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NEEDS ASSESSMENT OF A MAJOR METROPOLITAN RELIEVER AIRPORT

David A. NewMyer
John A. Hamman
D. Scott Worrells
and
James R. Zimmer
Southern Illinois University at Carbondale

ABSTRACT

In November and December of 1994, investigators from Southern Illinois University, Carbondale, conducted a survey of based-users and transient-users of Palwaukee Municipal Airport of Wheeling, Illinois. Palwaukee is designated as a reliever airport by the Federal Aviation Administration and thereby eligible for federal funding. The purpose of the study was to determine user satisfaction with the airport, its services, and its facilities. The study appraised among other areas, whether or not and to what degree users were satisfied with Palwaukee and if they were considering a move to another location. The survey detailed user rationale for satisfaction and/or dissatisfaction with Palwaukee and the potential for relocation. The survey takes a comprehensive approach to identifying based-user and transient-user levels of satisfaction at Palwaukee. The full range of aircraft operators permanently based there as well as transient aircraft operators passing through were considered in the survey.

Generally the survey determined that based-users were satisfied with Palwaukee's facilities, services, and management. Responses were distinguished by types of aircraft operated. And, although not a majority in each area, significant numbers of based-users were found to be considering relocation.

Transient-users expressed satisfaction with the quality of fixed based operator services, facilities, and air traffic control. They expressed dissatisfaction with airport pavement, availability of parallel runways, and costs of fuel.

David NewMyer is Chairperson and Associate Professor in the Department of Aviation Management and Flight at Southern Illinois University, Carbondale. He received a Ph.D. in Education from SIUC and a M.S. in Transportation from Northwestern University.

John Hamman is an Associate Professor in the Department of Political Science (Public Administration program) at Southern Illinois University, Carbondale. He holds a Ph.D. in Political Science from the University of Illinois, Urbana/Champaign.

David Worrels is an Assistant Professor in the Department of Aviation Management and Flight at Southern Illinois University, Carbondale and holds a Master of Science degree in Aviation Management from Embry-Riddle Aeronautical University.

James Zimmer is the former airport manager for Cairo Municipal Airport, Illinois and is employed in the aviation insurance industry. He holds a Master of Public Administration (Aviation Administration) degree from Southern Illinois University, Carbondale.

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INTRODUCTION

Customer satisfaction is an increasingly important aspect of any service-oriented business. Due to serious questions being raised by airport users and by airport commission members, a survey of customer satisfaction at a general aviation airport was conducted in Illinois in 1994.

The Palwaukee Municipal Airport Commission (PMAC) contracted with Southern Illinois University, Carbondale (SIUC), to conduct a study of customer satisfaction at Palwaukee Municipal Airport, Wheeling-Prospect Heights, Illinois (PWK). Seven large general aviation airports in the Chicago region; Aurora, Dupage, Lake-in-the-Hills, Lansing, Lewis, Palwaukee, and Waukegan are Federal Aviation Administration (FAA) designated reliever airports. Each of these airports accommodate piston and jet aircraft for business and personal use. Of the seven, PWK is the closest to Chicago, just 18 miles to the northwest of downtown and only about seven miles north of O'Hare International Airport.

The purpose of this paper is to present the results of the customer satisfaction survey conducted by SIUC in late 1994. Thought to be the first of its kind, the survey covers both based-users and transient-users, and provides insights into the needs and wants of customers served by a large general aviation reliever airport. The survey itself was designed to assess the satisfaction of based-users and transient-users with PWK's services, facilities, and management. Future needs, from a service perspective, were also evaluated. In particular, the report gauges the extent to which airport clients were considering basing their aircraft at other regional airports and analyzes client rationale in considering relocation. The report first discusses study design and reports the major findings of two survey instruments. It then addresses issues upon which PWK customers exhibited strong satisfaction and those for which they shared much concern. Survey questions and responses are provided in Appendix A for based-users and Appendix B for transient-users. The report concludes by suggesting options for PMAC to consider in light of the findings.

General Aviation in the Reliever Airport Role

General aviation, basically every other type of aviation endeavor excluding scheduled passenger transportation, does not always fit cohesively with large commercial airport operations. The myriad services provided by general aviation operators, which is not totally inclusive of aerial photography, sky diving, air evacuation, corporate/executive transportation, air taxi, and charter, illustrate the need to separate commercial carriers and general aviation. Even though large corporate aircraft fit easily into the commercial carrier environment, their flexible schedules may cause perturbations to commercial airports' operations. Add in the full range of general aviation aircraft, single and multi-engine piston aircraft, single and multi-engine turbo-prop aircraft, corporate aircraft, and rotorcraft, and the scene becomes more complicated and far more

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difficult to manage efficiently and effectively. Since general aviation does not share any interdependent relationship with the major carriers or the regional/commuter airlines there is little justification to mix these incompatible operations. Safety is a paramount issue that must be taken into consideration as well. On June 23, 1998, a student pilot crashed and died on final approach to John Wayne International Airport in Orange County, California. Probable cause of the accident was wake turbulence generated by a Boeing 757 landing at the airport ahead of the student pilot (NTSB, 1998). Probably the worst example of mixing general aviation with major carrier operations occurred on September 25, 1978, at San Diego's Lindbergh Airport. A Pacific Southwest Airlines Boeing 727 collided with a Cessna 172. The crash killed the student pilot, his instructor, and everyone aboard the Pacific Southwest airliner (NTSB, 1979). Reliever airports are intended to resolve these operationally incompatible and potentially unsafe aircraft operations by providing a place for general aviation users to operate away from commercially serviced airports, but still have access to major metropolitan areas.

