

Toronto Island Airport Access

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The Toronto Island Airport is a small downtown airport serving metropolitan Toronto. It is used for general aviation and limited commercial aviation activity. The airport can be accessed only by a ferry, the operational costs of which have become increasing prohibitive. Issues and concerns surrounding the airport itself and its means of access are addressed, as are recommended alternatives.

The Toronto Island Airport (TIA) is one of three principal airports serving the Toronto area. It is about 1½ mi, or 10 min, from the central business district of Toronto (Figure 1). Established in 1937, it was the major airport for Toronto until the development of Pearson International Airport (PIA) in suburban Malton. During World War II, it served as a training base for the Royal Norwegian Air Force and the Royal Canadian Air Force. It has been operated by the Toronto Harbor Commissioners (THC) since 1962, although its airport operations have been subsidized by Transport Canada, a federal agency, since 1974.

TIA is one of Canada's busiest airports in terms of aircraft movements (124,500 in 1990), consistently ranking in the top 10 (1). Indeed, in 1961, TIA had the highest number of aircraft movements of all Canadian airports. Since the advent of commercial aviation to TIA in 1983, the number of commercial air travelers using the airport each year has increased from about 20,000 to approximately 275,000 currently.

The operation of the airport is governed by a tripartite agreement signed between Transport Canada, the city of Toronto, and THC. This agreement limits airport expansion, prohibits jet aircraft, and forbids the construction of a vehicular tunnel or a bridge to the island. A ferry alone provides access to the facility.

The intent of the paper is to identify the unique circumstances surrounding the existence of this downtown airport, focusing on the costs associated with providing access (i.e., ferry service) to it, the alternatives to ferry service, and the acceptability of such alternatives.

TORONTO ISLANDS

The Toronto Islands were created by major storms more than 100 years ago from what was then a peninsula. They are separated from the mainland by a western gap that is used principally by recreational boaters and by an eastern gap that commercial ships use to access the Port of Toronto.

The Toronto Islands have largely functioned as a local resort. Summer cottages and, later, year-round residences were subsequently established on the islands. Their numbers peaked in the 1950s. A program of park development by the municipality resulted in the removal of many of those homes over the next 20 years. Intense lobbying by island residents was necessary for the preservation of the homes that remain. The only means of access to the island is by boat. The parks department operates several large ferries to carry summer passengers to the island parks and provide year-round service to the 450 or so permanent island residents. Each year the ferries carry some 1.2 million passengers at a cost of \$6.5 million and a deficit of \$3.4 million (Metropolitan Toronto Parks and Recreation Department and Ontario Ministry of Transport, unpublished data).

TIA sits on 820 acres at the northwestern part of the island, approximately 3 km from island residences; it is separated from the mainland by the western gap. It has three runways: one east-west runway that is 4,000 ft long and can be lit (this one is most often used), and two unlit runways that are 3,000 ft long—one east-west and one north-south. TIA's hours of operations are from 6:30 a.m. to 11:30 p.m. with customs facilities available from 8:00 a.m. to midnight.

Airside facilities have been considerably enhanced in the past few years: a microwave landing system was installed and a new air traffic control tower and maintenance building were built. The value of recent capital expenditures at the airport by the federal government exceeds \$20 million.

ISLAND AIRPORT ACCESS

The distance between TIA and the mainland is about 394 ft (120 m). Access was by means of a cable ferry until 1963, when this service was abandoned and replaced by a temporary tugboat service. From 1965 to the present, a used ferry—the Maple City, which could accommodate four vehicles and 40 passengers—was deployed to meet the demand (Figure 2). The actual capacity of the ferry is determined by crew size; the ferry is now licensed by the Coast Guard to carry up to six vehicles and 100 passengers. In 1985 a second ferry (and the sister ship to the Maple City—the Windmill Point) with similar capacity was purchased as a backup vessel to ensure that service levels would not be disrupted in the event of a mechanical breakdown.

Ferry operations are done 18 hr/day (6:00 a.m. to 11:30 p.m.), 7 days a week; the ferry undertakes some 53,870 trips each year. The actual ferry trip takes less than a minute, and service is provided every 15 min. It is reportedly the shortest ferry ride in the world.

