AN AIRPORT MANAGEMENT METHOD
FOR CANADA IN THE 1990'S:
LESSONS FROM THE CANADIAN
AND AMERICAN EXPERIENCE

BY

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to the required standard

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MAY 1988

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ABSTRACT

During the last forty years metropolitan airports in Canada have been controlled by a federal authority and managed with a minimum of input from local sources. The situation under which this control was first initiated has changed radically since that time; a shrinking world combined with greatly increased traffic means that airports require more efficient planning and management of resources than in the past when they were not effectively integrated into an urban planning scheme.

The thesis examines the effectiveness of airport management using five criteria: the implementation of a national aviation policy, the administration of technology and aviation growth, the acquisition of funds for airport development, the effect of political suasion on airport management and the balancing of airport management goals and community goals. Several models of airport management from both Canada and the United States are used. The main aim is to show how decentralization of airport management is necessary to meet late-twentieth century and future demands.

The research method for the thesis is a comparative analysis of airport management's effectiveness in Canada and the United States using the five criteria. The airports chosen for the thesis for both Canada and the United States represent the centres for moving seventy to eighty percent of the passenger traffic in these countries.

It is concluded that the present Canadian federal ministerial management
method has been unsuccessful in: implementing fully national aviation policies, responding effectively to the process of deregulation, reducing the political nature of development decisions at the airports, and providing funds for airport development where required.

While American methods of airport management furnish useful insights they can not be applied in the same way in Canada because of different political structures. Airports under municipal control risk domination by local political issues and ineffective integration into a national and international network.

The airport authority as an autonomous body offers the best structure for responding to the changing needs of a wide variety of users. The less partisan nature of the decision-making process of the airport authority would be a vast improvement over the ministerial approach for: implementation of a national aviation policy, the management of the process of deregulation, the elimination of unnecessary political intervention with airport decisions, and increased access to funds for airport development.
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CHAPTER ONE: CURRENT ISSUES IN AIRPORT MANAGEMENT

1.1 Management of Airports, Aviation and the Community

Over the last forty years, Canadian airports have been confronted with increasing demands on them. At the same time, they have been restricted in their respond to these demands by dwindling funds. In the 1980s, the two public bodies reviewing government operations (Nielsen Task Force 1983 and Macdonald Commission 1986) have reached important conclusions regarding the future of Canadian airports.

The Nielsen Task Force recommended a system of deregulation that would bring airports under local control with the exception of those essential to Canadian sovereignty. It strongly recommended that the federal government pursue opportunities for "divestiture of local management of federal airports". The two main reasons for this recommendation were; first, to decrease the government's expenditures on airport development, and second, to promote a more economical, self-sufficient, air transportation system. Three years later the Macdonald Commission on the economy also recommended the federal government make substantial changes to the structure and management of airports.

The deregulation of the domestic airline industry in the U.S. since 1978 has resulted in less regulation for airlines worldwide. As a result of deregulation airlines have lost guaranteed fare increases in the 1980s and must focus on being more cost effective. This change in

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airline management's focus has had direct effects on airport operations. For example, the airlines are creating very different route structures from those existing prior to 1978. Most airlines in the U.S. and in Canada are creating route configurations in a "hub-and-spoke" pattern as opposed to the earlier "point to point" non-stop routes. The importance of this change is that the new hub-and-spoke system creates enormous demands on the hub airports for gates, runway capacity, parking, and concessions. At the same time, this system reduces demands or eliminate the need for other airports.

Airline operators and consumers suggest that the present centralized airport management system in Canada has not responded effectively to these changes. This has led to congested terminals and runways at major airports. Centralization of management also hinders the availability of funds for airport development at major metropolitan airports.

Airports are the largest land users on the urban periphery. The surface area of Dallas/Ft.Worth Regional Airport is as large as the city of Dallas itself. Mirabel International Airport at 88,000 acres is more than twice the size of the entire city of Montreal (Appendix 1 Table 1). In addition, the impacts of airports do not end at their physical borders. In Seattle, the Port Authority is in the process of spending $150 million dollars over the next 15 years on their Noise Remedy Program (NRP), to mitigate the negative environmental impacts on

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Remedy Program (NRP), to mitigate the negative environmental impacts on residents in the vicinity of Seattle/Tacoma Airport. In Chicago, the Department of Aviation is being persuaded by a coalition of suburban municipalities to decrease the noise created by hubbing operations at O'Hare airport which affect over 300,000 people.

Current federal airport management in Canada has been criticized for not recognizing these land use issues when developing an airport. The Ashford study, National Resources and Urban Policy, concluded that airports invariably alter the character of adjacent communities, largely because of the costs related to aircraft noise, safety concerns, and increased ground traffic flows.

