



Erie International Airport

RUNWAY EXTENSION ECONOMIC ANALYSIS

PREPARED BY ECLAT CONSULTING, INC.
JULY 2007

**Erie International Airport
Runway Extension Economic Analysis**

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Erie International Airport Runway Extension Economic Analysis

1. Introduction

Erie International Airport's primary runway is 6,500 ft. long. The Airport Authority is seeking to extend the runway by 1,920 ft. The first 920 ft. extension is designated as a safety extension. For the 70% of the time when aircraft land and takeoff to the West, the 920 ft. extension would add no usable takeoff or landing runway length – and as a result, the usable length of the runway would remain at 6,500 ft. The additional 1,000 ft extension, which is the subject of this report, would increase the usable length of the runway to 7,500 ft., a length more commonly found at U.S. commercial service airports. The additional extension would provide Erie with the ability to accommodate aircraft that require a longer runway, creating the potential for new air service at Erie International and the economic benefits that result from new service.

Total cost of the full 1,920 ft. runway extension is estimated at \$65.3 million, divided into the \$45.8 million safety extension (the 920 ft. extension) and the \$19.5 million capacity extension (the additional 1,000 ft. extension). Funding sources for the safety extension have been identified. However, the FAA has indicated that it will fund only \$7 million of the \$19.5 million required for the capacity extension – with the remaining \$12.5 million to be funded from local/regional sources.

The purpose of this report is to evaluate the benefits of the proposed additional 1,000 ft. runway extension in comparison with its cost. Specifically, this report:

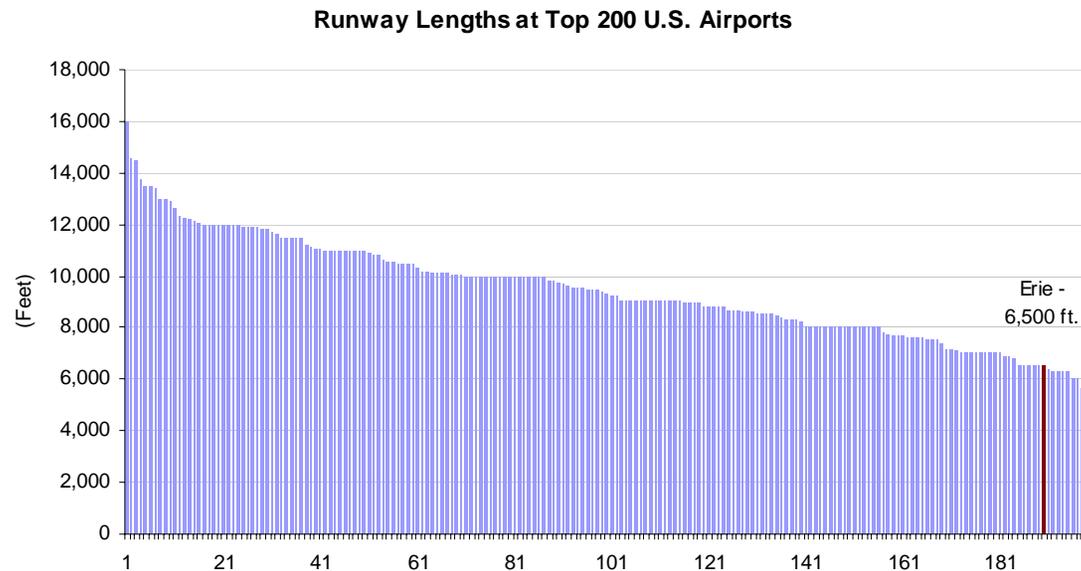
- Provides background information on how Erie's runway length compares to that of other commercial service airports, including those airports in most direct competition with Erie
- Identifies current known airline operating restrictions caused by the runway
- Identifies specific future passenger air service that Erie would be likely to attract if it could accommodate aircraft requiring a longer runway
- Identifies potential air cargo increases for Erie resulting from the runway extension
- Quantifies the economic benefits/costs associated with the air service restrictions and potential new air service. Both payback period and return on investment estimates are provided.

2. Erie's Runway Length – Comparison with Other Airports

Most U.S. commercial service airports have runways that are well in excess of 7,000 ft. As discussed in more detail, shorter runways cannot be used by the full range of regional jets and narrowbody aircraft without significant aircraft range and payload restrictions. This conclusion is common knowledge among pilots. For example, J. Randolph Babbitt, a veteran pilot and former head of the Air Line Pilots Association observed: “There is a major difference between a 6,500 ft. and a 7,500 ft. runway in terms of the ability to operate a fully-loaded aircraft over a longer range. A shorter runway will sacrifice either payload, passengers, or more distant destinations.”

Airports that have transoceanic flights, widebody aircraft, longer range flights, and some military flights typically have much longer runways, which also add an extra margin of safety.

The chart below shows how Erie's runway compares with the runway lengths at all 200 top U.S. commercial service airports. As illustrated, Erie's 6,500 ft. runway is among the shortest. In fact, only 10 airports, or 5% of the top 200, have shorter runways than Erie. (Only 20 airports, or 10% of the top 200, have runways shorter than 7,000 ft.). The average runway length exceeds 9,000 ft.



Extending the count of airports by another 50 to include airports with only 50,000 annual enplanements does not significantly change the results. (Erie had approximately 160,000 enplanements in 2006 and 190,000 in 2005). Only 18 out of 250 airports have runways that are shorter than Erie's. The average runway length remains above 9,000 ft.

