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DEREGULATION AND COMMUTER AIRLINE SAFETY

CLINTON V. OSTER, JR. AND C. KURT ZORN*

THE AIRLINE DEREGULATION ACT of 1978 (Deregulation Act) and the actions of the Civil Aeronautics Board (CAB) have led to the deregulation of a once highly regulated industry.¹ The goal of airline deregulation is to substitute competition among the airlines in place of government regulation as a means of achieving low fares and efficient service.² By liberalizing entry and exit restrictions,³ the Deregulation Act has made it easier for existing carriers to withdraw from markets they no longer wish to serve, and for both newly formed and existing carriers to enter new markets. Many feared that small communities would experience widespread service losses as major carriers adjusted to new freedoms and heightened competition by redeploying their jet aircraft to larger, denser and potentially more profitable markets.⁴ To counter these possible losses, the Deregulation Act guarantees "essential air transportation" to small communities for ten years following passage of the Act, and supports the guarantee with a subsidy program aimed

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¹ Airline Deregulation Act of 1978, Pub. L. No. 95-504, 92 Stat. 1705 (1978), *reprinted in* A. LOWENFELD, *AVIATION LAW* 545 (2d ed. Doc. Supp. 1981) (codified as amended in scattered sections of 49 U.S.C.) (amending the Federal Aviation Act of 1958, Pub. L. No. 85-726, 72 Stat. 737 (1958) (codified as amended at 49 U.S.C. § 1301 et seq (Supp. IV 1980))).

² Deregulation Act § 3, (codified at 49 U.S.C. § 102(a)(4) (Supp. IV 1980)).

³ *Id.* § § 10, 12, 19 (codified at 49 U.S.C. § 401(d)(5), (d)(7), (j)(2)).

⁴ J. Meyer, C. Oster, I. Morgan, B. Berman & D. Strassman, *AIRLINE DEREGULATION, THE EARLY EXPERIENCE* (1981) [hereinafter cited as *THE EARLY EXPERIENCE*].

specifically at commuter airlines.⁵

Deregulation relies heavily on commuter airlines to fill any voids left by the larger carriers after they terminate service to small communities.⁶ Commuters' smaller, propeller-driven aircraft are better suited to the short haul, low density routes typical of service to small communities. Commuter airlines, however, are commonly perceived as being far less safe than the jet carriers they are replacing.⁷ In recognition of this concern, the Deregulation Act clearly states that safety must have the "highest priority in air commerce, including specifically the prevention of any deterioration in the established level of safety."⁸ The Deregulation Act further directs the Federal Aviation Administration (FAA) to establish new standards of safety for commuters equal to those of certificated carriers, unless the FAA finds that the 1978 revision of commuter safety standards has achieved that result.⁹

A recent comment discussed the effect of Section 33 of the Deregulation Act on air service to small communities.¹⁰ The commentator concluded that some form of continued regulation will be needed, because small community service has been adversely affected both qualitatively and quantitatively by deregulation.¹¹ While other systematic analyses of small community service under deregulation have found a more favorable quantitative impact on such service,¹² scant analysis has been conducted on the quality of commuter service. There is little disagreement that commuters fly smaller, usually less comfortable aircraft offering few inflight amenities. Safety, however, is an important element of quality about which there is not widespread agreement.¹³

⁵ Deregulation Act § 33 (codified at 49 U.S.C. § 419(a) (Supp. IV 1980)).

⁶ THE EARLY EXPERIENCE, *supra* note 4, at 156-57.

⁷ *Id.* at 152-55.

⁸ Deregulation Act § 3 (codified at 49 U.S.C. § 102(a)(1), (2) (Supp. IV 1980)).

⁹ *Id.* § 33 (codified at 49 U.S.C. § 419 (Supp. IV 1980)).

¹⁰ Comment, *Section 419 of the Airline Deregulation Act: What Has Been the Effect On Air Service to Small Communities?*, 47 J. AIR L. & COM. 151 (1981).

¹¹ *Id.* at 170.

¹² Oster, *The Impact of Deregulation On Service to Small Communities*, 9 J. CONTEMPORARY BUS. 103 (1980).

¹³ For one viewpoint see Reingold, *Travelers' Advisory: The Commuters Are Coming*, 11

This article will analyze commuter airline safety and its implications for the growing role of commuters under deregulation. Through a comparison of the safety record of different segments of the commuter industry with that of jet carriers, the article will examine whether the increased role of commuter airlines is inherently inconsistent with the goal of maintaining the outstanding safety record of the domestic airline industry. As part of this assessment, the safety performance of the commuter industry between 1970 and 1980 will be examined with a focus on systematic differences among major subsets of the industry. The limited evidence regarding the impact of the 1978 revisions¹⁴ to commuter safety regulations will also be examined.

The analysis begins with a brief examination of the effect of deregulation on commuter growth and development. Next the safety performance of the commuter industry will be examined in detail. In conclusion, the analyses of growth and safety are brought together to assess the long range impact of deregulation on airline safety.