The Canadian federal government has exclusive control over airport management at large metropolitan airports. Airport management must be ready to anticipate and act upon changing consumer demands, while maintaining security and safety standards. Transport Canada makes all decisions for an airport's location, size, access, and growth under the

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3 Guest Speaker, CANADIAN INSTITUTE OF PLANNERS CONFERENCE, July, 22 1986.


Aeronautics Act 1923 and the National Transportation Act 1967. This arrangement has been criticized by municipal administrations and community groups for not effectively including them in decisions made by airport management about airport development.6 This thesis describes how airport management and community goals can be balanced for Canadian airport development.

Federal government expenditures on transportation have increased greatly since Confederation. In 1986, Transport Canada and the Canadian Transport Commission (CTC) accounted for over 22,000 employees and spent about $5.5 billion.7 They also generated approximately $700 million in federal revenues. The expenditures on Air Transport Operations accounted for slightly more than 53% of total person-years and 20% of the net funds ($1.1 Billion) for Transport Canada (see Appendix 1:Figures 1 & 2). The above sums do not include other federal expenditures on transportation, such as those for northern development, or those by various crown corporations; ie. Air Canada, Canadian


National, VIA Rail, and CN Marine.

In recent years, the federal spending on transportation and communication as a percentage of total federal expenditure has steadily declined from 7.3% in 1974 to 5.3% in 1982. Deregulation and privatization are also part of the government's plan to reduce expenditures on transportation. Other countries, Australia, U.K., U.S., and India, in an effort to reduce their government expenditures on transportation, have also adopted deregulation and privatization legislation in recent years.

If the current airport management framework in Canada is to be changed, what should be the new structure? Should it be a federal crown corporation, a provincial crown corporation, a municipal department of aviation or an airport authority? How can these alternatives be weighed one against the other? These discussions and observations lead to the following proposition:

\[\text{to determine whether management of metropolitan airports in Canada requires a less or more centralized structure in order to succeed in operating these airports effectively.}\]

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1.2 Purpose and Scope

The purpose of this thesis is to examine the effectiveness of airport management structures using the following five variables:

1. effective implementation of national aviation policy,
2. managing aviation growth cycles & technological change,
3. securing funds for development,
4. minimizing the influence of political suasion and,
5. balancing airport management and community goals.

The thesis will examine in detail the following four airport management structures:

1. as a Federal Ministry (using Transport Canada as the example),
2. as a municipal department (using American examples),
3. as a municipal commission (using American examples), and
4. as an airport authority model (using the American example).

This thesis is, in effect, a comparison of Canadian and U.S. approaches to airport management. It examines the Canadian experience through the management of the Self-Sufficient Airports (SSA) as defined in Section 1.4. Eleven airports in eight U.S. metropolitan areas are also included. They were chosen to reflect different airport structures as defined in Section 1.4.

The period of 1960 to 1986 is the focus of this study. A condensed historical overview of aviation development from 1900 until 1960 will be included. The overview provides a summary of information for the reader who is unfamiliar with aviation history. Finally, lessons and options for the planning and managing of Canadian airports in the future will be derived from this thesis. The method of analysis is explained in
Section 1.3.

1.3 Method of Research

The research method is a comparative analysis of Canadian and American airport management experiences. The historical information for Canada, and the U.S. is derived primarily from aviation journals, books, articles and academic studies. The recent developments in airport management in Canada and the U.S. are difficult to obtain from written sources. A recent work term for the author with Transport Canada (Air Division - Vancouver International Airport, May-Sept 1985), and attendance at several recent conferences on airport management, provided additional information on discussions and views of aviation and government officials.
The Canadian and American experiences of airport management are measured using the five variables identified in Section 1.2 in the following manner:

1. the implementation of government policy appraises how well airport management complied with specific policies and what impacts these policies had on airport operations,

2. the management of passenger growth cycles and technological change measures management's ability to anticipate, plan and administer these cycles,

3. the acquisition of funds reflects the success of different processes of management methods to obtain funds as required,

4. the degree of influence of political suasion on airport management decisions is measured using the nine factors defined by Stanbury and Fulton, and,

5. the balancing of airport goals and community goals is measured by the timing and variety of options presented by management for development that were proven acceptable to both.

1.4 Research Airports: Definition

This thesis focusses on passenger traffic at major metropolitan airports. Cargo developments though an important and growing activity at major airports are not included because of time and resource limitations.