Looking more closely at the few airports with short runways, they fall within two categories:

- Small airports served by turboprops or regional jets flying short distances
 - Examples: Key West, Lewiston, Ithaca, Charlottesville, Las Vegas North Terminal, San Luis Obispo, Hyannis, Salisbury, Lynchburg, New Bern, Nantucket, Traverse City, St. George
- Land-locked secondary airports in the nation's largest metropolitan areas – where the primary airports have unrestricted longer runways
 - Examples: Burbank, Orange County, Chicago Midway, Washington National, White Plains

As will be discussed further, Erie's air service needs cannot be fully met by turboprop and regional jet service. The economics of these types of aircraft, for example, do not permit low fare service which is offered at the nearby airports of Cleveland, Pittsburgh, and Buffalo. And Erie's current runway length imposes range restrictions even on the regional jet flights operated by network carriers such as Delta. With respect to the second category of exceptions, land-locked secondary airports, Erie does not have the luxury of having a primary airport with longer runways.

Erie's main airport competitors – Cleveland, Buffalo, and Pittsburgh – each have longer runways that permit unrestricted mainline nonstop service within the U.S. See table below. Erie's runway limitations, in comparison with neighboring airports, help limit its role to that of a secondary airport.

<u>Runway Lengths (ft.)</u>	
Erie	6,500
Buffalo	8,828
Cleveland	9,000
Pittsburgh	11,500

3. Runway Lengths – How Long a Runway is Necessary?

The Federal Aviation Administration recommends that airport planners determine runway length by considering the requirements of the most critical aircraft. FAA Advisory Circular 150-5325/4B, Runway Length Design. When Erie's runway extension was originally considered a number of years ago, Erie's then largest airline, US Airways, operated DC-9 aircraft and indicated that a runway length of 7,500 ft. was required for unconstrained operations on wet or icy runways. Since then, US Airways has removed the DC-9s from its fleet. However, Northwest Airlines, a major carrier at Erie, still operates DC-9 aircraft, as do some cargo carriers. More importantly, the MD-80 aircraft, a more modern aircraft derived from the DC-9, shares many of its operational characteristics and is operated by several airlines. Those airlines include Allegiant Air, a growing low fare airline that has expressed interest in serving Erie and has indicated that it is unable to do so because of Erie's short runway. As discussed below, other modern aircraft, including regional jets, also suffer operating restrictions as a result of the current short runway length.

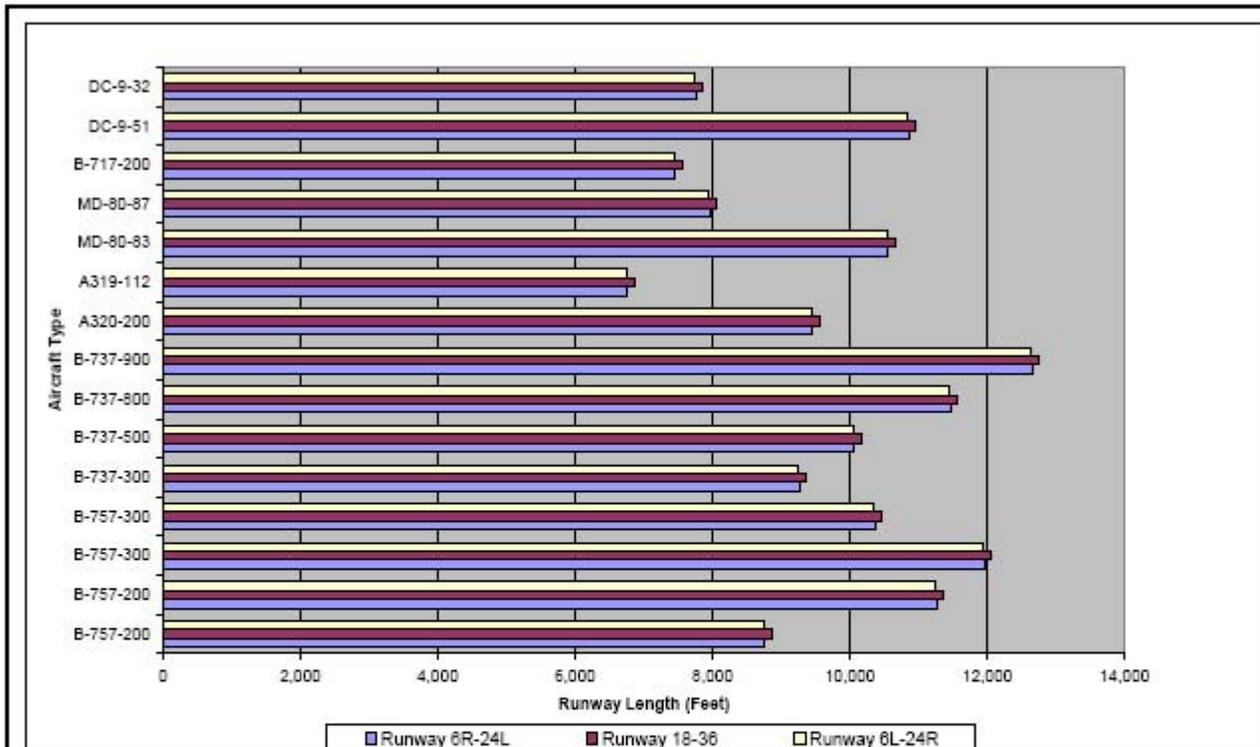
To provide a general sense of runway requirements for different aircraft types, the following two tables are provided, which are taken from a runway requirements analysis conducted for another airport. The information is illustrative only. As illustrated below, many narrowbody aircraft, except for the A-319 and B-717 require at least a 7,500 ft. runway to operate fully-loaded long range flights. In addition, based on ICAO standards (International Civil Aviation Organization), many regional jets require at least a 7,500 ft. runway to operate on an unrestricted basis.