The United States Congress defines a reliever airport as one which relieves congestion at a commercial airport and provides general aviation access to the community (United States General Accounting Office [GAO], 1994). According to this GAO report, funding was allocated through the FAA's Airport Improvement Plan (AIP) to reliever airports meeting the following criteria.

> The airport should have at least 50 aircraft based at the airport or a minimum 35,000 annual operations (take-offs and landings). FAA may also name an airport a reliever if it determines that the airport is in a desirable location for instrument training activity. With FAA's concurrence, state and local planning authorities can designate an airport as a reliever even if it does not meet the above criteria. (1994, p. 3)

In 1994 there were 329 reliever airports designated by the FAA with 246 of these linked with a major commercial airport (GAO, 1994). Typically, linked relievers are located near a major metropolitan area's primary air carrier airport, are capable of handling corporate jets, have an instrument landing system (ILS) for all-weather operations, sell jet fuel, and have comprehensive general aviation services available for their customers (GAO, 1994). As is indicated by the GAO report the designation of a reliever can be quite broad and open to interpretation by the FAA, state, and local governments. Data suggests a moderate correlation among the criteria used to designate an airport as a reliever. With the exception of having an ILS, no more than two relievers illustrated have more than two qualifiers which are comparable. For example, VanNuys, California, and Deer Valley, Arizona, have similar runway lengths, comparable numbers of based aircraft, however annual operations and number of Fixed Base Operators (FBOs) vary widely. Hooks, Texas, and Teterboro, New Jersey, also have similar runway lengths and comparable numbers of based aircraft, here again annual operations and numbers of FBOs vary. Palwaukee, Illinois, with the shortest runway, rates fourth in annual operations, registers third in number of based aircraft, with the only comparable qualifier being the number of FBOs (see

Table 1). An indication that even nationally reliever airport size and facilities are just as diverse as the aircraft they service.

Table 1
Selected Reliever Airport Data - 1997

Reliever Airport	*Longest Runway*	*NAV Aides*	*Number of Annual Operations*	*Number of Based Aircraft*	*Number of FBOs*
Van Nuys, California (VNY)	8,000 x 150	ILS	583,170	715	5
Hooks, TX (DWH)	7000 x 100	ILS	146,870	291	1
Deer Valley, AZ (DVT)	8200 x 100	ILS	216,026	748	2
Teterboro, NJ (TEB)	7000 x 150	ILS	209,667	289	4
Palwaukee, IL (PWK)	5001 x 100	ILS	188,193	347	2

Note. Data were compiled from Santos, (1997, Airport Information).

Palwaukee Airport is an FAA designated reliever airport which serves a wide range of general aviation needs. Palwaukee is considered to be linked with Chicago's O'Hare International Airport. The diversity of services provided at PWK are directly proportional to the diversity of aircraft and operations conducted there. Fuel needs vary from MOGAS (automobile gasoline), to 100 Low Lead, to Jet A/B. Some aircraft owners/operators are satisfied with a simple tie-down, others require that their aircraft be hangared. Some owners/operators perform a majority of their own maintenance while others have a local FBO perform all of their maintenance.

According to Illinois Department of Transportation (IDOT) documentation Northeastern Illinois airport utilization has been stable from 1981 through 1994. There was virtually no change from 1981 through 1991. However, in 1992 PWK's share dropped from 22.8 percent to 18.5 percent, declining further in 1993 to 15.9 percent, and then increasing to about 17 percent in 1994 (IDOT, 1994). Figure 1 represents this data for the 10 year period 1985 through 1994. Additional IDOT data (by type of based aircraft) corroborated this trend. Since 1988, and particularly since 1991, based-user aircraft totals were down for single-engine, multi-engine, and jet aircraft at PWK (1994).

A comparison between IDOT official airport inventory data and inventory numbers reported by survey respondents draws a similar profile of the based-user population at PWK. Respondent and IDOT data indicate, when compared, that the majority of aircraft at PWK are single-engine, that multi-engine aircraft data deviates by five aircraft, jet aircraft data deviates by three aircraft, with rotorcraft data deviating by one aircraft (see Table 2). For the sake of comparison "jet" includes turbo-prop and turbo-jet/turbo-fan aircraft types.

Figure 1. Northeastern Illinois Airport Utilization.

Source: IDOT, 1994

%

Table 2
Number of Aircraft Based at PWK by Customers Responding to Based-user Survey Compared to 1994 IDOT Inventory

Type of Aircraft	*1994 Based-user Survey Results*	*1994 IDOT Inventory*
Single-engine	120	239
Multi-engine	34	39
Jet	54	57
Rotorcraft	3	2
Total	210	337

Note. Some respondents operate more than one aircraft. For the purposes of comparison jet is inclusive of turbo-prob, turbo-jet and turbo-fan aircraft.