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9. This idea is derived from Stanbury and Fulton in their work titled "Suasion as a Governing Instrument" which is contained in Alan Maslove's book, *How Ottawa Spends Money* 1984: The New Agenda, pp. 282-324, Methuen: Toronto 1984. The authors used a set of elements: targetability, speed of implementation, flexibility, the fog factor, symbolism in action, ideological content, accountability, social costs, and the organizational goals of different actors, as indicators of suasion to examine governments use of suasion to alter the behaviour of the private sector. In this study of airports the same set of elements are useful in examining how the government uses suasion within government to obtain certain decisions and actions.
In Canada only the federal airport management structure of the Canadian Air Transport Administration (CATA) is examined. It was renamed the Airport Authority Group (AAG) after October 1985. The AAG as of October 1986 was responsible for the following nine federally owned and operated Self-Sufficient Airports (SSA) group:

<table>
<thead>
<tr>
<th>CITY</th>
<th>AIRPORTS</th>
<th>MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALIFAX</td>
<td>Halifax</td>
<td>Transport Canada</td>
</tr>
<tr>
<td>MONTREAL</td>
<td>Mirabel</td>
<td>&quot;</td>
</tr>
<tr>
<td>TORONTO</td>
<td>Pearson</td>
<td>&quot;</td>
</tr>
<tr>
<td>WINNIPEG</td>
<td>Winnipeg</td>
<td>&quot;</td>
</tr>
<tr>
<td>EDMONTON</td>
<td>Edmonton</td>
<td>&quot;</td>
</tr>
<tr>
<td>CALGARY</td>
<td>Calgary</td>
<td>&quot;</td>
</tr>
<tr>
<td>VANCOUVER</td>
<td>Vancouver</td>
<td>&quot;</td>
</tr>
<tr>
<td>MONTREAL</td>
<td>Dorval</td>
<td>&quot;</td>
</tr>
<tr>
<td>OTTAWA</td>
<td>Ottawa</td>
<td>&quot;</td>
</tr>
</tbody>
</table>

In 1985, the SSA group handled 80% (37 million) of the air passengers in Canada and produced 81% of the total revenue. They also collectively produced a cash surplus of $87 million (see Appendix 1, Map 1 and Appendix 3 for details).

In 1984, out of 15,000 airports in the United States only 3203 airports were open to the public. Of the 3203 public airports only 560 (17%) have scheduled airline service, commuters or taxi operations. This thesis concentrates on one category of the four category system of publicly-owned airports; the Air Carrier Airports. The Air Carrier Airports are those served by certified carriers. These airports are some of the busiest in the United States (ie. Atlanta & Chicago-O'Hare) to medium levels of activity (ie. Seattle).

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This thesis will review three of the American airport management methods (City Department, City Commission and the Airport Authority model) in eight different U.S. metropolitan areas:

<table>
<thead>
<tr>
<th>CITY</th>
<th>AIRPORTS</th>
<th>MANAGEMENT SYSTEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATLANTA</td>
<td>Hartfield</td>
<td>City-Department</td>
</tr>
<tr>
<td>CHICAGO</td>
<td>O'Hare Airport</td>
<td>City-Department</td>
</tr>
<tr>
<td>DALLAS</td>
<td>Dallas-Ft. Worth</td>
<td>Joint City-Dept</td>
</tr>
<tr>
<td>DENVER</td>
<td>Stapleton</td>
<td>City/County-Dept</td>
</tr>
<tr>
<td>LOS ANGELES</td>
<td>Los Angeles International</td>
<td>City-Commission</td>
</tr>
<tr>
<td>NEW YORK</td>
<td>JFK/LaGuardia/Newark</td>
<td>Airport Authority</td>
</tr>
<tr>
<td>SEATTLE</td>
<td>Seattle-Tacoma Intl</td>
<td>Airport Authority</td>
</tr>
<tr>
<td>WASHINGTON DC</td>
<td>National and Dulles</td>
<td>Airport Authority</td>
</tr>
</tbody>
</table>

In 1984, these eleven airports handled approximately 279 million passengers which accounted for 70% of the total 400 million passengers moved in the United States. If their current relative role remains unchanged, these eleven airports will handle 490 million passengers of the 700 million passengers forecast by the FAA to be moved through American airports by 1997. This would represent a 75% increase in usage and may be even higher for airports such as Denver, Atlanta, Dallas and Chicago as major airlines (United, Continental, American, Delta & Eastern) are increasing their hubbing activities at these locations. Appendix 1 Table 1 provides further statistical information on these airports and the cities they serve.

1.5 **Thesis Organization**

The organization of the thesis is as follows:

Chapter Two details the development of airports and aviation policy in Canada from the early 1900s up until 1986. This chapter also outlines the ministerial method of airport management in Canada. The success of the management structure is evaluated with respect to the five criteria outlined in Section 1.3.

Chapter Three presents the development of airports and aviation policy in the United States from the 1920s up until 1986. This chapter analyzes the three American airport management methods outlined in section 1.3. The success of each of these methods is also evaluated with respect to the five criteria outlined in section 1.3.