Runway length requirements for each aircraft are determined by the aircraft manufacturer and vary depending on altitude, runway slope (gradient), temperature, and other factors. (Note that aircraft typically require greater runway lengths to depart than to land – and therefore runway lengths are determined based on aircraft takeoff length requirements.) In addition to the manufacturer's requirements, each airline will establish its own operational parameters, based upon the actual operating conditions at the airport and the airline's operating practices. With respect to the Erie runway, this report is not a substitute for a technical runway length analysis incorporating those factors, but instead is designed to summarize the known – not theoretical – aircraft limitations caused by Erie's short runway and to estimate their economic impact.

Note that letter of support for the Erie runway extension project has been submitted by four airlines/tour operators: US Airways, Northwest, Allegiant, and Apple. Given the very difficult economic circumstances most airlines face and the fact that a portion of the cost of any runway extension is typically reflected in increased landing fees paid by the airlines, the airline support for Erie's runway extension project is a good indicator that the project provides real economic benefits.

Dayton International Airport

Runway Length Requirements Analysis



- Notes:**
1. Mean daily high temperature of 85 degrees F and a pressure altitude of 1,009 feet yields a density altitude of approximately 3,000 feet.
 2. Runway lengths calculated based on specific aircraft manufacturers manuals for standard day temperature (15 degrees C) and adjusted for density altitude.

Source: Aircraft Characteristic Manuals
H:\DAY\Runway Length\Ray 6R Length Analysis_12-04.xls\9,500' RW 01/27/05