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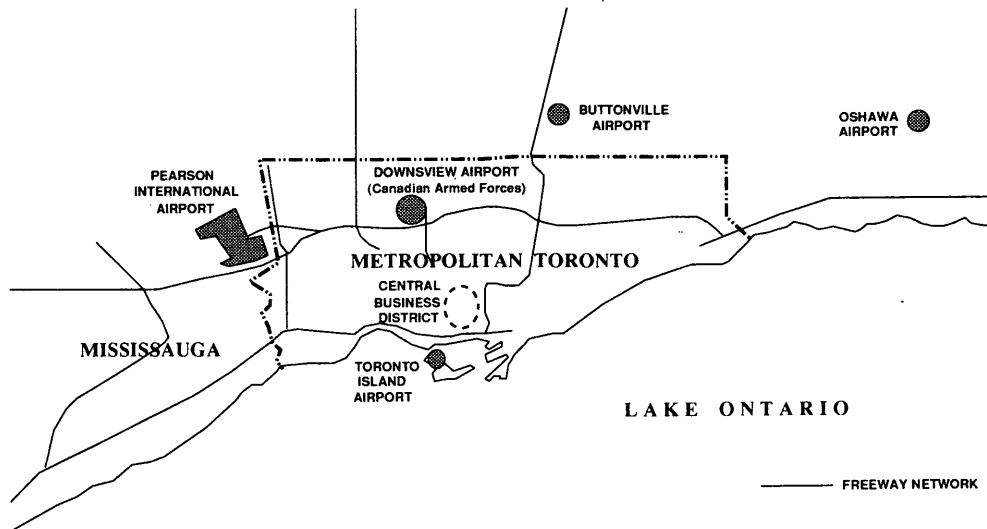


FIGURE 1 Regional airports in Toronto.

The Ontario Ministry of Transport has been responsible for the annual deficit for ferry operations since 1974. The rationale for its original involvement was based on

- Its support for multimodal systems such as short take-off and landing service, to be based on the island, and through job creation for associated aircraft production at a local manufacturing plant;
- Support for air ambulance service operated by the provincial Ministry of Health at TIA; and

- The necessity of providing a place for the off-loading of short-distance air traffic from PIA.

Use of TIA for air ambulance service has since increased because of the proximity of the airport to downtown Toronto hospitals, congestion at PIA, and congestion levels on Toronto streets and highways between suburban airports and downtown hospitals.

The Ministry of Transport contributes to the operation of 11 other ferry services in the province of Ontario to varying