I. THE EFFECT OF DEREGULATION ON COMMUTER AIRLINES

Prior to deregulation commuter airlines had never been subject to CAB economic regulation so long as they operated aircraft below a specified size.¹⁵ Before 1972, commuter airlines were limited by CAB regulations to use of aircraft with a maximum gross takeoff weight of 12,500 pounds.¹⁶ That limit, coupled with safety regulations requiring a flight attendant for aircraft with 20 or more passenger seats,¹⁷ effectively constrained commuters to 19-passenger aircraft. In

WASHINGTON MONTHLY 56-7 (1979) and Kaus, *The Dark Side of Deregulation*, 11 WASHINGTON MONTHLY 33-40 (1979), and for an opposing viewpoint see Oster and Zorn, *Airline Deregulation, Commuter Safety, and Regional Air Transportation* 3-11 GROWTH AND CHANGE 14 (1983).

¹⁴ 14 C.F.R. § 135 (1980).

¹⁵ There were, however, some minimal data reporting requirements. 14 C.F.R. § 298 (1980).

¹⁶ 14 Fed. Reg. 1427 (1949).

¹⁷ 14 C.F.R. § 135.107 (1964).

1972, the CAB regulations were altered to allow commuter airlines to operate aircraft with up to 30 seats.¹⁸ The Deregulation Act raised the passenger limit of commuter aircraft to 55 seats.¹⁹ Furthermore, under deregulation the CAB has subsequently raised this limit to 60 seats.²⁰

By permitting larger commuter aircraft, the Deregulation Act has increased the range of markets in which these smaller airlines can compete. The use of larger aircraft has enabled commuters to serve higher density markets more effectively,²¹ especially those markets containing airports such as Washington National, LaGuardia and O'Hare, which are subject to capacity controls. These capacity controls have limited the number of flights by commuters to and from these airports. Larger aircraft enable commuter airlines to serve more passengers with the same limited number of flights.

The use of larger aircraft has probably increased passenger acceptance of commuter flights, because of the increased comfort and higher level of amenities made possible by greater size. Business travelers, a group that historically has constituted between 80 and 90 percent²² of commuter passengers in most markets, will likely find these larger aircraft more comfortable and therefore more acceptable. More importantly, the larger aircraft should also make commuter air travel more acceptable to nonbusiness travelers, a segment of the market which commuter airlines have previously had trouble attracting.²³

The impact of the change in commuter aircraft size limits has not yet been fully appreciated. The design and certifica-

¹⁸ 37 Fed. Reg. 19609 (1972).

¹⁹ Deregulation Act § 32 (codified at 49 U.S.C. § 416(b)(4) (Supp. IV 1980)).

²⁰ 14 C.F.R. § 298.2(i) (1983). The Deregulation Act also empowers the CAB to increase capacity limits when the public interest so requires. Deregulation Act § 22 (codified at 49 U.S.C. § 416(b)(4) (Supp. IV 1980)).

²¹ AIRLINE DEREGULATION: REBIRTH OF THE ENTREPRENEURS ch. 8 (J. Meyer & C. Oster eds. 1984).

²² This figure was cited in conversations the authors had with the management of more than ten commuter airlines.

²³ The management of Air Wisconsin indicated to the authors that nonbusiness travel increased markedly with the introduction of 50-seat aircraft into markets previously served with 19-seat aircraft.

tion process for new aircraft takes several years, and manufacturers are only now developing aircraft to take advantage of the revised regulations.²⁴ Commuter airlines are already using larger aircraft to serve dense markets more effectively, but these aircraft were developed prior to the rule change and do not incorporate the latest and most efficient flight technology.²⁵

One of the most important features of the Deregulation Act for commuter airlines is the easing of entry and exit restrictions for established jet carriers.²⁶ Jet aircraft have never been well suited for service in short haul, low density markets; the fuel price increases of 1973-74 and 1979 made them increasingly uneconomical.²⁷ With more flexibility to select their markets under deregulation, jet carriers began dropping these unprofitable routes.²⁸ Commuter airlines, with their smaller and more fuel efficient aircraft, have often found these markets profitable and have begun service as replacement carriers for the withdrawing jet airlines.²⁹ As much as 20 to 25 percent of the post deregulation commuter growth may be due to these replacement opportunities.³⁰

The revitalization and expansion of the FAA's Aircraft Loan Guarantee Program (Loan Program)³¹ under deregulation has benefited many commuter airlines. In an effort to quell fears that service to small communities would suffer as jet carriers terminated service under the eased exit requirements, the Loan Program was extended to include commuter carriers, whereas it had previously been limited to certificated carriers.³² The Loan Program insures loans on up to 90 percent of the principal and 100 percent of the interest incurred

²⁴ OFFICE OF TECHNOLOGY ASSESSMENT, *IMPACT OF ADVANCED AIR TRANSPORT TECHNOLOGY*, pt. 3, 38-41 (1982) (Congressional Board of the 97th Congress).

²⁵ *Id.*

²⁶ Deregulation Act § 3 (codified at 49 U.S.C. § 102(a)(4) (Supp. IV 1980)).

²⁷ *THE EARLY EXPERIENCE*, *supra* note 4, at 188-98.

²⁸ *Id.* at 128-38.