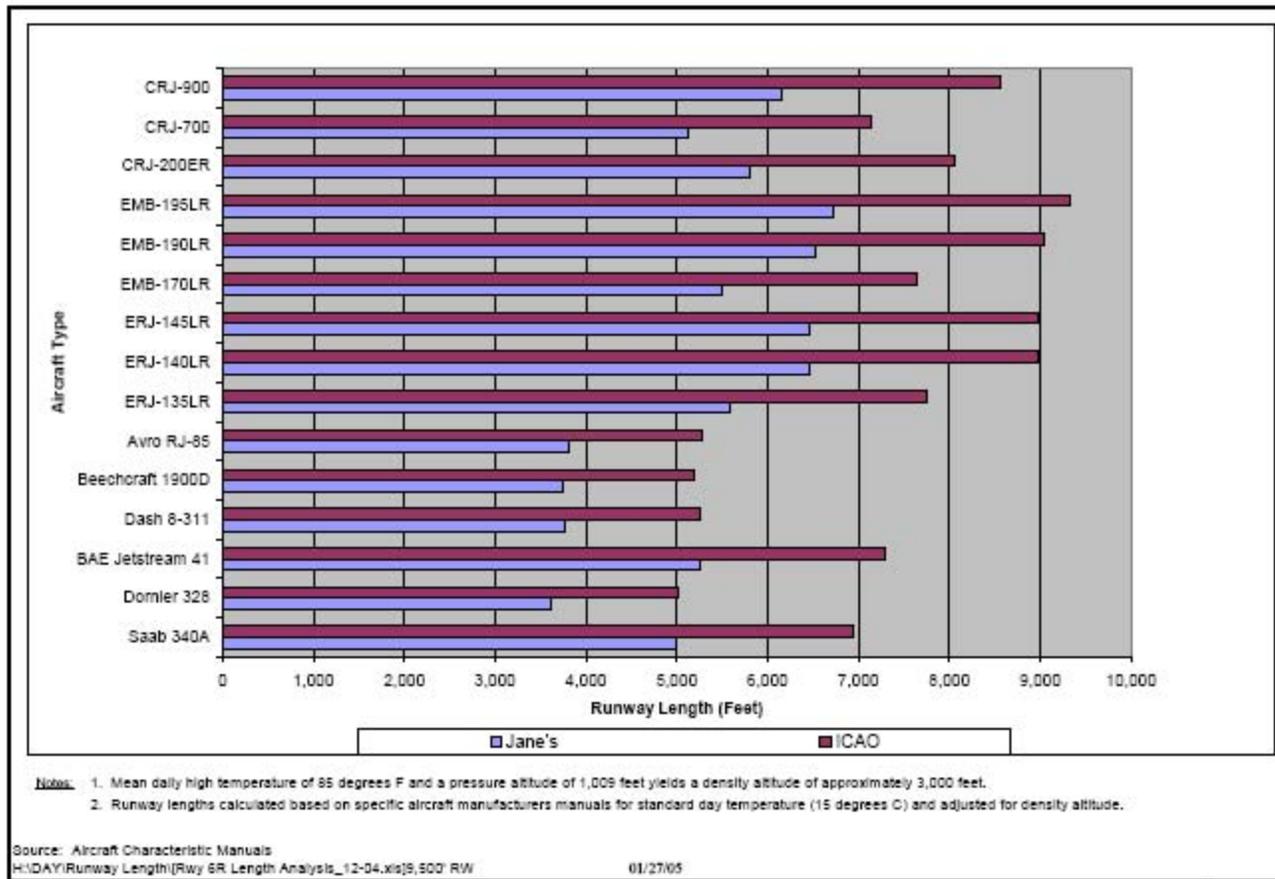
Dayton
International Airport

Runway Takeoff Length Requirements
Air Carrier Aircraft - 100% MTOW

Exhibit
1

Dayton International Airport

Runway Length Requirements Analysis



Dayton
International Airport

Runway Takeoff Length Requirements
Commuter Aircraft - 100% MTOW

Exhibit
2

4. Estimating Economic Impact

This report relies on a generally-accepted method of estimating the economic benefits associated with additional commercial aviation flights. The methodology and industry data inputs have been refined over the years as part of the frequently cited Bureau of Economic Analysis Regional Industrial Multiplier System (RIMS) II. The same economic model used for this study has been used at numerous other airports.¹

The model produces three separate measures of economic impact:

- The direct economic impact (in dollars) resulting from the new flights. Direct impacts include local expenditures at or near the airport by airlines, the airport operator, ground handling providers, and other firms involved in the provision of aviation services, as well as direct expenditures by visitors (at hotels, restaurants, shopping malls, etc.) who arrive in Erie via the new service.
- Total economic impact (in dollars) resulting from the new flights. The total impact includes: (1) the direct economic impact; and (2) a “multiplier effect.” An example of the multiplier effect is created when an airline employee spends his/her salary at a restaurant or hotel and thereby creates additional local employment and business revenue. The multiplier effect is also created when the hotel employee whose job is the result of visitor spending in turn spends his/her salary on goods and services thereby creating additional local employment and business revenue.
- The number of new jobs created as a result of the new flights.

¹ The FAA requires a separate economic analysis, called a BCA (Benefit-Cost Analysis), as part of its grant approval process. A BCA provides a different and much more limited measure of economic benefits than provided here. A BCA concentrates on airport-specific costs and benefits, and specifically excludes regional economic benefits, especially when those benefits may accrue to one region, such as Erie, at the expense of another region, such as Cleveland or Buffalo. Since the Erie runway extension is likely to result in exactly that type of benefit, FAA guidance requires that its impact be excluded from the BCA. In addition, the FAA excludes “consideration in BCAs of employment or output multipliers that ...measure the secondary effects of government expenditures.” “FAA Airport Benefit-Cost Analysis Guidance”, at 4. Ironically, however, the FAA not only acknowledges the regional economic importance of airports, but provides detailed guidance on estimating the economic impact of air service. See, e.g., “Estimating the Regional Economic Significance of Airports,” Butler and Kiernan, FAA, 1992 (prominently displayed on the FAA website). In summary, the Erie runway extension BCA is best viewed as a technical document that serves a different purpose than this economic analysis.

Economic impact studies conducted for a number of other airports were reviewed to determine appropriate metrics for the Erie market.² A conservative “multiplier” was selected for this study, which is easily defensible in relation to other studies. We expect the actual total economic impact of the proposed runway extension to exceed our estimates. Because the results of this analysis are important in determining the amount of funding warranted for the project, it is important that decision makers feel comfortable that the upside potential of the estimate exceeds any down-side risk. See Exhibit 1 for further explanation of methodology.

5. Impact on Current Passenger Airline Operations

Erie’s current runway length prevents some flights from operating at full capacity. A specific example comes from Delta Airlines, which operates two daily roundtrip Erie-Atlanta flights³ with 50 seat regional jet equipment.⁴ Delta has informed the airport that its Erie-Atlanta service incurs a penalty of 3 seats per flight during the summer months – June through August. What that means is that Delta can sell only 47 seats per flight rather than the 50 it should be able to sell. The reason the airline is incurring the seat penalty is that the runway is simply too short for the CRJ-200 aircraft used by Delta given the flight distance and higher summer temperatures. At 627 miles, Atlanta has the longest stage-length of Erie’s current nonstop services. However, that distance is still relatively short compared with the distance to other possible destinations.

The seat penalty becomes a factor only if Delta has to turn away potential passengers from these flights. Because Delta’s Erie – Atlanta service is new, there is no load factor history. However, the average load factor for all 50 seat jets in Delta’s Atlanta markets is a reasonable surrogate. To put Delta’s Atlanta performance in perspective, during the June-August peak traffic period in 2006, Delta averaged an 80% load factor on its 50 seat jets operating into and out-of Atlanta.

² Economic studies for the following airports and states were reviewed in setting the parameters for the Erie economic impact model: Tulsa, Dulles and National Airports, North Carolina Economic Impact Analysis, Newport News Airport (Virginia Study), Port Columbus, Rickenbacker International, Greenville-Spartanburg International, Ithaca Tompkins Regional, Huntington Tri-State, Telluride Regional Airport, Reno-Tahoe International Airport/Reno-Stead Airport, Williams Gateway, Lansing Capital City Airport, State of Arizona (All Aviation), State of Arizona (Commercial Aviation), State of Arizona (General Aviation), Colorado Public Use Airports, Denver International Airport, Colorado Springs Municipal, Nashville, State of Vermont, State of Virginia excluding Dulles/National, Hyannis Airport, Martha’s Vineyard, Nantucket Memorial, New Bedford Regional, Provincetown Municipal, Worcester Regional.

³ Except for one flight/day on Saturdays.

