PRELIMINARY REVIEW
OF

# MAINTENANCE
# DETROIT METROPOLITAN WAYNE COUNTY AIRPORT

PREPARED FOR
THE JOINT LEGISLATIVE SELECT COMMITTEE
ON THE WAYNE COUNTY DETROIT METROPOLITAN AIRPORT

27-613-00L5

May 11, 2000

The Honorable Glenn D. Steil
Michigan Senate
Co-Chairperson, Joint Legislative Select Committee
1020 Farnum Building
Lansing, Michigan
and
The Honorable James L. Koetje
Michigan House of Representatives
Co-Chairperson, Joint Legislative Select Committee
N1093 House Office Building
Lansing, Michigan

Dear Senator Steil and Representative Koetje:

This is our special report on our preliminary review of Maintenance at the Detroit Metropolitan Wayne County Airport (the Airport). This report is in response to a request from the Joint Legislative Select Committee on the Wayne County Detroit Metropolitan Airport (the Committee) that we perform a preliminary review of the Airport.

The Committee identified seven general issue areas for us to consider in our preliminary review. This report on Airport maintenance addresses one of the seven issue areas.

This special report contains a background, purpose of report, overview of Airport maintenance, scope of preliminary review, comments, and various exhibits.

Our procedures were of limited scope. Therefore, our review should not be considered an audit in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States.

We are available to present this special report to the Committee upon request. If this is the Committee's desire or if you have any questions or concerns regarding this review, please contact me.

AUDITOR GENERAL

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*All exhibits of the Wayne County Detroit Metropolitan Airport Preliminary Review Reports are available by contacting the Office of the Auditor General in writing and specifying the exact exhibits that you would like to receive. Your written request, with your name and address, must be sent to: The Office of the Auditor General, 201 N. Washington Square, 6th Floor, Lansing, Michigan, 48913.

# PRELIMINARY REVIEW OF MAINTENANCE AT THE DETROIT METROPOLITAN WAYNE COUNTY AIRPORT

## BACKGROUND

In 1928, the Wayne County Airport was established pursuant to Act 182, P.A. 1927, which authorized political subdivisions, such as Wayne County, to acquire land for the operation of an airport. Renamed the Detroit-Wayne Major Airport in 1947 and the Detroit Metropolitan Wayne County Airport in 1958, the Airport today is operated under the authority of the Aeronautics Code of the State of Michigan (Sections 259.1 - 259.208 of the *Michigan Compiled Laws*). Section 259.126 of the *Michigan Compiled Laws* authorizes political subdivisions, such as Wayne County, to operate airports.

The Airport is served by all major domestic airlines and serves as a "hub" for Northwest Airlines, which operates 60 of the Airport's 103 aircraft gates. The Airport currently consists of three passenger terminals (one international terminal and two domestic terminals) as well as an on-site user-financed parking operation that is managed by a private contractor. The Airport presently has five runways (three north-south runways and two crosswind runways).

With the completion of the $10.8 million expansion to its Concourse A in November 1999, the Airport increased its number of aircraft gates to 103. In addition, the Airport and Northwest Airlines formulated an agreement in October 1996 to construct a new terminal complex, located southwest of the existing passenger terminal, called the Midfield Terminal Project. It includes a terminal building consisting of a terminal, a connecting link, an East Concourse with 66 jet aircraft gates, a passenger tunnel, and a West Concourse with 8 jet aircraft gates and 25 commuter aircraft gates; a new parking structure; an energy plant; a south entry road to the airport; a sixth runway, apron, and taxiways; and support facilities. The Midfield Terminal is scheduled for completion at the end of calendar year 2001.

## PURPOSE OF REPORT

This special report is in response to a request from the Joint Legislative Select Committee on the Wayne County Detroit Metropolitan Airport that we perform a preliminary review of the Airport. The Committee identified seven general issue areas for us to consider in our preliminary review. This report contains the results of our preliminary review covering the general issue area of maintenance.