METHODOLOGY

Between August and early November of 1994, SIUC investigators worked closely with PMAC in developing two survey instruments to study customer satisfaction with PWK facilities, services, and management. Each survey instrument addressed different perspectives from which based-user and transient-user customers utilized airport facilities and services. Survey instruments also accounted for types and numbers of aircraft operated by PWK based-users and transient-users (i.e., single-engine piston, multi-engine piston, turbo-prop, turbo-jet/turbo-fan, and rotorcraft) who responded to the surveys. It must be noted that Rotorcraft responses were included within turbo-jet/turbo-fan types of aircraft by their owner/operators.

Investigators mailed the based-user survey instrument to all PWK customers basing one or more aircraft at PWK as of November 14, 1994. The listing of based-users was supplied to investigators by PMAC. Investigators then mailed additional surveys on December 12, 1994 to customers not returning the initial survey. Over 160 based-user surveys were ultimately returned for a response rate of approximately 58 percent.

Three hundred transient-user survey instruments were mailed to customers selected at random from listings provided by Priester Aviation and Service Aviation, PWK's two FBO's (a total of 150 customers were selected from each of the two FBOs). The initial and follow-up mailings of the transient-user surveys took place in November and December 1994, respectively. Of three hundred transient-user customers surveyed, 121 of these (40 percent) responded.

The survey instruments solicited factual data about PWK's customers and their airport utilization such as what type of aircraft were flown, for what purpose, frequency of operations, and amount of fuel purchased at PWK and at other airports annually. The surveys also assessed current satisfaction with services, facilities, and management at PWK. Moreover, the survey asked customers about future needs at PWK.

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Most survey questions assessed attitudes and perceptions of customers regarding suitability of current facilities, services, and management and what they think the future holds for PWK. Consequently, questions were mostly close-ended and required based-users to relate the degree to which they were either satisfied or in agreement with statements about PWK facilities, services, and management. A five-point scale of 1 to 5 (where 1 is totally dissatisfied and 5 is extremely satisfied) identifies degree of respondent satisfaction or agreement. The surveys also included a few open-ended questions that let respondents volunteer additional comments about PWK facilities, services, and management in their own words. Appendix A and B include survey questions and responses. Responses are indicated by bold print. Responses for open-ended questions are not provided due to their variety and number.

Based-user Survey Results

The factual data, such as the type of aircraft flown, was not only useful for profiling customers based at PWK, but was extremely helpful in deciphering and pinning down assessments of facilities and services. For instance about 33 percent of based-user respondents used their aircraft for business, another 40 percent mostly for pleasure, and about 27 percent for business and pleasure. When these percentages are broken down by the types of aircraft based at PWK it was determined that 92 percent of customers basing turbo-jet aircraft at PWK flew mostly for business purposes, none of which flew mostly for pleasure, and only about 8 percent flew for business and pleasure. This contrasts sharply with single-engine, and multi-engine aircraft use. Of these two types of aircraft only about 13 percent of single-engine and 33 percent of multi-engine aircraft were flown mostly for business, while 56 percent of single-engine aircraft and 32 percent of multi-engine aircraft flew mostly for pleasure, and 30 percent and 33 percent flew mostly for business and pleasure, respectfully.

Different types of aircraft have different operational needs and serve different purposes. Survey results for aircraft utilization and fuel consumption indicated that turbo-prop, turbo-jet, and turbo-fan aircraft logged considerably more flight hours, consumed more fuel, and were far more likely to anticipate increasing their use of PWK over the next five years.

Satisfaction With Facilities

The survey asked based-users to respond to a series of close-ended questions concerning current availability and condition of runways/taxiways, storage and parking, and FBO' services.

Runways and Taxiways. Generally, based-user customers did not agree about the suitability of PWK's facilities. For instance, many respondents were satisfied, or extremely satisfied with runway width, availability of parallel taxiways, and condition of aviation pavements. However, just as many were less satisfied, neutral, or dissatisfied. Overall, based-users were satisfied with runway

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length. Over 56 percent indicated they were either satisfied with or extremely satisfied with current runway lengths at PWK.

Evaluations of runway length, width, and to a lesser extent, pavement condition differed by types of aircraft based at PWK. For instance, whereas over 70 percent of single-engine and 65 percent of multi-engine aircraft operators reported they were satisfied or extremely satisfied with length of runways, only 33 percent of the turbo-prop and 8 percent of turbo-jet/turbo-fan aircraft operators said they were satisfied.

Storage and Parking. There was a general lack of consensus about parking and storage availability. Responses were fairly evenly spread across all five types of aircraft owned/operated even though the answer most often given concerning parking availability was dissatisfied. Turbo-prop and turbo-jet customers were noticeably more satisfied with parking and storage space availability . About 66 percent of customers basing these types of aircraft said they were satisfied or extremely satisfied. Single and multi-engine customer responses of satisfaction were 31 percent and 39 percent, respectively. Turbo-prop and turbo-jet operators also tended to be more satisfied with the condition of parking and storage facilities than were customers operating other types of aircraft.

