS THAT ARE
          ARRIVALS (DECIMAL)
          C
          FIA=.50

0045      C
          FVC = FRACTION OF GA ITINERANT ARRIVALS CONDUCTED IN
          VISUAL CONDITIONS (DECIMAL)
          C
          FVC=.968

0046      C
          FO = FRACTION OF GA ITINERANT ARRIVALS THAT CAN
          BE EXPECTED TO OVERFLY IN THE ABSENCE OF A
          WEATHER OBSERVATION (DECIMAL)
          C
          FO=.195

0047      C
          CAO = UNIT COST OF AN OVERFLIGHT
          C
          CAO=.70

          QUAL = COUNTERS FOR NUMBER OF LOCATIONS HAVING
          PHASE II B/C RATIOS OF LESS THAN .50, .50 TO .99,
          1.00 TO 1.49, 1.50 TO 1.99, AND 2.00 OR GREATER.
          C
          QUALA=0.
          QUALB=0.
          QUALC=0.
          QUALD=0.
          QUALF=0.

0048      C
0049      LOCID AND SLOCID = LOCATION IDENTIFIER CODES FROM TAF
0050      AND SCI FILES, RESPECTIVELY. TOWERCD = TOWER CODE.
0051      PIFR AND RPIFR = PROBABILITY (%) OF WEATHER BELOW VFR MINIMA.
0052      PC AND RPC = PROBABILITY (%) OF WEATHER BELOW IFR MINIMA.
          TAF IDENT: DD DSN=FAA114.TAF80.FINAL.OCT1882.LOCID.DATA,
          00001080
          00001090
          00001100
          00001110
          00001120
          00001130
          00001140
          00001150
          00001160
          00001170
          00001180
          00001190
          00001200
          00001210
          00001220
          00001230
          00001240
          00001250
          00001260
          00001270
          00001280
          00001290
          00001300
          00001310
          00001320
          00001330
          00001340
          00001350
          00001360
          00001370
          00001380
          00001390
          00001400
          00001410
          00001420
          00001430
          00001440
          00001450
          00001460
          00001470
          00001480
          00001490
          00001500
          00001510
          00001520
          00001530
          00001540
          00001550
          00001560
          00001570
          00001580
          00001590