## OVERVIEW OF AIRPORT MAINTENANCE

As of February 10, 2000, the Airport had 253 maintenance employees, which included 17 administrative employees, 85 field maintenance employees, 18 building maintenance employees, 28 equipment repair employees, 46 power plant employees, and 59 skilled trade employees (electricians, plumbers, carpenters, etc.). These employees provide maintenance for areas such as the power plant, the airfield, buildings, and equipment repair. Maintenance includes, for example, repairing or replacing restroom fixtures, doors, electrical outlets, lights and fixtures, air conditioning and heating units, and water pumps; mowing and repairing grass areas of the airfield; making and repairing signs; picking up litter; and cleaning storm drains. The airlines and concessionaires are responsible for maintenance in the gate/seating and concessionaire areas (see Exhibit A).

Airport maintenance expenditures for fiscal year 1997-98 totaled $28.3 million (20% of total Airport expenditures).

## SCOPE OF PRELIMINARY REVIEW

Our procedures were of limited scope. Therefore, our review should not be considered an audit in accordance with *Government Auditing Standards* issued by the Comptroller General of the United States.

We reviewed and performed limited testing on the Airport's maintenance procedures and controls for work orders, maintenance supplies, power plant, field maintenance

(including the 1998-99 snow removal plan), building maintenance, and equipment repair (including vehicle maintenance).

## COMMENTS

### Work Orders

**Background:**

Maintenance work is initiated by work order requests submitted to the Maintenance and Power Division. Emergency requests are communicated by a telephone call that is followed by a work order request. Requests are completed and submitted either by Airport employees on a nonrecoverable work order or by airline or concessionaire employees on a recoverable work order.

Nonrecoverable work orders submitted by Airport employees are requests for maintenance that is the Airport's responsibility (see Exhibit A). The Airport does not receive payment or reimbursement for nonrecoverable work orders.

Recoverable work orders are requests from an airline or a concessionaire for maintenance in an area that is the airline's or concessionaire's responsibility (see Exhibit A). The Airport receives reimbursement for work performed on a recoverable work order. Airport maintenance staff submit a bid to the airline or the concessionaire and, if accepted, perform the maintenance and bill for the maintenance provided.

The employee who originates the work order request assigns a numerical priority to the work order. The priority is based on established criteria (see Exhibit B).

A maintenance supervisor reviews the work order request and may seek clarification and/or adjust the priority as needed. For projects/alterations or critical projects, the work order needs to be approved by the Maintenance and Power Division director. The work order is then sent to the particular trade (electric, plumbing, carpentry, etc.) that is responsible for the type of maintenance required.

The trade supervisor is responsible for assigning maintenance personnel to the work orders. A crew or individual, as appropriate, will perform the needed maintenance.

**Procedure:**

We obtained and reviewed the Airport's procedures for processing both nonrecoverable and recoverable work orders.

**Comment:**

Airport records disclosed 740 outstanding nonrecoverable work orders (i.e., work not complete) as of November 1, 1999. Total days outstanding ranged from 1 day to 660 days.

The Airport responded that the normal backlog of outstanding work orders ranges from 350 to 1,000 work orders depending on the time of the year.

**Procedure:**

We obtained and reviewed a sample of 50 completed nonrecoverable work orders for the period May 7, 1999 through August 31, 1999 for proper documentation. Proper documentation included the name of the requesting entity, a statement of the problem, proper approvals, date requested, date assigned, total time charged, date completed, maintenance, supplies used, and total cost.

**Comment:**

Nonrecoverable work orders were generally documented as required. Three of the work orders were not completed within the allotted priority time frame.

Also, the Airport did not list maintenance supplies used on nonrecoverable work orders. The Airport did not consider listing maintenance supplies on nonrecoverable work orders as being cost effective.