A clearer consensus existed among based-users in regard to parking and storage facility costs. Almost 64 percent said they were dissatisfied or totally dissatisfied with current prices. And, unlike previous concerns, type of aircraft made little difference in how customers responded.

Fixed Base Operators. The survey concluded by asking based-users about FBOs. Most were satisfied with facilities and services offered by both FBOs and all respondents disagreed that PWK needs more than two full-service FBOs.

Satisfaction With Services

There was considerably stronger consensus among based-user customers concerning their satisfaction with services at PWK than was the case with facilities. Based-users responses to questions related to fuel services, maintenance services, flight instruction, and management were solicited by the survey.

Fuel Services. Almost 75 percent of based-users said they were satisfied with availability and quality of ramp and fuel services. Only 26 percent were satisfied with fuel prices. However, fuel costs was considerably more a point of contention among those basing turbo-jet/turbo-fan aircraft at PWK. Only four percent of turbo-jet/turbo-fan aircraft operators responded that they were either satisfied or extremely satisfied with fuel prices. In contrast, almost 30 percent of single-engine and multi-engine based-users reported satisfaction with fuel prices.

Maintenance Services. Generally, based-users reported satisfaction with availability (46 percent) and quality (45 percent) of maintenance services at PWK. Again, cost was a major issue with 42 percent voicing dissatisfaction. However, turbo-prop customers (66 percent) and turbo-jet/turbo-fan customers (50 percent) were much more likely to be satisfied or extremely satisfied with

maintenance services than based-user owners/operators of single-engine and multi-engine aircraft at PWK. In total numbers of based-users only 20 percent expressed satisfaction or extreme satisfaction with maintenance services at PWK.

Flight Instruction. Based-user customers were largely supportive of the availability, quality, and cost of flight instruction at PWK. About half the respondents said they were satisfied or extremely satisfied and another 30 percent report neutrality. Although it was recognized that turbo-prop and turbo-jet/turbo-fan users reported neutrality about flight instruction, the strong satisfaction of single-engine and multi-engine customers was clear.

Management. A series of questions were asked to see how customers felt they were treated by management at PWK. Nearly 40 percent of based-users believed they were valued customers. Furthermore, almost 70 percent said that airport staff treat them with a great deal of respect. Also, 41 percent agreed they were listened to when voicing concerns to airport staff.

Airport Utilization

Respondents were asked to state how they used PWK and other major regional reliever airports in Northeastern Illinois. In general 41 percent reported they flew mostly for both business and pleasure. When asked why they based their aircraft at PWK the overwhelming response was PWK's convenient location. Frequently mentioned was quality of facilities and services.

A vast majority of based-users (76 percent) fly 250 or less operations at PWK annually although a few (4 percent) fly 1000 or more. Of the total number of these based-users 58 percent thought their airport utilization will remain the same over the next five years while 29 percent thought it would increase, and 9 percent predicted decreasing their utilization.

The survey also asked respondents to relate their use of other airports and their reasons for doing so. Waukegan Memorial was the most frequently used by 30 percent of respondents, followed by Dupage County Airport at 17 percent. Less than 10 percent of respondents mentioned Aurora Municipal Airport or Lake-in-the-Hills. Based-user respondents reported utilization of one of these locations almost four times a month on average. Based-users frequently mentioned better facilities, better services, less congested approach patterns, and convenient passenger pickup as rationale for using other airports. However, the greatest motivation for using other airports was less expensive fuel.

Changes and Improvements Desired by Based-users. After asking based-users about their current satisfaction with services, facilities, and management at PWK, they were asked to look ahead. Specifically, information was sought about the future at PWK and any related changes they thought ought to be made there. Again, close-ended questions were used that asked based-users to choose, from a 5-point scale, how much they agreed or disagreed with statements about changes that ought to be made at PWK. The survey was concluded with a few open-ended questions allowing respondents to offer comments about PWK

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facilities, services, and management in their own words. It should be noted that those responding to open-ended questions did not represent a majority of survey respondents as a whole. Responses were provided merely to help readers gain a feeling for the tone of responses.

Facilities. Clearly the most strongly felt need for PWK's future, among based-users, revolves around aircraft storage facilities. A little over 50 percent of based-users said they believed PWK needs more community and corporate hangars. Over 75 percent saw the need for more T-hangars and individual aircraft facilities as an integral factor to the future success of PWK. Of customers basing turbo-jet/turbo-fan aircraft most, over 75 percent, strongly feel the need for more corporate facilities. Based-user customers disagree that PWK ought to provide more tie-downs, obtain better highway access, or place a limit on numbers of aircraft based at the airport.

A total of 29 based-user customers volunteered additional comments about PWK facilities. The following quotes characterized their comments about taxiway conditions and runway characteristics. These quotes were typical of what customers who choose to respond to the open-ended questions related: "Need better taxiways", "Better taxiway surface conditions", "Better pavement on secondary runways used as taxiways", "A full length parallel taxiway for runway 16/24", and "Taxiways and ramps are tight in places." These comments were not necessarily representative of based-user customers and were largely critical. The same was true for the following quotations regarding storage and parking needs: "Covered tie-downs and T-Hangars", "New T-Hangars are BADLY needed", "More T-Hangars", and "More Hangars."