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FORTAN IV G1 RELEASE 2.0

MAIN

DATE = 83143

08/39/13

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0053 C UNIT=3400-4,VOL=SER=W54244,LABEL=(,NL),DISP=(OLD,KEEP),
0054 C DCB=(RECFM=F,LRECL=7420,BLKSIZE=7420,DEN=3)
0055 C SCI IDENT: DD DSN=FAA116.SAM.P341.VFRIFR.NONTWR.SCI.DATA,
0056 C DISP=SHR
0057 C
0058 C READ(10,10)SLOCID,RPIFR,RPC
10 FORMAT(A4,F5.2,1X,F5.2)
0059 C PRINT20
20 FORMAT('-',60X,'FIGURE 34-A')
0060 C PRINT30
30 FORMAT('-',28X,'RESULTS OF APPLYING CRITERIA TO ',
0061 C 'NON-TOWERED AND NON-FEDERAL TOWERED AIRPORTS')
0062 C PRINT40
40 FORMAT('-',95X,'LC',7X,'LC',4X,'GA+ML')
0063 C PRINT50
50 FORMAT(' ',93X,'SAFETY',3X,'EFFICY',2X,'AIAS',3X,
0064 C 'PHASE',3X,'PHASE')
0065 C PRINT60
60 FORMAT(' ',7X,'REG',3X,'LOC',6X,'AIRPORT NAME',3X,'CITY',
0066 C '19X','ST',5X,'BENS',5X,'BENS',3X,'YR 1',3X,'I B/C#',2X,
0067 C 'II B/C#')
0068 C PRINT70
70 FORMAT('-',)
0069 C 80 CONTINUE
0070 C BCI = PHASE I BENEFIT/COST RATIO. INITIALIZED AT 0.
0071 C BCI=0.
0072 C COUNT = SUM OF GA AND MILITARY ANNUAL INSTRUMENT
0073 C APPROACHES IN YEAR 1. INITIALIZED AT 0.
0074 C COUNT=0.
0075 C Y = EACH YEAR OF A SYSTEM'S ASSUMED USEFUL LIFE
0076 C OF 15 YEARS
0077 C Y=1.
0078 C COMBEN = ANNUAL BENEFIT TO EITHER THE AIR CARRIER
0079 C OR, REPEAT OR, AIR TAXI USER CLASSES. INITIALIZED AT 0.
0080 C COMBEN=0.
0081 C AIA- = PROJECTED ANNUAL INSTRUMENT APPROACHES OF GA
0082 C AND MILITARY USER CLASSES. INITIALIZED AT 0.
0083 C AIAG=0.
0084 C AIAM=0.
0085 C ANSAFB = GA AND MILITARY SAFETY BENEFITS IN YEAR Y.
0086 C INITIALIZED AT 0.
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0074      C      ANSAFB=0.
          C
          C      ANDELB = GA AND MILITARY FLIGHT DISRUPTION BENEFITS
          C      IN YEAR Y. INITIALIZED AT 0.
          C
          C      ANDELB=0.
          C
          C      ANDBEN = SUM OF ANSAFB AND ANDELB. INITIALIZED AT 0.
          C
          C      ANDBEN=0.
          C
          C      ---LCY = LIFE-CYCLE BENEFITS FOR EFFICIENCY (DELLCY),
          C      SAFETY (SAFLCY) AND TOTAL (TOTLCY). INITIALIZED AT 0.
          C
          C      DELLCY=0.
          C      SAFLCY=0.
          C      TOTLCY=0.
          C
          C      90 READ(11,100,END=260)REG,STATE,CITY,ARPORT,LOCID,TOWRCD,
          C      ZACITN,ATIIN,GAIN,GALCL,MLIIN,MLLCL,GAAP,MLAP,AP
          C      100 FORMAT(A5,A5,6A4,A2,10A4,A2,A4,10X,11,17(100X),92X,
          C      Z15F9.0,45X,15F9.0,45X,15F9.0,45X,15F9.0,45X,
          C      Z15F9.0,45X,15F9.0,9(100X),45X,15F9.0,45X,
          C      Z15F9.0,45X,15F9.0)
          C
          C      MIN = CONTROL FOR AVAILABILITY OF MINIMA FROM
          C      SCI DATA FILE: 0 = NO; 1 = YES.
          C
          C      MIN=1.
          C
          C      IF(TOWRCD.NE.0.AND.TOWRCD.NE.7.AND.TOWRCD.NE.9) GO TO 90
          C      110 IF(LOCID.LT.SLOCID) GO TO 130
          C      IF(LOCID.EQ.SLOCID) GO TO 140
          C      READ(10,10,END=120) SLOCID,RPIFR,RPC
          C      GO TO 110
          C      120 SLOCID=NINES
          C      GO TO 110
          C      130 CONTINUE
          C      MIN = 0.
          C      PIFR=13.5
          C      PC=4.95
          C      GO TO 150
          C      140 CONTINUE
          C      PIFR=RPIFR
          C      PC=RPC
          C
          C      TOTOPS = TOTAL AIRCRAFT OPERATIONS IN YEAR Y
          C
          C      150 TOTOPS=ACITN(Y)+ATIIN(Y)+GAIN(Y)+GALCL(Y)+MLIIN(Y)+MLLCL(Y)
          C      IF(TOTOPS.NE.0) GO TO 160
          C
          C      0002120
          C      0002130
          C      0002140
          C      0002150
          C      0002160
          C      0002170
          C      0002180
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C      INSBN = ANNUAL BENEFITS OF AVERTED GA AND MILITARY
C      INSTRUMENT FLIGHT DISRUPTIONS
C
0126      INSBN=(AIAG+AIAM)*PAIFD*CFID
C
C      VISBN=ANNUAL BENEFITS OF AVERTED GA AND MILITARY VISUAL
C      FLIGHT DISRUPTIONS
C
0127      VISBN=FIA*FVC*FO*CAO*((GAITN(Y)+MLLCL(Y))*((GALCL(Y)+
      ZMLLCL(Y))*6))
C
C      ANDELB = TOTAL EFFICIENCY BENEFITS
C
0128      ANDELB=COMBEN+INSBN+VISDN
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/DEN 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)))+(1.1575*(GALCL(1)+MLLCL
      Z(1)))
0136      TPDBEN=(.0025*(GAITN(1)+MLITN(1)))+(1.0015*(GALCL(1)+MLLCL
      Z(1)))
C
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)))+(1.0027*(GALCL(1)+MLLCL
      Z(1)))
C
0142      THNBEN=(.0007*(GAITN(1)+MLITN(1)))+(1.0004*(GALCL(1)+MLLCL
      Z(1)))
0143      THNBEN=0.
C
0144      BCI=((COMBEN*7.976)+((WINBEN+TPDBEN+ALTBEN+CLVBEN+PREBEN+