**Procedure:**

We also obtained and reviewed the process for billing recoverable work orders to the airlines and concessionaires. We reviewed a sample of 7 completed recoverable work orders for the period September 1, 1998 through August 31,

1999 for proper documentation. Recoverable work orders required the same documentation as nonrecoverable work orders with the addition of the date billed.

**Comment:**

Recoverable work orders were generally documented as required. The length of time between the date that the work order was requested and the date that the work order was completed ranged from 1 to 35 days. The length of time between the date that work orders were completed and the date that they were billed ranged from 1 month to 6 months.

## Maintenance Supplies

**Background:**

The Airport maintains inventories of maintenance supplies that are stored in inventory cribs located in the power plant, field maintenance, building maintenance, and equipment repair areas. Maintenance supply inventories include such items as tires, paint, screws, bolts, plastic pipe, signs, and electrical fixtures and wire.

Maintenance supplies are requisitioned by maintenance personnel to fill work order needs. Replacement maintenance supplies are either purchased from the "county store" or through dollar-limited blanket purchase orders held with local businesses. The "county store" is a supply warehouse located in the county maintenance yard adjacent to the Airport.

The Airport expended $3.3 million on maintenance supplies in fiscal year 1997-98.

**Procedure:**

We requested the Airport's procedures for recording the receipt and disbursement of maintenance supplies and for conducting annual physical inventories in the areas of the power plant, field maintenance, building maintenance, and equipment repair.

**Comment:**

The Airport had only draft procedures that had not been promulgated. Our review of the draft procedures did not note any deficiencies.

**Procedure:**

We requested inventory records for the power plant, field maintenance, building maintenance, and equipment repair areas.

**Comment:**

The field maintenance and building maintenance areas did not maintain inventory records.

**Procedure:**

We requested records of annual physical inventories for the areas of the power plant, field maintenance, building maintenance, and equipment repair.

**Comment:**

None of the areas conducted annual physical inventories.

## Power Plant

**Background:**

The power plant area maintains the Airport heating and cooling systems and is comprised of two units, operations and maintenance.

The operations unit is responsible for responding to service calls, providing routine preventive maintenance on a monthly basis as required by procedure, and providing 24-hour dispatch.

The Maintenance unit provides support services, including repairs, heavy maintenance alterations, fabrication, and new installations.

**Procedure:**

We reviewed the power plant procedures and responsibilities.

**Comment:**

No deficiencies regarding the power plant procedures came to our attention during our review.

## Field Maintenance

**Background:**

The field maintenance area is responsible for outdoor facility maintenance runway snow removal and lawn care, and runway maintenance (such as runway painting and ramp sweeping).

From November 15 through April 15, field maintenance employees are expected to work the overtime required to effectively control snow and ice conditions on the runways, taxiways, ramps, and roadways.

Upon notification of the need for snow removal, the field maintenance manager will monitor and supervise the overall activities of the field maintenance area. The remainder of the maintenance personnel will be divided into two equal teams (primary and secondary) each consisting of a deputy manager, 4 foremen, and 29 maintenance workers and a third team consisting of 1 foreman and 4 maintenance workers. Each shift is 12 hours long. The day shift hours are 7:00 a.m. - 7:00 p.m. and the night shift hours are 7:00 p.m. - 7:00 a.m.

Whenever a 2-inch or more snowfall is predicted, the team whose shift covers that time period will be notified in advance to come to work at that approximate time and will be relieved by the following team on the above schedule. The third team works 3:00 p.m. - 11:00 p.m. and fills in on either the day or midnight shift as required. When advance notification is not possible, the field operations unit will notify the appropriate deputy manager to alert his team.

The equipment used for snow and ice control on runways and taxiways is utilized as follows:

a. Eight snow plows will be utilized immediately.

b. Depending on accumulated snowfall, 5 snow blowers will be placed in operation immediately.

c. Two runway brooms will clear 50 feet each side of the runway center line, as needed, after runways are plowed.

d. Two 3,500-gallon runway de-icer trucks will apply a potassium acetate based fluid.

e. Three runway sand spreader trucks will apply sand for 50 feet on each side of the runway.