Services. There was general agreement among based-users that PWK does not need more than two full-service FBOs. Customers basing single-engine and multi-engine aircraft were much more in agreement on this issue than were turbo-prop and turbo-jet/turbo-fan operators. For instance, about 66 percent of customers basing turbo-prop aircraft and 50 percent of customers basing turbo-jet/turbo-fan aircraft agreed or strongly agreed that more FBO service was needed. Finally there was some agreement that PWK needs to provide better snow removal and security to protect aircraft. Customers basing turbo-jet/turbo-fan aircraft at PWK feel more strongly about these needs.

Management. Some customers choosing to respond to the open-ended questions also commented about management. The following quotations were typical of those remarks: "Management is too bureaucratic," "Management needs to LISTEN to their clients," and "Management needs to be more flexible."

Desirability of Other Regional Airports. The survey asked based-user customers about their use of other major regional airports in Northeastern Illinois and their rationale for doing so. Generally, based-users most often mentioned that they flew to Waukegan Memorial (30 percent), followed by Dupage County (17 percent). However, turbo-prop and turbo-jet/turbo-fan operators most frequently flew to Chicago Midway (42 and 67 percent respectively). Almost 40 percent of multi-engine operators said they flew most frequently to Dupage

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County. Customers gave numerous reasons for using these other airports including passenger pickup, less expensive fuel, less congested air space, and better facilities and services. Based-users utilized other airports about four times a month on average.

The survey concluded by asking based-users to indicate whether they were considering moving their aircraft to another regional airport. Fifty based-users (33 percent) said they were considering relocation. Based-users operating turbo-jet/turbo-fan aircraft were those most likely to be considering a move; 44 percent of the 25 turbo-jet/turbo-fan respondents were considering relocation (see Figure 2 and Table 3).

Figure 2. Based-users considering relocation.

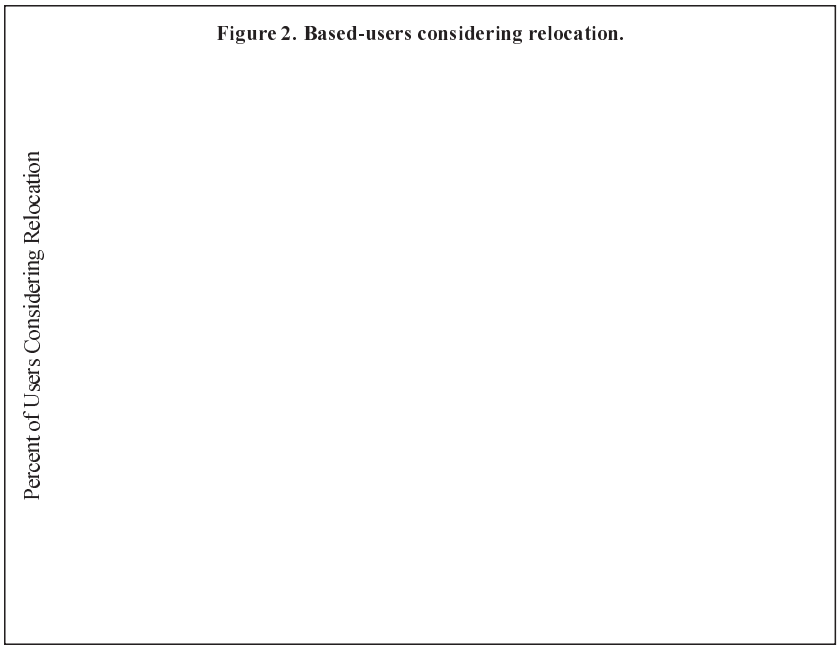

Table 3
Based-users Considering Relocation (by type of aircraft)

Type of Aircraft	*Number of Respondents*	*Number of Respondents Considering Relocation*	*Percentage of Respondents Considering Relocation*
Single-engine	93	28	30
Multi-engine	32	11	35
Turbo-prop	0	0	0
Turbo-jet/Turbo-fan	25	11	44
Total	150	50	33

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The survey asked those who were considering a move to explain in their own words why they were considering relocation. The following quotes were characteristic of their reasons: “Lower fuel costs”, “Better maintenance prices, fuel costs”, “Hangar facilities”, Better hangars at lower cost", and “Less expensive fuel and tie-down costs.”

TRANSIENT-USER SURVEY RESULTS

Like the based-user survey instrument, the transient-user survey instrument was designed to gauge customer satisfaction with facilities, services, and management at PWK. In this instrument questions were specifically crafted to assess transient-user satisfaction with airport facilities and FBO services, as well as to generally learn how transients utilize PWK.

Facilities, Services, and Management. Similar to based-user operators at PWK, satisfaction of transient-user customers with availability, condition, or cost of PWK facilities and services varied. What did stand out was that neutrality was the answer most often given. For instance, transient-users lacked conviction one way or another about PWK’s prices for fuel, parking, and storage. The majority of responses regarding PWK’s facilities and services, on balance, were more positive than negative. For instance, 43 percent of transient-users said they were either satisfied or extremely satisfied with length of runways. Almost 35 percent responded the same about width of runways. Transient-users also indicated that they were satisfied with Air Traffic Control (ATC) services and snow removal.