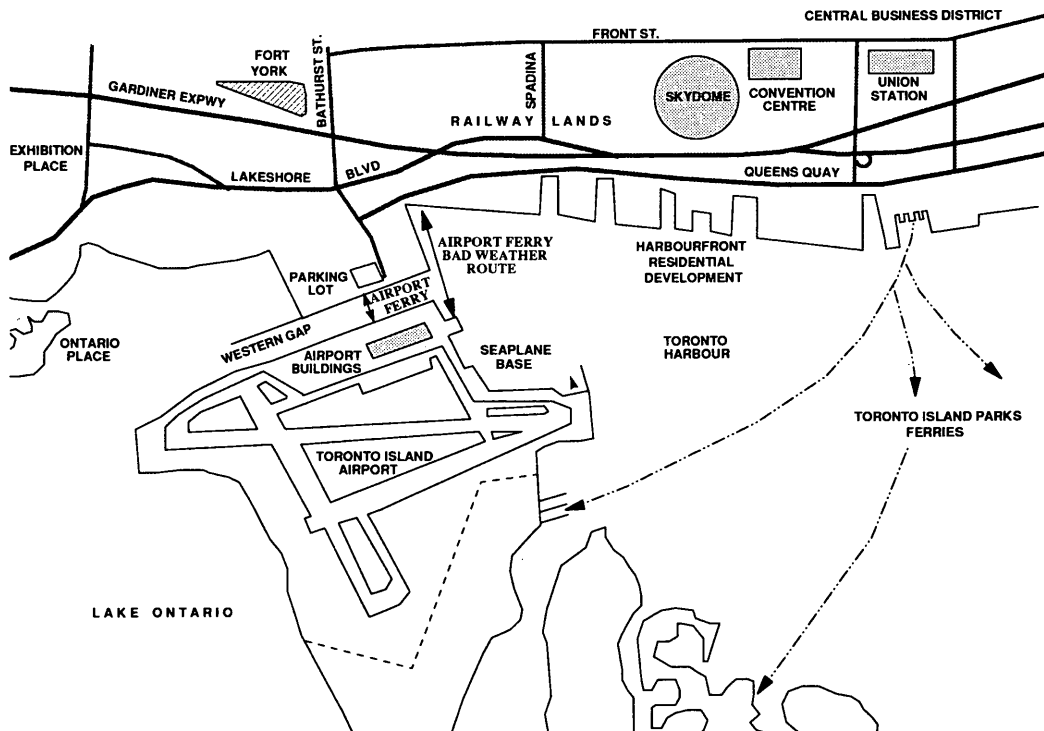


FIGURE 2 Toronto Island Airport.

degrees. Total expenditures for 1989 were on the order of \$9 million.

DEMAND FOR FERRY SERVICES

An economic impact study commissioned by THC established that TIA performed a valuable role in the regional aviation system (2). The following direct, indirect, and induced impacts were generated by the airport in 1987:

- \$183 million in business sales revenue,
- \$141 million to the gross provincial product,
- More than \$32 million in tax earnings, and
- More than \$74 million in wages and salaries.

In terms of aircraft movements, TIA has ranked among Canada's top 10 airports for 9 of the past 10 years, rating as high as third. Aircraft movements during the past decade have ranged from a low of 99,300 in 1989 to a high of 214,600 in 1981 (Figure 3). In addition, between 600 and 1,000 seaplanes use TIA airspace and land in Toronto harbor each year (TIA, unpublished data). The number of passengers carried by the ferry increased steadily from 210,000 in 1981 to 819,000 in 1987, commensurate with the increase in commercial aviation activity. However, the ferry passenger total has since fallen to 592,000 in 1990 (Figure 4).

There are many patrons of the ferry service. Federal government employees working at the airport (e.g., customs personnel and air traffic controllers) and THC staff are excluded from paying fares. Recent information suggests that 60 percent of ferry patrons do not pay for passage. Commercial passengers using the airport are charged for passage. Those that arrive or depart by dedicated bus service are not individually required to pay for ferry service; that charge is included in the airline ticket price, and the commercial airline is invoiced for their passage. Those that choose to park in one of the 124 spaces on the mainland parking lot and cross over to the airport can use their tickets as free ferry passes.

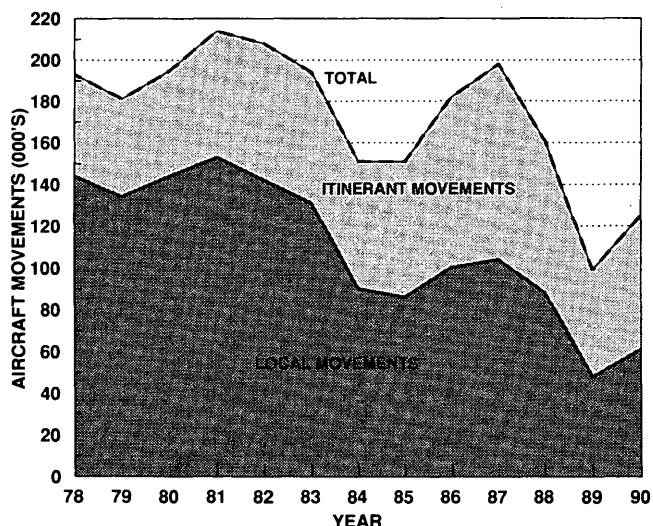


FIGURE 3 Annual aircraft movements, TIA (I).