²⁹ *Id.* at 139-52.

³⁰ *AIRLINE DEREGULATION*, *supra* note 21, ch. 8.

³¹ Deregulation Act § 42 (codified at 49 U.S.C. § 1324 (Supp. IV 1980)).

³² For a description of the Aircraft Loan Guarantee Program see *AIRLINE DEREGULATION*, *supra* note 21, ch. 6.

by eligible commuters acquiring aircraft.³³ By insuring the lender against default, the Loan Program reduces the risk of loans to commuter airlines, thereby enabling carriers to finance aircraft acquisitions at lower rates and for longer terms than would have otherwise been possible. From 1978, when the Deregulation Act was passed, to January 15, 1982, over \$100 million in loans were guaranteed for commuters under the Loan Program for the purchase of 61 aircraft.³⁴ Of the commuter aircraft purchased under the Loan Program, slightly more than 21 percent were aircraft seating over 30 passengers.³⁵ Thus, the Loan Program has helped commuter airlines to expand and begin the transition to larger aircraft.

A provision guaranteeing "essential air transportation" for ten years to small communities was included in the Deregulation Act in response to concerns that small communities might lose air service under deregulation. To ensure continued service, an operating subsidy for commuter airlines was authorized under section 33 of the Deregulation Act with compensation based on community needs and the use of aircraft of appropriate size.³⁶

Subsidies for small community air service have a long history dating back to the Civil Aeronautics Act of 1938 (Aeronautics Act).³⁷ Section 406 of the Aeronautics Act authorized the CAB to subsidize the transportation of mail.³⁸ Compensation paid ostensibly for the support of mail carriage actually became a means of promoting and subsidizing passenger service to small communities.³⁹ While the payments initially went to the trunk airlines, by the early 1950's the local service airlines were receiving most of the payments.⁴⁰ By 1978, when the Deregulation Act was passed, annual payments to

³³ Deregulation Act § 42 (codified at 49 U.S.C. § 1324 (Supp. IV 1980)).

³⁴ AIRLINE DEREGULATION, *supra* note 21, at Tables 6-6 and 6-8.

³⁵ *Id.* at Table 6-7.

³⁶ Deregulation Act § 33 (codified at 49 U.S.C. § 419(d) (Supp. IV 1980)).

³⁷ Civil Aeronautics Act of 1938, Pub. L. No. 75-706, 52 Stat. 1705 (1938).

³⁸ *Id.* § 406.

³⁹ *See, e.g.*, West Coast Case, 6 C.A.B. 979-93 (1946).

⁴⁰ THE EARLY EXPERIENCE, *supra* note 4, at 27-31.

local service airlines were well in excess of \$75 million.⁴¹ Section 33 of the Deregulation Act was designed to replace the previous subsidy program and serve as the primary form of assistance to carriers operating in small communities.⁴²

Section 33 of the Deregulation Act guarantees that essential air transportation will be maintained for ten years to those communities listed on air carrier certificates as of October 24, 1978, the date the Act was passed.⁴³ The objective of the section 33 program is to ensure that small communities retain easy access to the nation's air transportation system via air service to one or more large airports, where opportunities to connect to other flights are available.⁴⁴ The CAB has been given the responsibility of determining what level of service is "essential" for each small community. Communities eligible for the section 33 program include both those that were receiving air service from certificated carriers when the Deregulation Act was passed, as well as others whose service had been suspended with the permission of the CAB, yet not formally terminated.⁴⁵ In addition, communities that had been deleted from carriers' certificates after July 1, 1968, were to be reviewed by the CAB for possible inclusion in the program.⁴⁶

The subsidy program authorized by section 33 of the Deregulation Act guarantees service to a greater number of communities than had been eligible for subsidy under the section 406 program of the Aeronautics Act. Critics of deregulation have charged that this broader coverage will cause the subsidy cost to the government to be much higher than under the old program.⁴⁷ On the other hand, supporters of the new program have argued that the total subsidy cost will

⁴¹ *Id.* at 139.

⁴² Deregulation Act § 33 (codified at 49 U.S.C. § 419 (Supp. IV 1980)).

⁴³ *Id.* § 33 (codified at 49 U.S.C. § 419(a), (b), (g) (Supp. IV 1980)).

⁴⁴ *Id.* § 33 (codified at 49 U.S.C. § 419(f) (Supp. IV 1980)).

⁴⁵ *Id.* § 33 (codified at 49 U.S.C. § 419(a) (Supp. IV 1980)).

⁴⁶ *Id.* § 33 (codified at 49 U.S.C. § 419(b) (Supp. IV 1980)).