In contrast to the mostly positive responses by transient-users, airport pavement conditions and availability of parallel taxiways stood out as notable exceptions. Transient-users reported dissatisfaction with pavement conditions (42 percent) and dissatisfaction or extreme dissatisfaction with parallel taxiway availability (47 percent).

Transient-user satisfaction with FBOs’ facilities, services, and management was overwhelmingly positive. Over 70 percent of transient-users said they were satisfied, or extremely satisfied, with the quality and courtesy of FBOs’ services. Practically all transient-users responding to the survey said they would use the same FBO next time they flew into PWK.

Airport Utilization. The study identifies aircraft type and total number of aircraft operated by transient-users applying the same categories as the based-user survey. The 121 transient-user respondents flew a total of 307 operations per month into PWK (see Table 4). In contrast to based-users, the greatest percentage of transient-users flew mostly for business, followed by business and pleasure, and lastly pleasure alone.

A little more than half of the respondents said they conduct 25 or fewer annual operations while 16 percent said they conduct over 50 operations per year. About 68 percent said they expected to use PWK about as much over the next five years as they had this year. Another 25 percent said their utilization will

Table 4
Transient-user Operations at PWK (by Type of Aircraft)

Type of Aircraft	*Operations per Month*
Single-engine	103
Multi-engine	68
Turbo-prop	34
Turbo-jet & Turbo-fan	97
Rotorcraft	5
Total	307

increase, and less than 8 percent indicated a decrease in their utilization in the future.

CONCLUSION

Overall, conducting a customer satisfaction survey such as the one done for the PMAC is helpful in providing customer based input to the airport operator about a number of issues including:

1. Future capital investment needs,
2. Current airfield operational concerns,
3. Fuel costs,
4. Aircraft storage costs, and
5. Maintenance requirements.

Based on analysis of 160 based-user responses and 121 transient-user responses, customer satisfaction with Palwaukee Airport can be described as follows.

Based-users

Generally, based-users were most likely to express satisfaction about ATC services; length of runways, availability, quality, and cost of flight instruction; airport accessibility; availability of fuel; quality of ramp service; availability and quality of maintenance; and FBOs' customer service.

Most were likely to express dissatisfaction regarding costs of aircraft parking/storage; costs of maintenance, parts, and services; costs of aviation fuel; availability of hangars of all types; capacity for additional based-users; and security of aircraft.

Evaluation of data gathered from 50 based-users considering relocation categorized by aircraft type enables PMAC to focus on individual user-needs. Single-engine operators considering relocation expressed concern over matters of costs, availability, and condition of parking/storage; the availability of hangars of all types; the cost of maintenance, parts and service; and security of aircraft. Multi-engine operators considering relocation expressed concern over

matters of cost and availability of parking/storage; availability of hangars of all types; costs of aviation fuel; costs of maintenance, parts, and service; and security of aircraft.

There were no turbo-prop operators considering relocation. And finally, turbo-jet/turbo-fan operators considering relocation expressed concern over costs, availability, and condition of parking/storage; availability of community/corporate hangars; availability of taxiways suitable to aircraft operated; costs of fuel; snow removal; and security of aircraft.

Among those operators not considering relocation, single-engine operators expressed concern over costs of parking/storage, availability of T-hangars, and security of aircraft. Multi-engine operators not considering relocation were dissatisfied with costs of parking/storage and availability of hangars of all types. Turbo-prop operators, none of which indicated they were considering relocation, expressed concerns related to costs of parking/storage and numbers of full-service FBOs. Turbo-jet/turbo-fan operators not considering relocation were concerned with length of runways; availability of community/corporate hangars; costs of aviation fuel; and security.

Transient-users

The transient-user survey was constructed so as to provide data for PMAC to evaluate customer satisfaction by aircraft type. Those transient-users responding were most likely to express satisfaction with the quality of FBOs' services, facilities, and ATC services. They were most likely to express dissatisfaction with the condition of airport pavements, availability of parallel taxiways, and costs of aviation fuel obtained from FBOs.

RECOMMENDATIONS

Costs for storage and parking facilities was the major issue. It became clear in many situations that aircraft operators were concerned with the availability of hangar space. Investigators found that costs and availability of hangars was the primary reason that 33 percent of PWK's based-users were considering relocation.

Investigators recommend that PMAC determine the cost of comparable parking, storage, and hangar facilities at other airports and competitively adjust costs at PWK. Also, PMAC should study the feasibility of building more hangar facilities and find out the type most needed (i.e., T-hangar, corporate, etc.) based upon requirements of based-users considering relocation. An additional recommendation is that a forecast of future parking, storage, and hangar requirements be developed in the interest of attracting additional based-users.

Survey results indicated that customers at PWK were generally satisfied with the availability of FBOs' services, but costs related to fuel and maintenance were a concern. Investigators recommend that PMAC undertake a study of fuel and maintenance costs at the other airports in the Northeastern Illinois region

and determine how adjustments could make PWK more competitive and help increase user satisfaction.