Chapter Four summarizes the success of the four methods into a comparative matrix, draws conclusions on how airport management should operate in the future based on this information and makes recommendations based on the preceding material. This chapter will also provide a brief discussion on the implications of implementing the recommended method of airport management for Canada.
CHAPTER TWO: CANADA'S EXPERIENCE IN AIRPORT MANAGEMENT

2.1  Canadian Aviation History 1900-1960

2.1.0  Constitutional Jurisdiction.

The British North American Act (BNA) does not place jurisdiction for transportation or communications directly with either the Federal parliament or Provincial legislatures.¹ Federal jurisdiction of transportation and communication is based primarily on subsections 92(10) and 91(29) of the BNA, and on the preamble of Section 91 of that Act to make laws for the "peace, order and good government of Canada".² These residual powers of the BNA have been interpreted by the courts as granting the Parliament of Canada exclusive jurisdiction over the development of air transportation. The Supreme Court of Canada ruled in Johannesson v. West St. Paul (1957) that aeronautics was a matter "... beyond local or provincial concern or interests and must from its inherent nature be the concern of the dominion as a whole".³ Exclusive federal jurisdiction in aeronautics has resulted in a single level of government regulating the development of a national system of air services.


² Ibid, p.140.

³ Ibid, p. 149.
The constitutional position for federal control over airports has been made clear by several court decisions. It is clear from the Unemployment Insurance Reference A.G. Can. v. A.G. Ont. [1973] A.C. 355, that the permanent delegation of powers from the federal to the provincial government is unconstitutional. This decision was affirmed in 1950 in A.G. Nova Scotia v. A.G. Can [1951] SCR 31. The court held that the permanent decentralization of power would disturb the distribution of powers set down in the ENA Act and since decentralization was not expressly provided for none would be implied.

The Federal Government is reluctant to create a true airport authority similar to the American example because of its concern for exposure to constitutional challenges. Any attempt to delegate to the provinces any of these powers would likely be faced with this challenge. That is not to say that an authority that allows local municipal participation could not be created but rather in doing so great care must be taken in structuring the commission. Proper legislation must be implemented in compliance with the Constitutional reform formula for the new management structure to be created.

2.1.1 Canada 1900-1919: The Formative Years.

Early aviation in Canada could exist without airport facilities. Douglas McCurdy designed, built and flew his own aircraft in Baddeck Bay, Nova Scotia February 23 1909.\textsuperscript{4} The aviation industry grew very

\textsuperscript{4} Smith Donald J. et al., Airport Planning and Management, Wadsworth Publishing Company, Belmont Ca., 1982, p. 17.
slowly in the early 1900s as there was no perceived social or economic value to the activity. The elementary nature of equipment also required very little in the sense of airports since they utilized either water or grassy fields for landing and taking off.

World War I stimulated the growth of aviation in Canada. Part of this grew out of the activities of the training schools established by the British Royal Flying Corps across Canada. Public funds through the military assisted major advancements in aircraft technology to improve their reliability and safety. There was a corresponding increase in airport construction for training centers through 1915-1917. In 1918, with the end of World War I, there were many trained pilots who could turn their skills to commercial aviation and the development of northern Canada. As this industry expanded with the country's needs for exploring remote areas for mineral deposits, the federal government realized that regulation was needed.

The Air Board Act of, June 9 1919\(^5\), established an Air Board with broad-based powers of regulation over all forms of aeronautics. The Board originally had four distinct branches;

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1) A secretary's branch, which dealt with organizational, financial, staff, and departmental duties.
2) A certificates branch, which dealt with the licensing of aircraft & personnel.
3) A flying operations branch, which conducted any flying operations required for other government services.
4) A technical branch.  

Note that in none of these branches was any consideration given to airports. The reason for this, since most aircraft still only required a grassy field or body of water to land and take off from, there was no need for regulation of how airports should be constructed. The few existing airports from World War I became the responsibility of the Air Board and were to be utilized as training centers under its certifications and technical branches.

2.1.2 Canada 1920-1929: Governments First Steps.

In 1923 the Air Board Act was replaced by the Aeronautics Act.  

The new act placed the responsibility for aviation with the Minister of Militia and Defense. Through the 1920s, as more uses for the aviation industry became apparent (ie. mapping, forest protection, and increasing mineral exploration), there was a corresponding increased need for airports. The establishment of regional air services in the 1920s by provincial governments also required airport development.

Joint cooperation between, federal, provincial, and municipal


7 Ibid, p. 20.
governments helped to develop and establish airports across the country to meet these needs. However, these facilities did not represent a system of airports because they were built to different standards and only in areas where various projects required an airport.

Major government funds were required by the Civil Aviation Branch of the Aeronautics Board in 1927 to overcome two major problems; standardizing airport facilities and creating a safe airway. Interest in supplying these facilities had grown among Chambers of Commerce, flying clubs, and fledgling airlines, because of the growing success of intercity mail services in the United States provided by the terms of the American Airmail Act 1925. The federal government decided that they could not afford to build airports in every city but knew they had to take action or the American airlines would apply for moving mail via the American airway system.