⁴⁷ See U.S. Senate, Committee on Commerce, Subcommittee on Aviation, Science, and Transportation, *Hearings on Regulatory Reform in Air Transportation*, 95th Cong., 1st Sess., 21-24 (March, 1977).

be reduced. Section 33 of the Deregulation Act, unlike section 406 of the Aeronautics Act, has designated commuter carriers, with planes that are far more economical for low-density, short-haul service than the jet aircraft of the trunk airlines,⁴⁸ as eligible to provide essential air service.⁴⁹

Two factors support the argument that the new subsidy program actually results in lower subsidy costs. First, the typical commuter airline is able to provide frequent service in short-haul, low-density markets at a far lower cost than that of a carrier using jets.⁵⁰ With commuter airlines, fewer cities will require subsidy to ensure adequate air service, and those cities which require subsidy will need far less than under the old section 406 program.⁵¹ The second factor pointing to lower subsidy costs is that, unlike the old section 406 program, the Deregulation subsidy is tied to the needs of the community receiving the service rather than to the carrier providing the service.⁵² A competitive bidding process for the subsidy awards was intended to lead to the selection of the lowest-cost carrier.⁵³

The Deregulation Act includes other provisions to ensure that termination of service by large airlines has a minimal effect on small community air service. Certificated carriers and carriers receiving compensation are required under the Deregulation Act to give a 90-day notice to the CAB before being allowed to terminate service in any market.⁵⁴ Noncertificated carriers must give a 30-day notice.⁵⁵ The 30-day notice requirement represents an increase in regulation for many commuter carriers, which were able to withdraw from markets at will before deregulation. If terminations cause a community's air service to fall below the level of essential air transportation, the CAB will first attempt to arrange for a

⁴⁸ AIRLINE DEREGULATION, *supra* note 21, ch. 4.

⁴⁹ Deregulation Act § 33 (codified at 49 U.S.C. § 419(c) (Supp. IV 1980)).

⁵⁰ AIRLINE DEREGULATION, *supra* note 21, ch.4.

⁵¹ *Id.* at ch. 10.

⁵² Deregulation Act § 33 (codified at 49 U.S.C. § 419(d), (f) (Supp. IV 1980)).

⁵³ AIRLINE DEREGULATION, *supra* note 21, ch. 4.

⁵⁴ Deregulation Act § 33 (codified at 49 U.S.C. § 419(a) (Supp. IV 1980)).

⁵⁵ *Id.*

new carrier to enter the market to provide replacement service.⁵⁶ If, however, the CAB is unable to find a replacement carrier, it is empowered to hold the incumbent in the market until a replacement carrier is found.⁵⁷ If the incumbent subsequently suffers financial losses from being restrained, the CAB is required to compensate the carrier for those losses.⁵⁸ Thus, while the section 33 subsidy program of the Deregulation Act was designed for commuter carriers, local service carriers and trunk airlines have received payments for losses while being forced to provide air service until replacement carriers are found.

II. COMMUTER AIRLINE SAFETY

While economic regulation of commuter airlines has historically been minimal, safety regulation has been much more substantial. Commuter carriers are governed by FAA safety regulations,⁵⁹ which are generally referred to as "Part 135". Part 135 contains the requirements for commuter carriers' basic organizational structures, administrative procedures, crew qualifications, and aircraft and equipment standards.

Part 135 was adopted in 1964 in response to growth of the commuter industry.⁶⁰ The regulations were amended several times as the industry continued to grow, and most changes after 1964 pertain to aircraft and equipment operating procedures. For example, in 1967, an amendment was adopted prescribing requirements that would allow Instrument Landing Systems (ILS) procedures at certain airports.⁶¹ One of the most important changes during this period disallowed the use of single-engine aircraft in commuter operations after 1972.⁶² The amendments also introduced additional airworthiness standards and operating limitations for aircraft with

⁵⁶ *Id.*

⁵⁷ *Id.*

⁵⁸ *Id.*

⁵⁹ 14 C.F.R. § 135 (1964).

⁶⁰ Commuter Airline Safety 1970-1979, 4 (National Transportation Safety Board 1980).

⁶¹ 32 Fed. Reg. 6901, Amendment 135-5 (Effective May 5, 1967).

⁶² 14 C.F.R. § 135.18 (1978).

10 or more passenger seats.⁶³

The commuter industry grew and gained visibility through the 1960's and early 1970's, partly because commuters were moving into markets previously served by larger carriers.⁶⁴ During the late 1970's commuters began limited replacement service to communities terminated by local service and trunk airlines.⁶⁵ The first substitution occurred in 1967, when Apache Airlines replaced American Airlines at Douglas, Arizona.⁶⁶ American Airlines had originally used Douglas as a refueling stop for long flights.⁶⁷ As aircraft technology improved, such stops were no longer needed.

The evolution of the Allegheny Commuter System has further contributed to bringing commuter airlines to the attention of the public. The system was developed by Allegheny Airlines to provide commuter replacement service for communities Allegheny no longer wished to serve.⁶⁸ Beginning on November 15, 1967, Allegheny contracted with commuter operators to provide feeder service from small communities to larger cities served by Allegheny jets.⁶⁹ For commuter airlines that contracted with Allegheny Airlines, the arrangements were attractive because they provided opportunities for commuters to expand into new markets. In addition, the commuters gained some "legitimacy" from being identified with an established local service airline, and also gained substantial help from Allegheny in the form of assistance in marketing, ticketing, reservations, and other services. In return, Allegheny was able to terminate unprofitable service in low-density, short-haul markets while retaining the business of passengers wishing to connect to Allegheny's longer flights. Furthermore, as part of the contractual arrangement, Alle-

⁶³ 14 C.F.R. § 135.169 (1983).