⁴ Note, this report was written just prior to Delta’s unexpected announcement that it would be terminating its Erie-Atlanta service on September 5, 2007 after serving the market for only three months. As explained in this report, the impact of Delta’s decision – based at least in part on operational restrictions caused by Erie’s short runway – will be far reaching in denying Erie residents access to connecting service at the world’s largest hub. Equally importantly, Delta’s decision makes it less likely that that other airlines will consider serving Erie with the same type of aircraft to their more distant hubs.

With load factors in the 80% range, it is estimated that approximately 25% of Delta's flights would be impacted by the seat penalty. As every traveler knows, some flight times and some days of the week are prone to especially full flights. With average load factors this high, there are many flights where Delta could sell some or all of the three seats it must now block for operational reasons. Assuming that the Erie-Atlanta service operates at an 80% load factor for the June-August 2007 period, the following table summarizes the potential revenue loss to Delta during the summer season as a result of the operational restrictions:

Missed sales	234
Average Fare	\$145
Lost revenue	\$33,930

The seat penalty affects the economics of Delta's current operation. It also affects Erie's growth potential. Summer is the peak travel time, and every lost sale diminishes the profitability of the route. As explained below, the \$34,000 of lost revenue for the three month period is more consequential than it first appears.

Delta's Atlanta hub is the largest in the world, and Delta's facilities in Atlanta are fully utilized. There is more demand for services into Atlanta than Delta can accommodate. Thus, from Delta's perspective, a route that is economically impaired by operational restrictions raises the question whether there are alternative routes without operational restrictions. These alternative routes become attractive options if their market demand is equal to or greater than Erie's. In terms of future growth, the same question applies. Why assign additional assets to an airport that has operational limitations impacting profitability when other unrestricted options exist?

From Erie's perspective, Atlanta is an extremely important connecting hub, and the loss of Erie-Atlanta service would be a major blow to Erie's air service development efforts. Prior to attracting the Atlanta service, Delta scheduled its Erie service into Cincinnati. The Cincinnati hub has since been scaled back as Delta went through its financial reorganization. As the world's largest hub, Atlanta offers Erie passengers a wide array of domestic and international connecting opportunities that simply are not available via Cincinnati.

The fact that Delta is incurring operational restrictions on its Atlanta service strongly suggests that other network carriers will also incur seat restrictions for new routes of equal or greater distance operated with 50-seat regional jets. In fact, both Northwest Airlines and US Airways have indicated that they have incurred operational penalties as a result of Erie's short runway. Northwest indicated that 88 passengers were denied boarding last year as a result of Erie's runway limitations. The company pointed out that there are other operational benefits of a longer runway that are difficult to quantify. These include the ability of Erie to serve as a "diversion" airport during bad weather. (See US Airways and Northwest letters attached as Exhibit 4 and 5.)

As the flight distance increases, the weight of the additional fuel required for the longer flight mean fewer seats can be sold to passengers. So the seat penalty would be greater for longer flights. And the 50-seat regional jet is a common aircraft type among other network carriers. As illustrated below, currently, all regional jet operations at Erie are conducted with this type of aircraft.

<u>Carrier</u>	<u>Aircraft</u>	<u>Aircraft type</u>	<u>Seats</u>
Continental	Beech-1900	turboprop	19
Delta	CRJ-200	regional jet	50
Northwest	CRJ-200	regional jet	50
	Saab-340	turboprop	34
US Airways	CRJ-200	regional jet	50
	Dash-8	turboprop	37

The 50-seat regional jet is the most likely aircraft type to be used by the network carriers for any new Erie service. The operation restrictions of the short runway pose a significant barrier to entry of many new routes as outlined in the following table. Of 14 potential network carrier hub markets listed below, eight of the 14 are farther than the 627 mile Erie-Atlanta segment. There is every reason to believe that new routes would also incur operational restrictions – a loss of seats available for sale. Needless to say, when airlines compare Erie’s restricted operation with other unencumbered options, the Erie service is likely to be at a disadvantage.

Hubs With/ Without Erie Service	Miles	Current Service
Phoenix	1,820	
Salt Lake City	1,640	
Denver	1,280	
Houston	1,190	
Dallas/Ft.Worth	1,120	
Miami	1,120	
Memphis	717	
Minneapolis/St.Paul	680	
Atlanta	627	√
Charlotte	476	
Chicago	396	
Newark	326	
Cincinnati	314	
Philadelphia	299	√
Washington-Dulles	259	
Detroit	162	√
Pittsburgh	110	√
Cleveland	97	√

6. Impact on Future Passenger Air Service

Erie faces significant challenges in its air service development efforts. Past studies have indicated over 65% of the air passengers in Erie's logical market area use other airports – primarily Cleveland, Buffalo and Pittsburgh – for their travel needs. Erie loses passengers to these other airports because they offer a wider array of services and more attractive fares. The recent efforts of the airport to persuade incumbent carriers to establish fares that compare favorably with those offered at nearby competing airports has reduced the number of Erie residents driving to other airports. However, passenger loss from the Erie market area to the nearby larger airports remains the most important challenge to Erie's air service development efforts.

The sections that follow analyze three sources of new passenger air service for Erie: (1) Potential new low fare service; (2) Potential new charter service; and (3) Potential new network carrier service. In each case, the available information demonstrates that Erie's ability to attract new service is being hindered by its short runway.