In 1927, the federal government passed the Flying Club Policy Act to prevent American domination of the Canadian airways, and as part of the solution for providing airports. This policy was a capital incentive program for the development of airports. The federal government would provide two biplanes to every community that provided the services of an instructor, an air engineer, a licensed aerodrome, and a hanger for maintenance & storage. If any of these flying clubs in subsequent years purchased one aircraft (of an approved type) from its own resources, the federal government would provide an additional aircraft. Sixteen

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private flying clubs were formed in 1928 and seven more in 1929, which substantially boosting the inventory of airports in Canada.9

In 1928, as a response to the second problem of creating a safe and reliable airway, the federal government enacted the Trans-Canada Airway Act.10 This was the first major specific legislation with respect to airport development because the plan called for the construction of airports at 100 mile intervals. These airports would be equipped with runway lights, lighted beacons (for night navigation), radio range communications, hangers and maintenance facilities. In addition to these expenditures, to enhance safety, emergency landing strips were constructed at 30 mile intervals between the main airports.11

2.1.3 Canada 1930 - 1939: The Depression Years.

Although many airlines experienced losses or bankruptcies during the Depression years, airport development increased. Between 1932-36 the federal government built fifty new airports through "make work" projects.

In the 1930s, the federal government reevaluated which department should be responsible for aviation matters. The responsibilities for airways and airport regulations were removed from the Militia and Defense department and placed under a new separate civil department. On November 1 1936, Parliament established the Department of Transport

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10 Ibid, p. 22.
11 Ibid, p. 22.
with the task of administering aviation, railways, canals, marine, and highway services. All modes of transportation were included to enable consistent policy development ensuring complementary modal development that would contribute to a national system of transportation.

A brief examination of the aviation industry in the 1930s shows that not all was going to plan. Even with the standing offer granted by the federal governments Flying Club Policy Act, by 1936 the Trans-Canada Airway was still uncompleted because, many municipalities could not justify the expenditures required. As a result of this the federal government decided to build and operate several airports to ensure the completion of the Trans Canada Airway.

In conjunction with this development, the Minister of Transport in 1936 saw the necessity for a transcontinental air carrier to coordinate air services. The minister's first proposal offered a private company, Canadian Airways Limited, the opportunity to become that airline. Canadian Airways Limited was owned by the Canadian Pacific Railway. This proposal was unsuccessful because Canadian Pacific refused to contribute 50% of the capital required unless it was made an equal partners in the new airline company, something which the federal government refused to do.13

On the Minister's recommendation in 1937 Parliament past the Trans-Canada Airway.

12 Ibid, p. 23.

Canada Airlines Act, and created a public transcontinental air carrier called Trans-Canada Airlines (TCA). The Trans-Canada Airlines Act gave Trans-Canada Airlines a monopoly on transcontinental air services in Canada between 1937 and 1967.14

2.1.4 Canada 1939 - 1945: World War II.
The outbreak of World War II created a tremendous growth in airport construction in Canada. There were over eighty airports constructed in a period of two and half years.15 Most of these airports were for military use since Canada was the base for the British Commonwealth Air Training Plan and a major participant in military projects with the United States. Canada assisted the U.S. with the Crimson Route (Europe via the Arctic) and the Northwest Staging Route (via Alaska) by developing airports on these routes.16

Several major government decisions during the war years set the stage for postwar development of airports:

1) A large amount of land was purchased and set aside for future aerodrome development.
2) Air traffic control within a radius of twenty miles of major aerodromes began in 1940.
3) Airways air traffic control came into operations in 1942.
4) The Air Transport Board, created in 1944, was made responsible to the Minister of Transport. Its function was to review,


15 Ibid, p. 25.

approve or refuse licenses for commercial air services.\textsuperscript{17}

All of these factors displayed the federal government's commitment for postwar civil aviation development.

A policy decision by the federal government for large expenditures on airports was announced by the Prime Minister of Canada at the closing of World War II;

\begin{quote}
The Canadian Government strongly favors a policy of international collaboration and cooperation in air transport and is prepared to support in international air transport policy can be demonstrated as being best calculated to serve not only the immediate national interest of Canada but also our overriding interest in the establishment of international order which will prevent the outbreak of another world war.\textsuperscript{18}
\end{quote}

This statement committed Canada to upgrade its airports to an international standard. In November 1944 the Western allies held a conference in Chicago and created the International Civil Aviation Organization (ICAO) to establish international standards for aviation development. Since Montreal was chosen as the headquarters for ICAO, access to Canada by modern air services was essential and this required Canada to live up to the standards set by ICAO.

2.1.5 Canada 1950 - 1960: Airport Development & Suburbanization.

The suburbanization of Canada in the 1950s was an important trend in


\textsuperscript{18} Ibid, p. 26.
determining land use patterns in urban areas. This trend sparked a tremendous growth in infrastructures systems (ie. Roads, transit, sewage, electricity, telephone services, schools, hospitals, etc.) in Canadian cities. The financial commitment for infrastructure development of the suburbs prevented many municipalities from updating airports to the international service levels required by the federal government commitment to the ICAO standards.