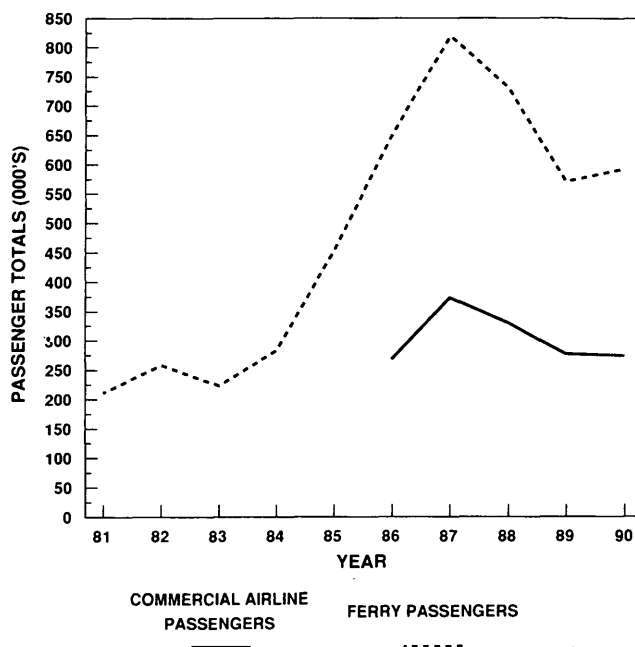


FIGURE 4 TIA ferry passengers (Source: THC).

Commercial passengers provide the bulk (typically 70 percent) of ferry passenger revenues. Their totals rose from 20,000 in 1983 to almost 373,000 in 1987, but they have since fallen to about 274,000 in 1990. Noncommercial or walk-on adult passengers pay a cash fare of \$2.50 (return) on the ferry; children between the ages of 5 and 13 and seniors are charged \$1.00 (return). These passengers tend to be visitors to the airport, passenger associates, or general aviation aviators and related personnel.

Well over 1,500 hospital patients are served annually by way of TIA. Indeed, considerably more Medivac patients access Toronto hospitals via TIA than via PIA or the other suburban airports—TIA has assumed the hub role for provincial Medivac operations for both inbound and outbound flights (i.e., doctors transported to remote areas for medical emergencies). On the order of six ambulances are transported on the ferries each weekday, up from four ambulances a day in 1988. On one day in February 1991, 16 ambulances were transported on the ferry.

In addition, revenue is received for transporting vehicles to the island; about 40,000 vehicles are transported each year. There is some discretion exercised with respect to passage payment. Some vehicles are charged for passage (some personal vehicles)—the fee per vehicle ranging between \$7.00 and \$45.00—but other vehicles are not charged (e.g., construction vehicles, ambulances, petroleum tankers).

REASONS FOR INFERIOR PERFORMANCE

TIA has not attained its maximum commercial potential for several reasons. First, the decline in the economy has affected the operations of both commercial and general aviation operators. Aircraft movements at the airport were more than

halved between 1987 and 1989, with considerable declines in both local and itinerant movements.

Second, the general aviation component of the facility is reputedly not priced competitively to attract other general aviation movements. Subsequently, when capacity constraints on general aviation traffic at PIA were introduced in the 1980s, displaced general aviation traffic went to suburban airports rather than to the island, and considerable traffic at TIA itself was diverted.

Third, certain politicians in the city of Toronto and adjacent residential neighborhoods—particularly the island residents—are largely and very vocally opposed to its enhancement. For several years they have lobbied and litigated to prevent the granting of permission for additional carriers to use TIA, and they have tried to halt construction of a temporary terminal to house those additional carriers. Such efforts have been unsuccessful in preventing new carriers or the construction of a temporary terminal, but they have succeeded in delaying the upgrading of airport facilities and the introduction of additional operators.

Restrictions on the size or noise of aircraft and the time or type of operation (i.e., some of the terms of the tripartite agreement) have, to a certain extent, placed the airport at a competitive disadvantage as well. The largest aircraft that land at TIA are Dash 7 and Dash 8 varieties that compete with jets over distances of 300 to 400 mi and can carry between 35 and 50 passengers. The only jets that can access the facility are Medivac-related.