The deputy manager is responsible for keeping a complete list of personnel phone numbers and will call in the personnel on his snow removal team. One deputy manager will direct primary snow removal operations and will verify that a runway is closed to all traffic before starting a snow removal operation. One deputy manager will direct secondary snow removal operations on the public side and coordinate support services provided by other departments or divisions.

Three foremen are assigned to the primary snow and ice control team. Two foremen will be in charge of the plows, blowers, and communication with the Federal Aviation Administration and Airport tower operations. The other foreman will be in charge of the chemical trucks, sand trucks, and communication with equipment repair to ensure that the equipment is brought back and repaired as quickly as possible. The chemical/sand truck foreman will handle "nil braking" (inability to brake) reports that might happen on one of the other runways. Another foreman will be assigned to the secondary snow and ice control team and be in charge of those areas and the assigned equipment.

Changes to equipment assignments may occur on a daily basis, depending on equipment or personnel availability. Assignments are made at the discretion of the on-duty Airport maintenance manager or the deputy manager and are based on assigning the best qualified Airport maintenance worker to operate the most critical equipment.

The airlines are responsible for clearing snow from the areas around the airplanes (see Exhibit C).

Currently, the Airport maintains approximately 73 pieces of snow-clearing equipment that includes snow plows, large and small snow blowers, sweepers, carriers, sand spreaders, chemical spreaders, snow plow/spreaders, graders, and snow brooms (see Exhibit D).

**Procedure:**

We reviewed the Airport's snow and ice control plan, which defines the duties and procedures for maintenance personnel to initiate when weather conditions outlined in the plan require action.

**Comment:**

The snow and ice control plan was revised in January 1999. The revision included the stationing of an operations manager in the Northwest Airlines Control Tower during snow removal operation, addition of a third crew for contractual snow removal, a ramp clearance schedule and map, and a change of order in the runway clearing schedule.

**Procedure:**

We obtained and reviewed pay rates of 22 field maintenance employees. We compared actual pay rates to the Wayne County pay plan.

**Comment:**

Of 22 field maintenance employees reviewed, 12 employees showed overtime earnings that were 25% or more of the employees' total pay (see Exhibit E).

The Airport responded that overtime is offered according to each union's current collective bargaining agreement and all classifications should work reasonable overtime. However, some employees refuse to work overtime leaving other employees the option to put in additional overtime.

Overtime expenditures for the field maintenance area totaled $1.6 million for fiscal year 1997-98.

**Procedure:**

We reviewed payments on a snow removal contract extension with the Jack B. Anglin Company, a private company, for loading and hauling snow to a disposal site located on Airport property for the period November 1998 through April 1999.

**Comment:**

Total Airport payments of $729,000 were within the contract maximum of $997,000.

**Procedure:**

We also reviewed payments to Torre & Bruglio, Inc. a private company (see Special Report on Competitive Bidding of Contracts, page 62) on a snow removal contract that occurred because of excessive snowfalls on January 7, 1999 and January 13, 1999.

**Comment:**

Total Airport payments of $154,000 equaled the contract maximum of $154,000.

## Building Maintenance

**Background:**

The building maintenance area is responsible for maintaining Airport buildings and coordinating the use of electricians, plumbers, carpenters, etc.

**Procedure:**

We reviewed the Airport's building maintenance responsibilities.

**Comment:**

The Airport is responsible for maintenance in the terminals. The airlines and concessionaires are responsible for the remaining areas (see Exhibit A).

**Procedure:**

We reviewed the Airport custodial contract payments to International Service Systems, a private custodial company.

**Comment:**

Custodial responsibilities are shared with the airlines and concessionaires (see Exhibit F). The 1998 contract payments totaled $4.2 million. There was no maximum contract amount.