To achieve the ICAO standards, the federal government purchased several municipal airports across Canada to upgrade to these standards. Many of these airports required extensive work (ie. Customs, Health & Immigration, Agriculture officers) to fulfill their international role. The federal government's Minister of Transport was responsible for the planning, designing and developing of these airports.

Gander International Airport in Newfoundland was the first major Canadian international airport, however a change in aircraft technology made it technologically obsolete. The change from the DC-7 and other turboprop driven aircraft to the DC-8 and Boeing 707 jet-engine technology (1958), gave the airlines increased range without the need for fuel stops in Gander (Appendix 1 Table 2). The first planned international airport in Canada specifically designed for jet technology was Montreal Dorval International Airport opened in 1960.\(^{19}\)

The federal government's airport development program continued into the

\(^{19}\) Smith Donald J. et al., Airport Planning and Management, Wadsworth Publishing Company, Belmont Ca., 1984, p. 24.
1960s. Malton Airport (present day Pearson International) was built by the City of Toronto in the late 1930s but was purchased by the federal government in 1955. In the late 1950s the Ministry of Transport expropriated an additional 3,000 acres of farm land adjacent to Pearson International and spent $20 million on runway and terminal improvements. Vancouver's original airport was also built by the city in the 1930s but was purchased by the Ministry of Transport in 1962 when faced with the major financial commitments required to upgrade the facility to ICAO and jet aircraft standards.

Advancements in the aviation industry in the fifty years between 1910-1960 created many technological and administrative changes in airport operations. Even greater technological and administrative reforms for both airlines and airport operations would occur between 1960-1985. Section 2.2 summarizes the major reforms between 1960-1985.

2.2.0 Traditional Role of Government & Airport Development.

Traditionally the nationwide system of Canadian airports was operated by the Ministry of Transport with the main objective of being responsive to the aviation needs and interests of the public and private sectors in the economy.

There is no specific "Canadian Airport Act" such as exists in the United States with the Airport and Airway Development Act (1982) and the Airport and Airway Revenue Act (1982) and in Australia with the Federal Airports Corporation Act (March 1986), or as exists in the United Kingdom with the British Airports Authority legislation (1965). Instead, in Canada, there are several pieces of federal legislation which apply to airports. The major ones are; the Aeronautics Act & Amendments 1977, the National Transportation Act 1967, and the Financial Administration Act, amended in 1977. 20 Sections 2.1.0 to 2.1.6 of this thesis outline several other government policies and actions which impact on airport development in Canada.

2.2.1 Royal Commission on Transportation Policy – 1961.

In 1961 Parliament established a Royal Commission to carry out a detailed review of transportation policy in Canada. During the early 1960s as a result of this review, there were several major policy and

legislative changes which affected air transportation:

1) The new National Transportation Act (NTA) became law in 1967. This act was designed to regulate all modes of transportation within federal jurisdiction and identified as its objectives; 'An economic, efficient, and adequate transportation system making the best use of all available modes of transportation modes at the lowest total cost is essential to protect the interests of users of transportation and to maintain the economic well-being and growth of Canada and that these objectives are most likely to be achieved when all modes of transport are able to compete.'

2) The Cost Recovery Policy (users pay) announced by the Minister of Transport, which in broad terms stated; 'Airport and en-route costs will be fully recovered, except for costs to be assumed by the Government for the implementation of a particular Government policy requiring departure from the objective of commercial viability.'

3) The Air Canada Act of 1964 incorporated the airline and changed the name from Trans-Canada Airlines to Air Canada.

4) The Regional Air Carrier Policy of 1966 provided the five regional air carriers with regular route operations to supplement the two domestic mainline carriers, Air Canada and CP Air.21

There were several direct and indirect effects of these policy changes on airport development.

The NTA called for major reforms in all modes of transportation with a focus on economic objectives because of the federal government's concern

over providing funds to so many areas of transportation. This was a major departure from government aviation policies and actions of the 1930-1967 era, when the government was increasing program funds to provide airport and airway facilities (see Section 2.1).

The Cost Recovery Policy directive made it clear to CATA that users of the air mode should pay for the use of the facilities and that the airports should operate debt free. This directive, for the first time in nearly fifty years of government operation, was requiring the government to make airports financially self-sufficient.

The Air Canada Act and the Regional Air Carrier Policy redefined the areas of operation of the major and regional air carriers. The 1960s witnessed the beginning of major charter operations (ie. Wardair - Europe and Florida, Nordair - Florida & Caribbean). The Regional Air Carrier Policy allowed the regional carriers to purchase new jet equipment (ie. 737s and 727s) to operate on new routes. These changes in airline operations increased the demands on airport capacity to process more flights and the larger aircraft for both the major and regional air carriers.