⁶⁴ AIRLINE DEREGULATION, *supra* note 21, ch. 2.

⁶⁵ THE EARLY EXPERIENCE, *supra* note 4, at 148-52.

⁶⁶ Commuter Airlines and Federal Regulation: 1926-1979, 6 (Federal Aviation Administration 1980).

⁶⁷ *Id.*

⁶⁸ Following deregulation Allegheny Airlines changed its name to USAir.

⁶⁹ Commuter Airline Safety 126 and 211 (C. Oster and K. Zorn, Report to U.S. Department of Transportation, University Research Division, 1982).

gheny was able to impose strict operational and maintenance standards on the commuters in excess of those required by the CAB and FAA, thus retaining some control over the quality of service provided under the Allegheny Commuter logo.

As commuter airlines assumed a more important role in the nation's air transportation system, public attention began to focus on commuter safety relative to the jet carriers they were replacing. A common perception has been that commuter airlines, with their smaller aircraft, are not as safe as the trunk and local service airlines, and some travelers are therefore reluctant to fly the commuters.⁷⁰ As will be seen below, the perception is not fully justified.

A. *Measures of Safety*

The safety of airline travel is frequently assessed using statistics based on accidents or fatalities per passenger-mile or aircraft-mile. A widely cited statistic, passenger fatalities per 100 million passenger-miles, suggests that commuters are between 10 and 30 times less safe than established jet carriers.⁷¹ Even on this basis, however, commuters have a safety record which is no worse than that of the private automobile.⁷²

Upon reflection, it is not surprising that commuter airlines appear much less safe than jet carriers when a distance-based measure is used for comparison. Substantial differences between the average flight length of commuter carriers and jet carriers make such measures inherently biased against commuters. In airline travel the greatest risk of accident is during takeoff and landing. A typical jet, a B-727-200, for example, flying the average jet flight length of 730 miles with a full load of passengers will amass almost 106,000 passenger-miles but will takeoff and land only once. For a typical 19-passenger commuter aircraft to accumulate a similar number of passenger-miles, flying full on the average commuter flight of

⁷⁰ See Kaus, *supra* note 13, at 33-40.

⁷¹ Transportation Facts and Trends 17 (Transportation Association of America 1980).

⁷² *Id.*

120 miles, it would have to make over 46 flights, thus taking off and landing 46 times.

A statistical measure based on departures rather than distance more accurately reflects the risk facing a passenger on a commuter flight. While several departure-based measures can be constructed, passenger fatalities per million passenger-departures is a realistic measure to gauge the risk of taking a commuter flight. It is free from strong biases either for or against commuters, and without strong biases for or against different types of commuter operations. While data on passenger departures are not available, data on enplanements, a close substitute, are readily obtainable. A passenger is counted as an enplanement each time he or she boards a flight. On nonstop flights, passenger departures and enplanements are the same. On multistop flights, however, a passenger is counted as a single enplanement yet represents an additional passenger departure for every intermediate stop.⁷³

B. *Analysis of Commuter Safety*

A comparison of passenger fatalities per million enplanements for commuters and established jet carriers during the years 1970 through 1980 reveals that, in the aggregate, commuters are about three times less safe than jet carriers. During this period commuters had 3.26 passenger fatalities per million enplanements while certificated jet carriers had only 0.91.⁷⁴ The difference, while substantially less than that shown by distance-based measures, is still significant. Thus, while the concern with commuter safety has been overstated, it is legitimate to question whether deregulation's increased reliance on commuters may ultimately degrade the overall safety level of the nation's air transportation system.

Such a question, however, cannot be addressed solely with the use of aggregate, industry-wide safety figures. The com-

⁷³ Little information is available to assess the magnitude of the difference between passenger departures and enplanements in various segments of the air transportation industry, but there is no reason to believe that serious systematic biases are introduced by this measure in the analysis that follows.

⁷⁴ AIRLINE DEREGULATION, *supra* note 21, at table 5-3.

muter airline industry is in no sense homogeneous — operators vary in terms of size, experience, managerial expertise, route networks, aircraft fleets, and financial condition. Concluding that commuters are on the average somewhat less safe than jet carriers masks the divergence in safety performance within the commuter industry itself. To understand commuter safety and the implications of commuter growth on overall air transportation safety, it is necessary to examine the safety performance of different segments of the commuter industry. Data limitations, however, severely restrict the analyses to an examination of only a few of the factors most often thought to influence commuter safety.⁷⁵

The size of individual commuter operations varies widely within the industry. In 1980, the largest commuter carrier was well over 1,000 times larger than the smallest in terms of enplanements.⁷⁶ Segmenting the commuter industry based on airline size reveals that, from 1970 to 1980, the 20 largest commuters, who carried over half of all commuter passengers, were six times safer on the average than the rest of the industry.⁷⁷ Even more significant is the fact that the top 20 commuter airlines have a safety record virtually identical to the excellent safety record of the jet airlines.⁷⁸ Thus, increasing the role of commuters need not worsen the overall safety record of the airline industry if the growth occurs in segments of the commuter industry that operate with safety comparable to that of the jet airlines.