7. Potential New Low Fare Service

Many of Erie's price-sensitive leisure passengers drive to Cleveland, Buffalo, or Pittsburgh – each of which has service from major low fare carriers such as Southwest, jetBlue and/or AirTran. The Erie market is too small to be a candidate for service from any of these carriers in the near future. However, Erie is of interest to a successful, low fare carrier that focuses specifically on small/mid-sized markets such as Erie. That carrier is Allegiant Airlines, and its business model focuses on developing small markets with low fares and less than daily service. The low fares draw passengers from a very large area (a 2-hour drive is well within Allegiant's market area). And by concentrating the demand into less than daily service, Allegiant is able to operate profitably in markets that are too small for other low fare carriers who must schedule multiple daily flights in a market.

As the attached letter (Exhibit 2) indicates, there is significant interest on the part of Allegiant to serve Erie, but only if the runway is extended to over 7,000 feet. The lengthened runway would allow Erie to actively seek service from Allegiant Air, which serves three major leisure destinations – Orlando, Las Vegas and Tampa. The company operates MD-80 aircraft, and as noted in the letter, the current runway is simply not long enough to accommodate this aircraft type.

Allegiant would likely serve both Orlando and Tampa from Erie. Las Vegas is an equally attractive destination, but even with a longer runway, Allegiant's MD-80s do not have the range for this 1,910 mile flight. (The Eastern-most city on the Allegiant system with service to Las Vegas is Greenville/Spartanburg, South Carolina at 1840 miles. However, that airport has an 11,000 foot runway). Based on service patterns in cities of comparable size, it is likely that Allegiant would schedule 4 weekly flights to Orlando in the peak season, and 3 weekly flights to Tampa. During the off-peak season, Erie's Allegiant service to Orlando is likely to decline to 3 frequencies per week, and to 2 at Tampa.

Persuading Allegiant to serve Erie would be a major step in Erie's air service development efforts. The following table summarizes the economic impact associated with this service:

<u>Allegiant Air Economic Impact</u>	
Average Departures per Week	6
Operations per Year	626
Seats on Board	150
Load Factor	85%
O&D Passengers	79,779
Direct Economic Impact	\$ 5,983,393
Total Economic Impact	\$ 11,966,786
Direct Jobs	120
Total Jobs	239

The Allegiant service would be very important for Erie as it would consist entirely of leisure passengers who are currently traveling via Cleveland, Buffalo or Pittsburgh. These passengers would be “new” passengers for Erie – passengers who are making the trip because of the attractive fares and/or nonstop service from Erie. With Erie’s current service, few of these passengers are using the airport today and therefore, Allegiant’s service would not take passengers from incumbent Erie carriers. The 80,000 Allegiant passengers would be “in-addition-to” the current passengers using Erie International.

As indicated in the economic impact analysis summarized above, the new Allegiant service alone would have an annual regional economic impact of nearly \$12 million and would generate 239 new jobs. Thus this one new service would essentially pay for the local/regional share of the 1,000 ft. runway extension.

Note that the above economic impact only takes into account the additional regional spending and jobs created as a result of additional air travel at Erie. It does not take into account the separate economic benefit to Erie residents of being able to take advantage of lower airfares without having to drive 1-1/2 to 2-1/2 hours to do so.

8. Potential New Charter Service

The short runway also inhibits Erie's effort to secure charter service to attractive leisure destinations. The attached letter from Apple Vacations (Exhibit 3) indicates their interest in serving Erie and states that if the runway were lengthened to 7,500 feet, Apple would consider a weekly flight to Cancun and then, if that was successful, possibly a flight to the Dominican Republic.

Charter operators generally employ large aircraft like the Airbus A320 with 170 seats as mentioned in the Apple letter. Given the aircraft size and the length of the flight, that aircraft requires a longer runway.

As with the Allegiant service, the Apple charter flights would capture a segment of the market that is being lost to other airports today. Based on Apple's estimates, the company would offer a weekly flight to Cancun, averaging 150 passengers per trip. This would produce the following economic impact:

Apple Charter Economic Impact	
Average Departures per Week	1
Operations per Year	104
Seats on Board	170
Load Factor	88%
O&D Passengers	15,601
Direct Economic Impact	\$ 1,170,086
Total Economic Impact	\$ 2,340,171
Direct Jobs	23
Total Jobs	47

As noted in the letter, if the Cancun service proves as successful as forecast, Apple would consider a second charter to the Dominican Republic. Again, neither operation is possible today due to the inadequate runway length.

9. Potential New Network Carrier Service

Today, Erie receives service from four network carriers – Continental, Delta, Northwest and US Airways with nonstop service to the major hubs – Cleveland, Atlanta, Detroit, and Philadelphia. (US Airways also serves Pittsburgh.) If Erie is to continue to build its air service, it is important that these services succeed and form a platform for growth. The previously described operational restriction Delta is incurring on its Atlanta service (with 50 seat regional jet equipment) presents an obstacle to development that would be remedied with the lengthened runway.

The 50 seat regional jet is the equipment that would most likely be flown on any new Erie routes by network carriers. These carriers would direct Erie service to a hub to capitalize on the connecting opportunities afforded by the hub). And it is important that the carrier be able to operate without any operational restrictions that will diminish the economics of the route. Since many of the network carriers hubs that do not receive nonstop service from Erie are approximately the same or longer distances than Atlanta, the restrictions imposed by the short runway are a very real deterrent to future growth.

The following table outlines Erie’s current nonstop service, as well as the other major hubs of the network carriers. Also included is the mileage from Erie to those hubs since the longer stage lengths could present operational concerns.