Between 1975-80 all the forecasts by the Ministry of Transport predicted large increases in passenger traffic well into the twenty-first century. These forecasts were the rationale for new and larger facilities to be constructed across the country.
In the early 1970s the federal government continued an airport expansion program, as a continued commitment to the development of international airports in Canada, and to meet the increasing demands for airport services. In Toronto by 1975, 18,000 acres were expropriated at a cost of $146 million for a planned new international airport at Pickering.\(^{22}\)

In Quebec in 1969/70, at a cost of $400 million, Montreal's second international airport was located at Mirabel on an 88,000 acre site thirty-four miles from downtown Montreal (opened in November 1975).\(^{23}\) Smaller expenditures were also incurred in Winnipeg and Vancouver for new terminals and airside improvements.

By the late 1970s, the federal government was concerned with its growing expenditures to create a system of international airports. In 1979 the federal government formed a Task Force to review government airport management policies and goals. As a major outcome of this Task Force, the Airport Revolving Fund was expanded from its original two airports to include twenty-three airports in total. The airports included were:

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This restructuring of the Airport Revolving Fund was done in an attempt to cover costs of more airports by creating a pool for lending money from the more profitable airports to others. This new source of funds for airport operations would reduce expenditures from the federal government's treasury which was the only other source for funds.

The Task Force (1979) also found that, the Minister of Transport, and CATA were being criticized on their abilities to manage Canadian airports. The users of airports (airlines and the travelling public) plus local governments had complained that airport administration was unresponsive to their needs or concerns. The centralization of decision-making authority in the headquarters of CATA in Ottawa had made the system cumbersome, and inefficient, necessitating the approval from Ottawa for any major managerial decisions at the local airport.24

The problem of centralized decision-making can be illustrated in the following example discussed in David Varty's article (1979).25 When

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25 Ibid, pg. 360, interview with Lorne Howell, General Manager, Vancouver International Airport.
there is a ministerial change in Ottawa or when there is a change in government, important projects at the airports may be halted until the new political staff is familiar with the particular decision. For example, when the Clark government was elected, it initiated a freeze on spending until it had made an assessment of the direction in which it intended to go. This meant that Vancouver airport had to stop when half finished a $34 million renovation to await the government release of frozen funds. This occurred while the airport was experiencing a 15% increase in passenger volumes.

2.2.3 Airport Development & Environmental Concerns - 1975-80.

The late 1970s and early 1980s was a period of increased environmental awareness in our urban regions over; air, water and noise pollution. The concerns over noise pollution focussed heavily on aircraft noise as oppose to highway or industrial noise, thereby creating a negative stereotype of an airports proximity to other land uses especially residential areas. In fact this environmental movement in, Canada, Australia and the U.S., was a major cause for the banning of the supersonic aircraft, Concorde, from many of the airports in these countries.

A program response to the noise pollution issue in Canada was the establishment of new airports with "buffer zones" around them or to locate new airports in isolation from other urbanized areas of a city. These airports are also referred to as "environmental airports". Examples of this program are, the large purchase of land around Mirabel and the isolated location of the new Edmonton International airport.
from the urban center (Table 1 gives location of airports relative to the city centre).

2.2.4 Alberta Land Use Policy & Airport Development - 1978.
There is only one province in Canada to have taken action to reduce land use conflicts from developing in communities and cities served by an airport. The province of Alberta in 1978 enacted the Airport Vicinity Protection Area Program (AVPA), as part of the Alberta Planning Act (Section 147). The goals of the AVPA Program are two fold:

1) to minimize the adverse impact of aircraft operations, especially aircraft noise, on communities developing around airports, and
2) to maintain the continued viability of the airport facility at its optimum efficiency.26

The provincial government of Alberta has laid out an important process through the AVPA in coordinating airport development, municipal growth and environmental protection.

Although the planning and management of metropolitan airports still remains an exclusive federal responsibility, the provincial governments are responsible for other land use activities which service the airports (ie. road construction and infrastructure connections) and developments in the surrounding area (ie. municipal zoning).

2.2.5 Liberalization of Airline Regulations - 1984.

26 Guffi Ross (Senior Planner Municipal Affairs Alberta), lecture on the AVPA Guideline Process, CANADIAN INSTITUTE OF PLANNERS (CIP) CONFERENCE, July 22 1986, Vancouver 1986.
In 1984 the Minister of Transport released a discussion paper on the liberalization of airline regulation. This was in response to the deregulation of the U.S. airlines in 1978, and to curb the rising expenditures by the federal government on transportation infrastructure. In that discussion paper the Minister expressed key changes in regulatory measures by the federal government over the airline industry:

It demonstrates the government's confidence in the maturity of Canada's airline industry to respond to the challenges of increased competition. This policy discards the concept that the airline industry is a public utility.27

(emphasis added by author)

For the first time in the fifty year history of regulation of the airline industry, the government had decided the industry no longer needed government protection as an "infant" industry and that it was no longer a public utility.