In the 1980s, when there was a single commercial carrier at TIA, it served eight destinations and generated 40 movements a day. (This particular carrier curtailed operations in 1990 and suspended operations in 1991.) In 1990 a commuter movement cap of 112 per day was introduced by THC with the granting of additional landing rights to four carriers. A second commercial carrier was added that year that served three destinations and generated 21 movements per day. However, two other principal carriers did not exercise their rights, mainly because of market conditions.

Fourth, there are perceived and real difficulties of using air services at TIA for both commercial and general aviation purposes because it is an island. There are concerns about being stranded on the island either during inclement weather or after the last ferry has departed for the mainland (although a more costly water taxi service is available). There is also a reluctance to pay a one-way fare of \$2.00 to cross to a destination that is only a stone's throw away.

Fifth, for 10 to 15 days a year, wind and ice conditions require the ferry to use a more protected bad weather berth. Access to the ferries is more awkward during this time—vehicles cannot be accommodated, and boarding and exiting the ferry is more difficult and airside ground access is made more uncomfortable because of the absence of sufficient shelter and wind breaks for pedestrians.

Sixth, the ferries and docks themselves require considerable amounts of money to maintain their safety and adherence to Canadian Coast Guard standards. Both ferries are more than 40 years old. Maintenance has been sometimes deferred in order to maintain fiscal prudence, with the result that both the ferries and the dock facilities now require extensive rehabilitation to extend their useful lives.

PRESENT COST OF ACCESS

The cost of operating the ferry climbed from \$426,000 in 1981 to \$1.2 million by 1990 (THC, unpublished data). The increase in cost can be attributed to several factors, among them the following:

- The costs of maintaining two ferries instead of just one,
- The age of the ferries and the difficulties associated with obtaining specially commissioned parts in the advent of a mechanical breakdown,
- The advanced age and disrepair of the docks caused in part by increased vehicular crossings, and
- The need to expand the operating hours of the airport to attract potential revenue from commercial and general aviation.

Revenues have increased more slowly, from \$95,000 in 1981 to \$450,000 in 1990, as the airport has failed to meet potential commercial and general aviation expectations (Figures 5 and 6).

The deficit for operating the ferry rose from \$330,000 in 1981 to \$823,000 in 1990. The total amount of deficit paid by the province between 1981 and 1990 was about \$4.9 million. The deficit as a percentage of cost was as high as 80 percent in 1983, falling to as low as 47 percent in 1987, but it increased steadily to 64 percent in 1990 (Table 1).

The single largest expense is operating labor, at between 57 and 59 percent of the total cost. The average wage for ferry staff is on the order of \$49,000/year, due to the need to work between 8¼ and 9¼ hr/shift and the opportunity to accrue considerable overtime credits. Coast Guard staffing requirements afford little flexibility in reducing this expense.

The works department's overhead charge to the province has been consistently applied through this period; it remains at 17 percent of the total. Special items, a catch-all category that includes most emergency repair work, has climbed from 3 percent in 1984 to about 12 to 13 percent currently (Table 2). This is largely a function of the advanced age of the ferries and the frequent need to overhaul engines or commission specially designed components, such as new clutches, since parts manufacturers have stopped making them.

The operational and maintenance costs of the docks themselves have fluctuated considerably, ranging from 2 to 12 per-

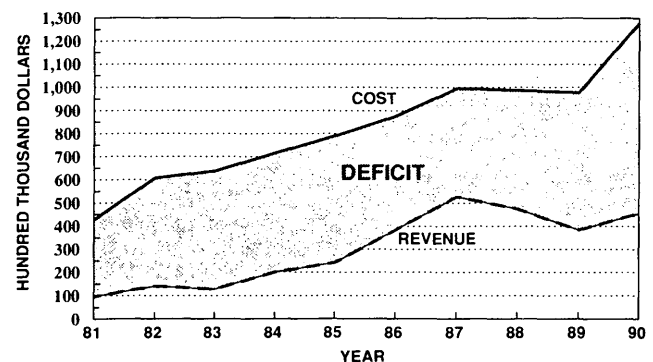


FIGURE 5 TIA ferry access: cost and revenues, 1981-1990.