With the impact of the General Aviation Revitalization Act of 1994 not fully being realized at this time the investigators further recommend that this study be expanded to include a random sample of reliever airports nationally. If what was found at PWK holds true for other relievers, in terms of the need for capital improvements (runways, taxiways, ramps as specified by AIP) there may be a better argument made for additional funding of reliever airport needs nationwide.

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APPENDIX A
Based Aircraft User Survey Questions

1. How many of each type of aircraft do you base at PWK?

Type	Number
Single Engine Piston	120
Multi Engine Piston	34
Turbo prop	8
Turbo jet/turbo fan	46
Rotor craft	3
Other (please specify)	0

2. How do you use your aircraft (Check one)?

32.3% Mostly Business
40.5% Mostly Pleasure
27.2% Business and Pleasure

3. Why did you choose to base your aircraft at PWK (please rank with 1 being the most important and 4 least important consideration)?

(raw scores)	1st	2nd	3rd	4th
1. Convenient location of PWK	69%	1%	1%	1%
2. Quality of PWK facilities	1%	21%	22%	6%
3. Quality of PWK services	1%	17%	22%	11%
4. Other, specify	1%	6%	1%	8%

4. How many annual operations (counting take-offs and landings separately) do you conduct at PWK?

38%	1 to 100	15%	251 to 500	1%	1001 to 2500
38%	101 to 250	4%	501 to 1000	3%	2501 or more

5. How many flight hours do you conduct per year in the aircraft you base at PWK (per aircraft)?

Mean = 278; Median = 150.

6. a. Estimate how many gallons of fuel you purchase annually at Palwaukee?

   Mean = 16,475; Median = 1,200.

   b. How many gallons of fuel a year do you purchase at other local airports?

   Mean = 7,960; Median = 500.

7. Are you expecting your use of PWK over the next five years to (check one):

   Increase 29% Decrease 9% Stay the same 58%

Next, we would like to begin by asking you to tell us how satisfied you are with PWK facilities and services.

8. Please indicate on a scale of 1 to 5 (where 1 is totally dissatisfied and 5 is extremely satisfied) how satisfied you are with the:

(Modal Choice ***Italicized***)	1	2	3	4	5
Length of runways	7.6	14.0	22.3	20.4	***35.7***
Width of runways	12.8	17.9	25.0	17.9	***26.3***
Availability of parallel taxiways	11.0	20.8	***32.5***	20.1	15.6
Condition of aviation pavements	18.5	17.2	***29.3***	25.5	9.6
FAA ATC services	5.2	7.1	14.9	***39.0***	33.8
Availability of aircraft parking/storage	***23.0***	21.1	17.1	19.7	19.1
Condition of aircraft parking/storage	19.9	14.7	***29.5***	19.9	16.0
Cost of aircraft parking/storage	***37.0***	26.6	18.2	11.7	6.5
Availability of flight instruction services	7.8	7.8	***30.0***	26.7	27.8
Quality of flight instruction services	5.7	8.0	***30.7***	28.4	27.3
Cost of flight instruction services	9.4	14.1	***38.8***	25.9	10.6
Pilot lounges	9.4	11.8	***33.9***	27.6	17.3
Airport restaurants	9.2	12.8	***36.2***	34.0	7.8
Lodging, Personal Security, & Safety	10.8	10.8	28.0	***30.1***	20.4
Airport accessibility by air	5.3	11.2	23.7	***30.9***	28.9
Airport accessibility by land	4.6	5.9	21.1	***38.8***	29.6
Fuel Availability	6.0	6.7	13.3	28.7	***45.3***
Quality of Ramp and Fuel Service	4.1	11.5	16.2	32.4	***35.8***

Continued — (Modal Choice ***Italicized***)	1	2	3	4	5
Cost of fuel	26.8	19.7	***27.4***	15.9	10.2
Availability of Aircraft Maintenance & Parts Service	6.8	11.5	***35.8***	29.7	16.2
Quality of Aircraft Maintenance & Parts Service	10.3	13.8	31.0	***31.7***	13.1
Cost of Aircraft Maintenance & Parts Service	22.6	19.2	***34.9***	15.8	7.5

9. We want to know if you are satisfied with the business and administrative practices at PWK. Please respond to the following statements (SD indicates you strongly disagree, D disagree, N no opinion, A agree and SA strongly agree).

(Modal Choice ***Italicized***)	SD	D	N	A	SA
I am valued as a customer at Palwaukee	12.7	22.2	25.9	***35.4***	3.8
Airport staff treats me with respect	3.8	8.9	17.8	***58.0***	11.5
Airport staff shares my concerns about issues that I have brought to their attention	13.0	13.6	32.5	***36.4***	4.5

We are very interested in finding out what changes you think ought to be made in PWK airport facilities and services in the upcoming years.

10. Please respond to the following statements (SD indicates you strongly disagree, D disagree, N no opinion, A agree and SA strongly agree).