<u>Carrier</u>	<u>Hubs Served</u>	<u>Miles</u>	<u>Other Hubs</u>	<u>Miles</u>
American	none		Chicago	396
			Dallas/Ft.Worth	1,120
			Miami	1,120
Continental	Cleveland	97	Houston	1,190
			Newark	326
Delta	Atlanta	627	Cincinnati	314
			Salt Lake City	1,640
Northwest	Detroit	162	Minneapolis/St.Paul	680
			Memphis	717
United	none		Chicago	396
			Denver	1,280
			Washington-Dulles	259
US Airways	Philadelphia	299	Charlotte	476
	Pittsburgh	110	Phoenix	1,820

The following table illustrates the economic impact of a single new service with 2 flights per day. If Erie is successful in attracting more than one new service from the network carriers, the impact(s) would be additive. With respect to the likelihood of attracting

additional network carrier service, the most difficult question is not whether Erie will attract such service (assuming the runway length restriction is removed), but when will the next service be added.

<u>Network Carrier Regional Jet Economic Impact</u>	
Average Departures per Week	14
Operations per Year	1460
Seats on Board	50
Load Factor	75%
O&D Passengers	54,750
Direct Economic Impact	\$ 4,106,250
Total Economic Impact	\$ 8,212,500
Direct Jobs	82
Total Jobs	164

10. Potential New Cargo Service

Today, Erie International’s scheduled air cargo activity consists entirely of service provided by FedEx. The service is flown with small turboprop equipment which is not hampered by the runway length. Additionally, carriers such as FedEx, UPS, and DHL have a wide variety of aircraft in their fleets which could be used for new or additional service to Erie using the current runway.

As Erie looks to the future, it has recognized the significant economic contribution that a strong cargo operation can make to the local economy. In terms of future cargo service, the runway-related issue for Erie is how to accommodate freighters. Most freighter aircraft operating with a full load require an extended runway beyond even the 7,500 ft. length. The following table lists the required runway lengths for fully loaded cargo aircraft:

Aircraft Type	Engine	Temp (F)	Takeoff Length
DC-30CF	CF6-50C	75	14,500
727-200 Standard or Advanced	JT8D-9	84	12,750
DC-10CF	CF6-6D1	75	12,500
DC-30CF	CF6-50C1	75	12,000
747-200F	CF6-50E2	86	11,350
727-200 Advanced	JT8D-15	84	11,250
747-200F	JT9D-7R4G2	86	10,900
MD-11F	CF6-80C2-B-1F	86	10,850
727-200 Advanced	JT8D-17	84	10,750
747-200SF	JT9D-7Q	86	10,550
727-200 Advanced	JT8D-17R	84	10,250
747-100SF	JT9D-7A	86	10,100
DC-8-73F	CFM56-2-C1	59	10,000
767-300 Freighter	RB211-524H	86	9,950
MD-11F	PW4460	86	9,800
777 Freighter	GE90-110B1L	86	9,800
MD-11F	CF6-80C2D1F	86	9,725
MD-11F	PW4462	86	9,460
747-400 Freighter	RB211-524G-T	86	9,350
767-300 Freighter	CF6-80C2B7F	86	9,300
747-400 Freighter	CF6-80C2-B1F	86	9,250
747-400 Freighter	PW4056	86	9,250
767-300 Freighter	PW4062	86	9,000
DC-8-71F	CFM56-2-C1	59	9,000
757-200 Freighter	PW2037	86	8,950
727-100, -100C	JT8D-7	84	8,750
727-200 Standard	JT8D-7	84	8,750
727-100, -100C	JT8D-9	84	8,250
757-200 Freighter	RB211-535E4	86	7,100

Source: Boeing

With the extended runway, Erie could handle a 757-200 freighter. As noted, the economic benefit associated with even a limited cargo operation is significant. With one weekly cargo flight with a 757-200 loaded to 75% capacity, the annual contribution to the Erie economy would be:

<u>Air Freight Economic Impact</u>	
Freight tons	3420
Direct Economic Impact	\$3,157,758
Total Economic Impact	\$6,315,516
Direct Jobs	12
Total Jobs	23

11. Summary of Economic Impacts

A summary of the economic impacts associated with each of the passenger service opportunities discussed in this report is provided in the table below.

Summary of Economic Impacts				
New or additional service from:	Direct Economic Impact	Total Economic Impact	Direct Jobs	Total Jobs
Allegiant	\$ 5,983,393	\$ 11,966,786	120	239
Charter Carrier	\$ 1,170,086	\$ 2,340,171	23	47
Network Carrier	\$ 4,106,250	\$ 8,212,500	82	164
Cargo	\$ 3,157,758	\$ 6,315,516	12	23
Total	\$ 14,417,487	\$ 28,834,973	237	473

If each opportunity were realized, the new services would result in at least \$28.8 million in annual economic benefits to the local Erie region, and the creation of a total of 473 new jobs. As explained previously, these results rely on a conservative economic impact model.

Actual results are likely to vary from those listed above because not all of the opportunities may be realized within a reasonable time frame. Some may take longer to be accomplished; some may not be accomplished at all. Others may exceed the expectations that have been described in this report.

Each of the new passenger service opportunities discussed in this report is believed to have at least a 50% likelihood of being realized within a short period after the completion of a runway extension. The likelihood of attracting new cargo service beyond that which could already be accommodated by the existing runway is believed to be lower – in the range of 10% to 30% by 2015. The table below lists the estimated probabilities for each scenario.