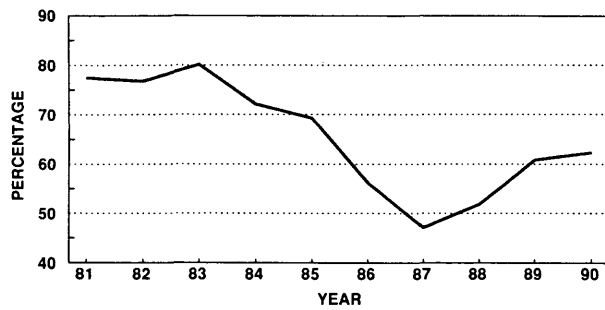


FIGURE 6 TIA ferry access: deficit as percentage of cost.

cent of the yearly cost of operation. The bad debt category results from the cessation of operations of one of the two commercial carriers at TIA. That carrier was invoiced for ferry passenger passage charges, but those costs could not be recovered. Similarly, airside landing charges were not recovered. All other expenses themselves constituted a very small proportion of the costs of ferry operations in any given year.

PROSPECTS FOR GROWTH

A study commissioned by the city of Toronto investigated the possible roles for TIA under a number of scenarios (3; Table 3). It concluded that the airport could not fulfill a role as a reliever airport for PIA, given the nature of hub and spoke traffic at PIA and the amount of commuter traffic at the island. However, it acknowledged that it did perform a valuable function with respect to handling general aviation traffic that might otherwise go to PIA. The study also concluded that TIA could not function as an exclusive general aviation facility. It determined that the airport could not be financially viable as such, even with a doubling of itinerant general aviation traffic.

Other scenarios examined a continuation of the same mix of activity at forecast annual rates (4 percent for commuter traffic and 1.4 percent for general aviation) and increased commuter movements with and without jet aircraft.

Under these scenarios, ferry capacity would be compromised soon after the turn of the next century but could be upgraded with the introduction of a larger ferry or the construction of a pedestrian tunnel to provide adequate capacity. The study did not address, however, the utility of a tunnel option or the continued willingness of higher levels of government to subsidize ferry operations.

TABLE 1 TIA Ferry Access Financial Situation (\$ thousands)

YEAR	COST	REVENUE	DEFICIT
1981	426.4	95.5	330.9
1982	606.3	140.1	466.2
1983	637.4	127.1	510.3
1984	714.9	199.5	515.5
1985	790.3	242.5	547.8
1986	876.4	383.6	492.8
1987	995.6	526.6	469.0
1988	987.4	475.8	511.6
1989	977.6	383.5	594.1
1990	1,277.8	455.0	822.8

TABLE 2 Detailed Ferry Results (\$)

PARTICULARS	1984	1987	1990
Maint. Labour	18117	33997	28029
Material	9177	11724	16277
Plant & Sundry	4781	13807	10531
Insurance	3000	8990	8129
Operating Material	36488	36066	40908
Special Items	21603	129338	143219
Operating Labour	407785	569741	710230
Alternate Service	4083		900
Metro Ferry	886	1069	
Dock Op'g & Maint	79942	19821	48720
N.E.S.	9900	5092	3978
Sub-Total	595762	829645	1010921
Works Overhead	119152	165929	202184
Total	714914	995574	1213106
Ferry Revenue	199468	526588	433333
Bad Debt			65776
Deficit	515446	468986	823854

ALTERNATIVE ACCESS OPTIONS

A number of studies commissioned by various agencies identified that use of the present ferry system represented a weakness in achieving the maximum commercial potential of the airport and proposed alternatives means (4-6). Preferred alternatives to deal with the question of access varied by study. However, limited action had never been taken to improve access to the airport for a number of reasons, among them cost and jurisdictional complexities.

In 1935 a contract to construct a tunnel for \$1 million was actually let by the federal government, but it was cancelled before any work had progressed to any meaningful extent, after a change in government. As stated earlier, a second ferry was purchased in 1985 for \$120,000 to ensure a consistent level of service.

In 1988 the Ministry of Transport commissioned a study to evaluate access alternatives (7). It investigated five options: expanded ferry service, a pedestrian tunnel and vehicular ferry, a low-level bridge, a high-level bridge, and a vehicular tunnel.