⁷⁵ For example, since most commuters are privately owned companies, the data necessary to assess the relationship between the financial health of commuter airlines and safety is unavailable. Similarly, data is not available to describe the training and experience of pilots at each commuter airline. Therefore, the role of these factors on safety will not be examined.

⁷⁶ Commuter Air Carrier Traffic Statistics (Civil Aeronautics Board 1980).

⁷⁷ The average rates for the 20 largest commuters and the rest of the industry are 1.15 and 6.97 passenger fatalities per million enplanements respectively. These rates and those that follow were calculated using operations data from the CAB Form 298 and accident data from the National Transportation Safety Board. More detail on methodology and results can be found in C. Oster and K. Zorn, *supra* note 69, at 209-17.

⁷⁸ The average rates for the 20 largest commuters and the jet airlines are 1.15 and 0.91 passenger fatalities per million enplanements respectively. Oster and Zorn, *supra* note 13, at 8.

One hypothesis about the impact of carrier size on commuter airline safety is that a larger airline can afford greater specialization in maintenance, training, and operations. By allowing each individual in the organization to concentrate on a narrower range of responsibilities, larger commuters may achieve more efficient performance. There may also be other areas where greater size makes some functions easier. For example, maintaining an aircraft requires access to a substantial inventory of spare parts. A large carrier with a sizeable fleet of aircraft may be better able to maintain such an inventory at its base of operations rather than contract out its maintenance to others.

A wide variety of aircraft are used by commuter airlines. The flight equipment ranges from six-seat, piston-engine craft, originally designed for corporate or general aviation use, to 60-seat turboprops designed as commercial transport aircraft. From 1974 to 1980, commuter operators using turbine-engine aircraft provided safer air service on the average than those commuters using only piston-engine aircraft or mixed fleets of both turbine and piston-engine aircraft.⁷⁹

Although the propeller engines on all commuter aircraft might appear much the same to a passenger's uncritical glance, a closer look would reveal important differences between the turbine engines usually found on aircraft seating 15 or more passengers, and the piston engines commonly found on smaller aircraft. Turbine engines operate using the same basic mechanism as modern fan-jet engines found on large jet aircraft. Turbine engines have far fewer moving parts than piston engines and have proven themselves to be more reliable and easier to maintain. Thus, it is not surprising that commuter airlines which operate only turbine-engine aircraft have amassed a better safety record than those carriers operating other types of fleets.

⁷⁹ Carriers using only turbine engine aircraft had an average rate of 1.06 passenger fatalities per million enplanements; carriers using only piston engine aircraft had an average rate of 2.23 passenger fatalities per million enplanements; and carriers operating mixed fleets of both piston and turbine-engine aircraft had an average rate of 2.21 passenger fatalities per million enplanements. C. Oster and K. Zorn, *supra* note 69, at 134.

There is reason to believe that the effects of carrier size and aircraft type do not operate independently of one another. Table 1⁸⁰ presents results from an analysis of the interaction of carrier size and aircraft (engine) type. Among carriers using piston engines exclusively, the twenty largest had a better safety record than the remaining carriers.⁸¹ In addition, the twenty largest piston carriers had about the same safety record as the ten biggest turbine carriers, which suggests that among the larger carriers both piston and turbine aircraft can be operated with the same degree of safety.⁸² The results in Table 1 also reveal that among the smaller carriers, those operating turbine fleets have a much better safety record than those operating either piston or mixed fleets.⁸³

Commuter airlines fly into the largest and best-equipped airports in the country, and also into smaller airports which are equipped with less sophisticated landing and navigational aids. In fact, it is often said that much of the difference in safety performance between commuter airlines and larger jet carriers stems not from the commuters themselves, but rather from the nature of the airports they serve.⁸⁴ An analysis of commuter aircraft accidents that occurred during the landing phase reveals that passenger fatality rates are higher for flights into airports not equipped with glide slopes⁸⁵ than for

⁸⁰ Table 1

INTERACTION OF CARRIER SIZE AND FLEET TYPE

Passenger Fatalities per Million Enplanements

Fleet Type	Carrier Size	
	Largest 10 or 20	Remainder
Piston Only (Largest 20)	1.66	3.73
Turbine Only (Largest 10)	1.60	0.11
Mixed Piston and Turbine (Largest 10)	0.59	6.34

Source: Civil Aeronautics Board, Form 298, Schedule T-1 and National Transportation Safety Board, Accident Briefs

⁸¹ *Id.*

⁸² *Id.*

⁸³ *Id.*

⁸⁴ U.S. Congress, House Senate Committee on Aviation, *Reauthorization of the Airport and Airway Development Program*, 96th Cong., 1st Sess., 1979, p. 595.

⁸⁵ The glide slope is a navigational aid that assists a pilot in maintaining the correct path of descent during landings. Such a guidance system is particularly useful during landings made in bad weather or conditions of poor visibility.

flights into airports with such equipment. Before concluding that glide slopes are crucial to safe operations, however, the complicating factor that airports without glide slopes are more frequently served by smaller commuter carriers must be recognized.