Estimated Probabilities of Obtaining New or Additional Service				
New or additional service from:	Time Frame	Likelihood		
		High	Low	Medium
Allegiant	2011	75%	40%	60%
Charter Carrier	2011-13	80%	50%	70%
Network Carrier	2011	60%	40%	50%
Cargo	2012-15	30%	10%	20%

Applying the estimated probabilities of each opportunity being realized to the economic impacts of each opportunity results in the following estimated impacts summary.

New or additional service from:	Estimated Probability (Medium)	Adjusted to Reflect Probability of Achieving			
		Direct Economic Impact	Total Economic Impact	Direct Jobs	Total Jobs
Allegiant	60%	\$ 3,590,036	\$ 7,180,072	72	143
Charter Carrier	70%	\$ 819,060	\$ 1,638,120	16	33
Network Carrier	50%	\$ 2,053,125	\$ 4,106,250	41	82
Cargo	20%	\$ 631,552	\$ 1,263,103	2	5
Total		\$ 7,093,773	\$ 14,187,545	132	263

As illustrated above, the estimated total *annual* economic impact of new air service that would occur if the runway extension is built exceeds the *total one-time contribution* to the runway project. Based on the direct economic impact alone, the project has less than a two-year payback. We note as well that the ongoing maintenance cost of the new 1,000 ft. runway extension have been estimated at approximately \$52,000 per year, and therefore is not a material factor in deciding whether to proceed with the extension.

Return on investment for the new runway, assuming a required investment of \$12.5 million and an annual return of \$14.188 million is 114%. The same return on investment calculation made on the basis of an annual economic return of \$7.09 million (which ignores the multiplier affect of the new air service) results in an ROI of 57%.

12. Conclusion

- Of the top 200 airports in the U.S., only 10 have runways that are shorter than Erie's. And those airports are either small airports served by turboprops or regional jets flying short distances, or land-locked secondary airports in the nation's largest metropolitan areas.
- Erie's current short runway imposes real constraints on current operations and measurable limits on Erie's air service development. Erie's air service needs cannot be fully met by turboprop and regional jet service. And Erie does not have the luxury of having another airport with a longer runway.
- Air service is competitive and Erie is at a disadvantage. Erie's main airport competitors – Cleveland, Buffalo, and Pittsburgh – each have longer runways that permit unrestricted mainline nonstop service within the U.S. Erie's runway limitations, in comparison with neighboring airports, help limit its role to that of a secondary airport.
- There is real interest in serving Erie by carriers who cannot do so today because of the short runway. Applying conservative economic impact model inputs and reasonable assumptions as to the probability of these new services occurring, the benefits of the new services clearly justify the cost of the 1,000 ft. runway extension.

Exhibit 1 – Economic Impact Methodology

Numerous studies have examined the impact of airport activity on local economies. Although the conclusions have varied, all studies have found a strong correlation between air passenger growth and local economic impact. As indicated in the report, economic impact studies typically have three components: direct economic impact; total economic impact; and jobs created.

Direct Economic Impact

Past studies have typically found that the direct economic impact per passenger falls into one of three ranges, depending on the type of travel, region of the world, and other factors.

Typical Economic Impacts of Airports

Per 1 million passengers

<u>Estimate</u>	<u>Economic Impact (mil)</u>
High	\$225
Medium	\$75
Low	\$35

Source: The Economic Benefits of Air Transport - 2000 Edition

This analysis uses the mid-range value (\$75) for the passengers from the new services. Passengers living in the Erie area and starting their trip from the airport may spend less than this figure, as their expenditures would be limited to items such as parking, concession items, the portion of their airfare that is spent on local airline expenditures, etc. However, passengers arriving at Erie would spend more than this figure as they would be spending for hotel, rental car, dining expenses, etc. Thus, the \$75 value is an average expenditure per departing and arriving passenger.

Total Economic Impact

This measure includes the direct economic impact plus induced impacts which are the economic impacts resulting from the “multiplier effect.” An example of the multiplier effect is created when an airline employee spends his/her salary at a restaurant or hotel and thereby creates additional business revenue and local employment.

Various studies on the economic impact of airports use a wide range of multipliers to calculate the total economic impact. The multipliers range from a high (for midsized airports) of 8.6⁵ to a low of 1.5 for a small West Virginia airport. In this study, a very conservative multiplier of 2.0 was used.

Jobs Created

Past studies have typically found that the number of jobs created per 1,000,000 passengers falls into one of three ranges, depending on the type of travel, region of the world, and other factors.

<u>Estimate</u>	<u>Typical Airport Economic Impact Studies</u>	
	<u>Jobs/1 million passengers</u>	
	<u>Direct</u>	<u>Total</u>
High	2,000	8,000
Medium	1,500	6,000
Low	750	2,500

Source: The Economic Benefits of Air Transport – 2000 Edition

The mid-range value of 1,500 direct jobs per 1 million passengers was used to estimate the number of jobs resulting from the airport's activity. The number of total jobs created, which would include jobs resulting from induced expenditures, in addition to the direct jobs, was based on a multiplier of 2. This multiplier is more conservative than used in most studies.

Cargo Economic Impact

A review of prior studies on the economic impact of cargo operations produced disparate results. For example, the direct impact ranged from a low of \$923 to a high of \$2,819 per freight ton. As with the passenger operations, the conservative estimate (\$923) was used to construct the direct economic impact stemming from a new cargo operation. A multiplier of 2.0, the same as for the passenger operations, was used to estimate the total impact from cargo operations.

⁵ The Economic Benefits of Air Transportation.