The 1987 capital costs associated with those alternatives have been updated and are as follows:

- Two new ferries and new docks—\$12 million,
- A pedestrian tunnel and overhaul of one ferry—\$23 million,
- A vehicular tunnel—\$39 million, and
- Low-level bridge and shipping channel relocation—\$35 million.

The conclusion of that report was that a restricted-access vehicular tunnel would provide the highest level of service

TABLE 3 TIA Annual Enplaned/Deplaned Passengers (thousands)

SCENARIO	PROJECTED LEVELS		
	1992	2000	2008
Current Trends	510	704	964
Commuter, No Jets	607	940	1,273
Commuter, with Jets	752	1,102	1,400

and, unlike the ferry, would have adequate capacity to meet access requirements for the foreseeable future. Of prime importance were the concerns of disaster response agencies about an aircraft accident involving large numbers of people who needed assistance and the suitability of the access alternatives.

The total annual cost of the tunnel option, including amortization, operation, and maintenance, was comparable to the pedestrian tunnel option. However, acceptance of this option would require altering the terms of the tripartite agreement.

The other options were rejected because they would only marginally improve access; insufficiently address emergency access concerns; or result in less capacity and less revenue potential, higher operating costs, or less flexibility with respect to land use impacts and effects on recreational boating activity in the harbor.

COMMENTS

To some politicians and residents of Toronto, the value of a downtown airport is questionable. Those individuals or groups would prefer that the site be used for park land or affordable housing. Others are willing to tolerate it as currently envisioned: a general aviation airport with limited commercial operations.

General aviation airports perform a valuable role. Studies in the United States point to their increased use for business as opposed to recreational activity because of travel time and operational cost savings.

It has been estimated that at least a quarter of the general aviation aircraft fleet is operated exclusively for business and more than half are used partly for business purposes. In addition, almost three-quarters of the largest publicly held corporations in the United States operate their own business aircraft, and more than two-thirds of all business aircraft trips use general aviation airports rather than commercial air terminals (8).

Residential developments have recently been built near the airport: residents in those complexes do not wish to see an expansion of its commercial operations; they wish to have general aviation activities curtailed as well. Some see the limited capacity of the ferry to handle vehicles and passengers as a way to control airport operations just as they see the jet prohibition (9).

Prior studies have determined that an increase in commercial and general aviation activity is required if the airport is to become financially viable. An examination of the regional airport situation would suggest that this is a possible scenario, most certainly if an open-skies policy is adopted, offering alternative American venues.

It reportedly is not necessary for the jet restriction to be lifted to attain such growth. Indeed, there is muted recognition that the lower noise levels created by the new generations of jet aircraft can make it possible to negotiate successfully for the relaxation of that restriction.

As well, regional airlines in Canada now largely feed the larger parent airlines through the application of hub and spoke connecting service. This has concentrated airport activity to the larger international airports such as PIA. If those regional airlines are afforded some flexibility, with the addition of

alternate Canadian and American destinations, then TIA itself becomes more attractive.

This would suggest that it would be prudent to improve access to TIA to meet the needs of present and future users (implicitly reducing or eliminating the current level of operating subsidies) and to make more safe, and convenient, use of the facility for expanding air ambulance services. The question is how to accomplish that.

The ferry option requires the construction of larger modern vessels to adhere to increasingly more strenuous Coast Guard standards. A more recent investigation of the ferry option indicated that a new, larger ferry could be functionally obsolete the instant it is pressed into service because of increased goods movement and ambulance space demands, greater capacity, and longer embarking and disembarking times affecting passenger service capabilities. A new ferry built to accommodate future needs could itself account for 30 percent of the distance it is supposed to traverse. Although it would require the lowest initial capital outlay, it would entail a continued commitment to operating subsidies. It also would not improve access.

Land use considerations derived from an ongoing analysis of access property requirements, coupled with further waterfront and airport development, suggest that a tunnel option would be advantageous, because it is least space-extensive. A low-level bridge option or lift bridge is impractical given the amount of recreational boat traffic in the western gap during summer. The lift bridge would have to be manned, adding to its costs; being mechanical, it would be subject to breakdown as well. A high-level bridge consumes too much land and is aesthetically unacceptable.