The significance of size as a determinant of commuter safety is further strengthened when the interaction of carrier size and landing aids is analyzed. Table 2⁸⁶ indicates that the presence of glide slopes at airports does not affect the safety records of commuters landing at these airports. Instead, the table demonstrates that large commuters operate with equal safety into both types of airports.⁸⁷ Likewise, small commuters have similar safety records whether or not they are operating into airports equipped with glide slopes.⁸⁸ Therefore, the contention that the lack of sophisticated landing aids in smaller airports leads to poorer safety records for the carriers serving those airports is not supported. The important implication of this finding is that service to small community airports is not inherently less safe than service to larger, better equipped airports. Instead, the characteristics of the commuter airline serving the community is a far more important determinant of the level of safety.

III. FUTURE TRENDS

Commuter safety regulations underwent a major revision by the FAA in 1978. The revisions evolved from a review of

⁸⁶ Table 2

INTERACTION OF CARRIER SIZE AND NAVIGATIONAL AIDS

	Passenger Fatalities Per Million Enplanements	
	Top 20	Remainder
<i>Airports With Glide Slopes</i>		
Overall Rate	.89	3.72
Average Rate	.98	5.50
<i>Airports Without Glide Slopes</i>		
Overall Rate	.66	4.24
Average Rate	.66	5.38

Source: Civil Aeronautics Board, Form 298, Schedule T-1 and National Transportation Safety Board, Accident Briefs

⁸⁷ *Id.*

⁸⁸ *Id.*

safety regulations that was prompted in part by a 1972 National Transportation Safety Board (NTSB) report.⁸⁹ The report pointed out several inadequacies in FAA regulation of commuter airlines, including: 1) inadequate pilot qualification requirements, 2) marginal requirements for maintenance training programs for crew members, and 3) lack of minimum equipment lists and flight continuation rules.⁹⁰

The FAA's 1978 revisions of Part 135 of its safety regulations addressed these three inadequacies.⁹¹ Part 135 now includes a provision requiring the pilot in command of a commuter aircraft seating 10 or more passengers to hold an airline transport pilot (ATP) certificate rather than simply a commercial pilot certificate.⁹² This pilot qualification provision for commuter airlines parallels pilot qualifications for established jet carriers under Part 121 that require an ATP for all operations.⁹³

The revised rules have also increased the minimum amount of pilot experience required for the particular type of aircraft being used. Specifically, the regulations require a commuter pilot in command to have made three takeoffs and three landings in the same type of aircraft within 90 days preceding a scheduled flight.⁹⁴ The qualifications for the second-in-command remain unchanged because they already parallel the requirements for jet carriers operating under Part 121.⁹⁵ The co-pilot is required to have at least a commercial pilot certificate with appropriate category and class ratings.⁹⁶

Revised maintenance requirements for commuter airlines include more detailed and extensive procedures for all types and classes of aircraft used by Part 135 operators. The revisions of Part 135 also require additional maintenance record

⁸⁹ Air Taxi Safety Study (National Transportation Safety Board 1972).

⁹⁰ *Id.* at 2.

⁹¹ 14 C.F.R. § 135 (1978).

⁹² 14 C.F.R. § 135.243 (1983).

⁹³ 14 C.F.R. § 121.437 (1983).

⁹⁴ 14 C.F.R. § 135.243 (1983).

⁹⁵ 14 C.F.R. §§ 121.437, 135.245 (1983).

⁹⁶ *Id.*

keeping.⁹⁷ For example, mechanical reliability reports and mechanical interruption reports were added to the list of required records.⁹⁸ In addition, a requirement that all manuals list information about "persons with whom a carrier has arranged to perform its required inspections" was added.⁹⁹

Initial and recurrent training programs became a basic requirement for all Part 135 operators in 1978. The new rule requires that the program be approved by the FAA¹⁰⁰ and that a written curriculum be developed for each type of aircraft used by a commuter.¹⁰¹ The training programs were extended to cover pilots, flight attendants, and flight instructors.¹⁰² Crew training is also required in the carriage of hazardous materials.¹⁰³ The previous rule merely required a pilot training program appropriate to the type of aircraft used by the carrier.¹⁰⁴

Minimum equipment lists for commuters were also established for the first time in the 1978 FAA revisions.¹⁰⁵ Cockpit voice recorders,¹⁰⁶ ground proximity warning systems,¹⁰⁷ fire extinguishers,¹⁰⁸ and oxygen equipment¹⁰⁹ are some of the items addressed in the new rule. The FAA has also mandated radio and navigation equipment for extended over-water flights and instrument flight rule (IFR) operations.¹¹⁰ For example, whereas before revision commuter air carriers were required to carry only one transmitter with the ability to transmit and receive from at least one ground facility at all times,¹¹¹ the revised rule requires two such transmitters.¹¹²

⁹⁷ 14 C.F.R. §§ 135.415, 135.417, 135.419, 135.421 (1983).

⁹⁸ 14 C.F.R. §§ 135.415, 135.417 (1983).

⁹⁹ 14 C.F.R. § 135.419 (1983).