## Equipment Repair

**Background:**

The equipment repair area is responsible for maintaining approximately 350 pieces of Airport equipment and vehicles (see Exhibit G).

Mechanics must be available during the implementation of the snow removal plan to make emergency repairs as needed. The equipment repair manager determines the number of personnel needed by evaluating the degree at which the snow plan is implemented. When conditions warrant a total snow removal operation, personnel are divided into two working crews, each working 12-hour shifts.

After each piece of equipment is used, the operator fills out a vehicle check list form that lists any problems encountered while operating the piece of equipment. The equipment repair manager evaluates the report and assigns a mechanic to correct the problems.

Equipment repair procedures require that, at the end of each snow season, all snow removal equipment be inspected and repairs scheduled. The procedures also require the mechanical inspection of all vehicles 30 days prior to the snow season.

**Procedure:**

We obtained and reviewed the Airport's procedures for maintaining equipment and vehicles.

**Comment:**

No deficiencies regarding the procedures for maintaining equipment and vehicles came to our attention during our review.

**Request for Information**

Since August 20, 1999, the Office of the Auditor General has been requesting various information from the Airport, including information on Airport maintenance. On January 25, 2000, we presented to the Joint Legislative Select Committee an itemized listing of outstanding requests for information that the Airport had not yet provided us. Pursuant to the Committee's January 25, 2000 motion, the Airport provided additional information which was incorporated into our draft report on Airport maintenance.

The draft report was shared with the Airport on April 14, 2000. In response, the Airport provided additional information regarding maintenance on May 2, 2000.

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# EXHIBITS

Exhibit B

# DETROIT METROPOLITAN WAYNE COUNTY AIRPORT

Work Order Priority Criteria

| Priority | Response | Description |
|---|---|---|
| 1 - Immediate attention | 0 - 3 days | Only safety/security related projects |
| 2 - Public inconvenience | 4 - 7 days | Work that will become "immediate attention" within 72 hours |
| 3 - Normal maintenance | 0 - 120 days | Routinely performed tasks |
| 4 - Projects/alterations | Notify within 14 days | Renovation, new installation, or fabrication |
| 5 - Critical projects | Notify within 14 days | Safety/security related projects |

Exhibit E

DETROIT METROPOLITAN WAYNE COUNTY AIRPORT

Sampled Maintenance Employees

With Overtime Pay Exceeding 25% of Total Pay

| Year | Employee | Overtime Pay | Total Pay | Overtime Pay as a Percentage of Total Pay |
|---|---|---|---|---|
| 1996 | A | $26,640.55 | $75,644.55 | 35% |
| 1997 | A | $26,136.68 | $75,887.07 | 34% |
| 1998 | A | $23,820.77 | $76,417.09 | 31% |
| 1996 | B | $19,863.21 | $69,475.29 | 29% |
| 1996 | C | $27,220.51 | $79,997.77 | 34% |
| 1997 | C | $35,669.89 | $90,810.14 | 39% |
| 1998 | C | $33,837.22 | $87,124.21 | 39% |
| 1996 | D | $17,529.65 | $62,594.39 | 28% |
| 1996 | E | $23,823.27 | $73,746.95 | 32% |
| 1998 | E | $18,034.56 | $73,362.87 | 25% |
| 1996 | F | $25,275.36 | $75,362.90 | 34% |
| 1998 | F | $19,814.69 | $73,409.43 | 27% |
| 1996 | G | $25,404.08 | $76,227.25 | 33% |
| 1998 | G | $20,744.00 | $74,370.43 | 28% |
| 1998 | H | $23,669.43 | $83,115.59 | 28% |
| 1998 | I | $26,873.53 | $82,767.69 | 32% |
| 1998 | J | $27,243.69 | $82,505.50 | 33% |
| 1998 | K | $25,616.20 | $79,265.82 | 32% |
| 1998 | L | $21,413.10 | $72,567.81 | 30% |