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0145      EIHNBEN)*14.5))*AR)/LCC
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      ZF5.0,1X,F5.2,'*',2X,F5.2,'*')
0158      WRITE(14,235)REG,LOCID,ARPORT,CITY,STATE,SAFLCY,DELLCY,COUNT,
0159      ZBCI,BCII
0159      235 FORMAT(A5,A4,10A4,A2,6A4,A2,A5,F8.0,1X,F5.0,F5.2,'*',F5.2,
0160      Z'')
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,
0164      ZF5.0,1X,F5.2,3X,F5.2)
0164      WRITE(14,255)REG,LOCID,ARPORT,CITY,STATE,SAFLCY,DELLCY,COUNT,
0165      ZBCI,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 ',
0177      Z' BENEFIT/COST RATIOS OF LESS THAN .50',5X,F5.0)
0177      PRINT320,QUALB
0178      320 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
0179      Z' BENEFIT/COST RATIOS FROM .50 TO .99',6X,F5.0)
0179      PRINT330,QUALC
0180      330 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
0181      Z' BENEFIT/COST RATIOS FROM 1.00 TO 1.49',4X,F5.0)
0182      PRINT340,QUALD
0182      340 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
0183      Z' BENEFIT/COST RATIOS FROM 1.50 TO 1.99',4X,F5.0)

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FORTRAN IV G1 RELEASE 2.0

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0183      PRINT350,QUALE
0184      350 FORMAT('0',25X,'TOTAL LOCATIONS HAVING PHASE II ',
0185           &' BENEFIT/COST RATIOS OF 2.00 OR GREATER',3X,F5.0)
0186      TOTAL = QUALA+QUALB+QUALC+QUALD+QUALE
0187      PRINT360,TOTAL
0188      360 FORMAT('0',25X,'TOTAL LOCATIONS',58X,F5.0)
0189      PRINT370
0190      370 FORMAT('0',8X,'# BENEFIT/COST RATIO BEFORE PROXIMITY PENALTY ',
0191           &' OR REMOTENESS PREMIUM IF ANY.')
0192      PRINT380
0193      380 FORMAT('0',7X,'# AIRPORTS WITH INSTRUMENT APPROACH PROCEDURES ',
0194           &' FOR WHICH GENERAL AVIATION AND MILITARY ANNUAL INSTRUMENT ',
0195           &' APPROACHES',11X,'(AIAS) WERE COMPUTED WITH THE SCI MODEL ',
0196           &' USING NATIONAL NORMS FOR PIFR (13.5%) AND PC (4.95%) ARE ',
0197           &' IDENTIFIED BY *./11X,'FOR OTHER AIRPORTS WITH INSTRUMENT ',
0198           &' APPROACH PROCEDURES AIAS WERE COMPUTED WITH THE SCI ',
0199           &' MODEL USING VALUES FOR PIFR')
0200      PRINT390
0201      390 FORMAT('0',10X,'AND PC BASED ON SITE-',
0202           &' SPECIFIC MINIMA IN THE SCI FILE. FOR AIRPORTS WITHOUT ',
0203           &' RECORDED AIAS IN THE TAF THE SCI MODEL',
0204           &' 11X,'USED TO REDICT AIAS WAS SUPPRESSED.')
0205      STOP
0206      END
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00004220  
00004230  
00004240  
00004250  
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00004390  
00004400  
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00004430  
00004440  
00004450

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