(Modal Choice ***Italicized***)	SD	D	N	A	SA
PWK needs more community/ corporate hangars	1.3	7.8	***35.7***	33.8	21.4
PWK needs more T-hangars and/or single aircraft storage	1.3	5.1	17.9	28.8	***46.8***
PWK needs more than two full-service FBOs	12.2	***26.9***	21.8	18.6	20.5
PWK needs more tiedowns	3.3	19.0	***48.4***	19.6	9.8
PWK should place a limit on the number of based aircraft	***44.3***	31.0	18.4	5.7	0.6
PWK needs highway access	11.0	***43.5***	26.6	13.0	5.8
PWK needs better snow removal	5.3	28.3	26.3	***31.6***	8.6
PWK needs to provide better security measures to protect aircraft	1.3	21.4	20.8	***39.0***	17.5

11. What, if any, airport facilities and/or services do you think need improvement at PWK (use additional sheets as necessary)?

Finally, we would also like to ask you about your use of other airports.

12. Other than PWK, which airport in Northeastern Illinois do you use most often (check one):

4.5%	Aurora Municipal Airport	16.9%	DuPage County
8.4%	Campbell Airport	8.4%	Lake-in-the-Hills
9.1%	Chicago Midway	29.9%	Waukegan Memorial
Other	(Please specify)	22.7%	**Kenosha**

13. Please rank the following reasons for using this other facility (where 1 is the most important reason, 2 the second most important, and so on).

(raw scores)	1st	2nd	3rd	4th	5th	6th
Better facilities	15	13	4	5	3	1
Better Services	14	15	5	4	5	1
Ground facilities less crowded	2	9	10	9	9	0
Air approach less congested	15	7	6	5	6	2
Fuel is less expensive	21	12	9	4	2	4
Passenger Pickup	10	10	4	3	8	1
Other (please specify)	5	3	1	0	0	0

14. How frequently do you use this other airport (times per month)?

    Mean = 3.7; Median = 0

15. Are you actively considering moving your aircraft to another area facility?

    Yes 32.3% No 67.7%

    15a. If considering a move, which airport are you planning to move to?

    15b. Please tell us why you are considering this other airport:

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APPENDIX B
Transient Aircraft User Survey Questions

We would like to find out more about your use of PWK.

1. How many of each type of aircraft do you operate?

Type	Number
Single-Engine Piston	103
Multi-Engine Piston	68
Turbo-prop	34
Turbo-jet/turbo fan	97
Rotorcraft	5
Other (please specify)	0

2. How do you use your aircraft (Check one)?

75.2% Mostly Business
11.1% Mostly Pleasure
13.7% Business and Pleasure

3. Why did you choose to use PWK (please rank with 1 being the most important and 4 least important consideration)?

(raw scores)	1st	2nd	3rd	4th
1. Convenient location of PWK	68%	2%	0%	0%
2. Quality of PWK facilities	2%	16%	31%	6%
3. Quality of PWK services	2%	33%	18%	3%
4. Other, specify	4%	6%	9%	7%

4. How many annual operations (counting take-offs and landings separately) do you conduct at PWK?

55.8% 1 to 25
28.3% 26 to 50
15.8% 51 or more

5. a. Estimate how many gallons of fuel you purchase annually at Palwaukee?

Mean = 5041; Median = 525.

b. How many gallons of fuel a year do you purchase at other elsewhere?

Mean = 69,658; Median = 8050.

6. Are you expecting your use of PWK over the next five years to (check one):

   Increase 25.0% Decrease 7.5% Stay the same 67.5%

7. On a scale of 1 to 5 (where 1 is totally dissatisfied, 3 is neutral, and 5 is extremely satisfied) how satisfied are you with the:

(Modal Choice ***Italicized***)	1	2	3	4	5
Length of runways	12.6	18.5	***26.1***	22.7	20.2
Width of runways	16.8	21.8	***26.9***	21.8	12.6
Availability of parallel taxiways	19.7	27.4	***30.8***	15.4	6.8
Condition of aviation pavements	13.4	28.6	***40.3***	13.4	4.2
FAA ATC services	4.2	13.4	30.3	***40.3***	11.8
Snow Removal	0.0	11.9	***47.5***	29.7	10.9
Cost of FBO Fuel	8.5	24.6	***44.1***	19.5	3.4
Quality of FBO lounge facilities	5.9	11.0	31.4	***39.8***	11.9
Quality of FBO pilot briefing facilities	2.6	9.5	38.8	***39.7***	9.5
Quality of FBO restroom facilities	3.4	6.8	***39.8***	36.4	13.6
Quality of catering services	2.2	5.5	***51.6***	34.1	6.6
Availability of transient aircraft parking/storage	11.4	21.9	***33.3***	29.8	3.5
Condition of aircraft parking/storage	13.7	20.5	***37.6***	24.8	3.4
Cost of aircraft parking/storage facilities	11.1	18.8	***49.6***	16.2	4.3
Ease of access to aircraft parking/storage facilities	11.2	20.7	***33.6***	29.3	5.2
Quality of FBO service	2.6	6.0	20.5	***46.2***	24.8
Courtesy of FBO service	4.3	6.9	9.5	38.8	***40.5***

8. What changes, if any, would you like to see made in FBO services at PWK?

9. When you return to PWK, will you consider using the same FBO as last time?

   Yes 97.5% No 2.5%

   If not, why not?

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