The tunnel option provides the most superior level of service, albeit at a premium price. Even the tunnel option is fraught with design complications, though. Currently the St. Lawrence Seaway depth provisions would need to be maintained for watercraft in the western gap. This would present considerable grades for tunnel traffic and add to the cost of such a facility. However, lowering those grades and not adhering to seaway depth provisions could result in negative environmental consequences with unknown mitigation costs.

Toronto Island residents are overwhelmingly opposed to a tunnel or bridge, insisting that it would destroy the integrity of the islands as an island, regardless of whatever conditions are attached to improved access.

Although it would be useful to take a proactive approach in this regard, political and financial realities are such that the demand for improved access cannot be definitively demonstrated in advance of the need to act, given present economic conditions, the fortunes of commercial operators at TIA, and the cost of alternatives.

The jurisdictional framework presents an added complication. The THC Board of Governors consists of five members: two are appointed by the federal government, and three are appointed by the city of Toronto and are from the local council. The interests of the THC and those of area residents may be quite opposed, presenting a problem for an elected official appointed to the THC who must represent both interests. Although councillors who are board members have argued that their participation can improve the accountability of the THC, a recent independent study of port operations was concerned enough to recommend a new approach to the

role of the THC board and the removal of political considerations from port decision making (10).

In addition, the municipality of metropolitan Toronto, representing the regional interest, and the province of Ontario, which has been temporarily responsible for the subsidization of access, have no control or say as to how the airport is run; Transport Canada, the federal agency, is principally concerned about the adequacy and cost of airside operations. As such, passenger handling pressures or the continuation of high ferry deficit levels would have to be in evidence for some time before a preferred access option would receive serious attention and could be justified on both political and cost/technical grounds.

Emphasis may be renewed for improving ferry access in light of the recent fatal crash of a light plane short of the airport's runway in January 1992. It took only 7 min for an ambulance to reach the accident site via the ferry—a commendable level of response. The rapidness of this action was a function of the alertness of and interaction among the pilot, control tower, ferry personnel, and emergency response authorities.

However, after disaster response exercises conducted in 1987 and 1991, emergency response personnel expressed concern that in a worst-case scenario, their efforts could be compromised by the ferry's operating deficiencies.

Indeed, given the location and quantity of downtown stationed ambulances and the vehicular capacity of the ferry, it could conceivably take a hour to transport all casualties (if necessary) from a fully loaded commuter aircraft downed at the airport to downtown hospitals.

In the opinion of emergency response agencies, the ferry working at 100 percent efficiency provides adequate support under normal conditions. With the ferry inoperative or unable to carry emergency response vehicles, the consequences would be significant in a worst-case scenario. Not surprisingly, a tunnel is the preferred option of emergency response agencies.

THC, through the creation of an airport community relations committee, has made considerable strides in (a) persuading area residents to understand and try to accept the airport, and (b) encouraging general aviation and commercial operators to accept and respect each other's competing needs and those of area residents.

It is difficult to forecast what will take place in the near future given traditional suspicions between the respective participants in the process. The continuation of such openness, coupled with guarantees of a cap on airport operation and with acceptable access restrictions, could allow an improved fixed link option, if it is affordable, to proceed with a reasonable chance of success later in this decade.

On the other hand, island residents have a very entrenched dislike of TIA, evident by the fact that a disproportionate amount (97 percent) of noise and overflight complaints (valid and otherwise) to the airport originate from that community—80 percent from four households—compared to a much larger population, within the same distance, to the immediate north of the airport (TIA, unpublished data). Much work is still required to continue to stem the polarization that characterized earlier internal and external relationships at TIA.

The safety of the Canadian traveling public is of paramount interest. Resolution of the differences and conflicts is being attempted through meetings with the community and the various levels of government.

ACKNOWLEDGMENTS

The authors wish to acknowledge the considerable efforts of individuals within THC and the Ontario Ministry of Transport who assisted in the development of the paper, particularly B. Turner, A. Home, B. Guest, H. Anders, and P. Dimitrou.

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The views of the paper are those of the authors and in no way reflect the position of either the THC or the Ontario Ministry of Transport.