¹⁰⁰ 14 C.F.R. § 135.323(a)(1) (1983).

¹⁰¹ 14 C.F.R. § 135.327 (1983).

¹⁰² 14 C.F.R. § 135.323 (1983).

¹⁰³ 14 C.F.R. § 135.333 (1983).

¹⁰⁴ 14 C.F.R. § 135.138 (1977).

¹⁰⁵ 14 C.F.R. § 135.149 (1983).

¹⁰⁶ 14 C.F.R. §§ 135.151, 135.153, 135.155, 135.157 (1983).

¹⁰⁷ *Id.* § 135.153.

¹⁰⁸ *Id.* § 135.155.

¹⁰⁹ *Id.* § 135.157.

¹¹⁰ 14 C.F.R. § 135.165 (1983).

¹¹¹ *Id.* § 135.159 (1977).

The FAA has not applied the upgraded standards of the 1978 revisions equally to all types of operations. Instead, the new standards take into account the varied nature of commuter airlines. Operators flying aircraft with nine or fewer passenger seats have been placed under an upgraded safety program that is more stringent than the prior rule but still very similar to the original Part 135.¹¹² Those commuters flying aircraft carrying 10 to 30 passengers have been placed under new Part 135 requirements that approximate the jet carriers' Part 121,¹¹⁴ and aircraft carrying more than 30 passengers have been placed under Part 121.¹¹⁵

These distinctions place the majority of commuter airline operators under the new Part 135 since only a relatively small portion of the commuter industry flies aircraft seating more than 30 passengers.¹¹⁶ While most operators are governed by the least stringent portions of Part 135,¹¹⁷ most commuter revenue passenger-miles (RPM), 67 percent, are flown by commuter airlines operating either under Part 121 or under the portions of Part 135 designed to be comparable to Part 121.¹¹⁸ Only the remaining one third of RPM's flown by commuters remain under rules similar to the original Part 135.

Thus, the 1978 rule change did not uniformly tighten the safety regulations under which commuter airlines operate. This variation is unfortunate in light of the differences in safety performance reported above. The new rules are most stringent for those segments of the industry that operated most safely prior to 1978, the larger carriers, yet were tightened least for those segments that amassed the worst safety record prior to 1978, the smaller carriers.

It is too soon to attempt an assessment of the long-run im-

¹¹² *Id.* § 135.165 (1093).

¹¹³ 43 Fed. Reg. 46742, 46743, and *see, e.g.*, 14 C.F.R. §§ 135.169, 135.171, 135.173 (1983).

¹¹⁴ 14 C.F.R. § § 121, 135 (1983).

¹¹⁵ 14 C.F.R. § 121 (1983).

¹¹⁶ AIRLINE DEREGULATION, *supra* note 21, ch. 8.

¹¹⁷ *Id.*

¹¹⁸ *Id.*

pact of the 1978 revisions on commuter safety. Some insight into the likely effect can be gained, however, by examining the experience of the Allegheny Commuter System. The Allegheny Commuter System has been a special subset of the commuter industry since its beginning in 1967. Allegheny Commuters must meet operation and maintenance standards set by Allegheny Airlines. These standards historically have been more stringent than those required by the FAA for other commuters. Allegheny Commuters has amassed a much safer record than the rest of the commuter industry with a rate of 0.14 passenger fatalities per million enplanements for Allegheny Commuters versus 3.86 for other commuters.¹¹⁹ Allegheny Commuters has a better safety record than either the twenty largest non-Allegheny commuters or the established jet carriers.¹²⁰

It would seem that the more stringent standards imposed by Allegheny Airlines, coupled with the generally high quality of management in commuters selected by Allegheny Airlines, have had a major impact on safety. The excellent safety record of these carriers provides support for the argument that revisions in commuter safety regulations which bring maintenance and operational requirements more in line with those for certificated carriers would improve safety in the commuter industry. The comparison further suggests that the 1978 revisions to Part 135 will further improve commuter safety.

IV. CONCLUSION

Under deregulation, the increased reliance on commuter airlines as replacement carriers for service to small communities is not inconsistent with the governmental goal of preventing deterioration in air safety. As the safety record of the twenty largest commuter airlines indicates, most commuter airline passengers travel with a level of safety virtually identical to that which they would experience on established jet

¹¹⁹ *Id.*, ch. 5.

¹²⁰ *Id.*

carriers. Moreover, a major segment of the commuter airline industry, the Allegheny Commuters, has operated with a safety record that is superior to that of the jet carriers.

The record of Allegheny Commuters bodes well for commuter safety in the future. Its experience while operating under the tighter standards imposed by Allegheny Airlines suggests that the tightening of the safety regulations in 1978 might eventually lead to an improvement in commuter airline safety. Introduction of the next generation of commuter aircraft, most of which are anticipated to be turbine-powered, should also contribute to improved commuter safety because, as discussed above, small carriers have been able to operate turbine aircraft much more safely than piston aircraft. In addition, the recent trends in commuter growth suggest that future growth will likely be concentrated among the larger and safer carriers.¹²¹

¹²¹ C. Oster and K. Zorn, *supra* note 69, ch. 4, 9.