The minister also commented on the role of Canadian airports:

The heavy public investment we make in airports each year means we must make the most productive use possible of our infrastructure. There is an undeniable case for an initiative to promote increased services at our underutilized airports.\footnote{Ibid, p. 8.}

(emphasis added by author)

In 1984, the Liberal government was defeated but the new Conservative government was committed to similar reforms and took further action to reduce airline regulation and increase airport utilization.

In 1985, the Conservative government released its objectives with respect to all modes of transportation regulation in a white paper called 'Freedom to Move; a framework for transportation reform'. Within this document the government was calling for substantially reduced regulation of the transportation industry, inter and intra-modal competition, and increased self-sufficiency.

As a result of the above white paper, deregulation of the airlines has occurred in Canada, not by a change in legislation but simply by the federal government not enforcing the regulatory powers it was entitled to. The lack of enforcement of airline regulations has resulted in Canadian airlines rapidly building hub-&-spoke systems similar to their American counterparts.
The airports are caught in this deregulation and subsequent competition amongst the airlines with a management system which has failed to streamline quick enough to respond to the changing airline operations, and has had no substantial increases in their budget to keep pace with the demands to accommodate the airlines.


In fact, in addition to the Conservative government's interest in transportation reform in the private sector, a series of studies were established to review all government program expenditures in an attempt to reform the public sector. The "Royal Commission on the Economic Union and Development Prospects for Canada" document (Macdonald Commission 1985) and the "Nielsen Task Force on Program Review" (Sept 1985) both recommended the Federal government pursue opportunities for "divestiture or local management of federal airports".29

These reviews revealed that airline and concessionaire fees did not cover anywhere near the cost of providing these services. According to the Minister of Transport, in 1985 the government's cost recovery of maintaining and operating the airport transportation system, and air navigation system, was only slightly above 40%.30 In 1985 CATA was carrying a $777 million deficit for the air navigation network,


therefore the government taxes on passengers and fuel are increasing.\textsuperscript{31}

In 1985 also as an outcome of these reviews and in an attempt for the Self-Sufficient Airport Group (SSA) to achieve their goal of reaching self-sufficiency, the federal government reduced the number in the Revolving Fund mechanism from twenty-three to nine. The nine airports still in the Revolving Fund mechanism of the Self-Sufficiency Airport Group are; Vancouver, Edmonton, Calgary, Winnipeg, Toronto, Mirabel, Dorval, Ottawa and Halifax.

In addition to the above reviews, a new Task Force on Airport Management was formed in 1985 by the Minister of Transport to examine alternative methods for operating airports in a more economic, self-sufficient manner. The task force results were delivered in 1986 with major changes recommended to the structure of airport management in Canada but not offering methods or instructions as to how to achieve these changes.

The next section of this study will examine the reporting chain of the management structure of the Ministry of Transport's air division between 1960 and 1985.

\textsuperscript{31} ibid, p. 32.
2.3 Canadian Airport Management Structures.

2.3.0 Canadian Government Transportation Management Structures.

In Canada a ministerial method of management has been used for the management of major airports in Canada. The Canadian Air Transportation Administration (CATA) and the Airports Authority Group (AAG) have been the major bureaucratic bodies responsible for the planning, regulating, and operating airports. The Department of Transport was reorganized in 1969, for the first time since its establishment in 1937, as the Ministry of Transport. The new ministry was organized into three administrative branches: air, surface and marine. The air administration was given the title; Canadian Air Transportation Administration (CATA). The new ministerial method of management was to increase accountability and improve performance.

The AAG was created in October 1985 to replace CATA but has not resulted in any substantial change in operation from the CATA system. However, this action has given the Conservative government the image of creating change. Details of these systems will be outlined in this section.

2.3.1 Restructuring of Department of Transport - 1969.

CATA was responsible, up to 1985, for the provision of standards, licensing actions, procedures and regulations for the convenient, safe and efficient conduct of aeronautics in Canada. CATA was also

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responsible for the provision, operation and maintenance of many airports, navigational aids, airway systems, and other related facilities and services in support of aeronautics. CATA's primary objective was "to develop and operate a safe and efficient national civil air transportation system that contributed to the achievement of government objectives, and to specific elements of this system."\footnote{Ibid, p. 5.}

CATA was headed by the Air Administrator who reported to the Deputy Minister (Appendix 1 Organization Chart 1). CATA consisted of three levels of management; headquarters, regional offices (six in total), and local airport administration. The headquarters branch, consisted of six director generals, and was responsible for:

1) policy development and planning,
2) financial and personnel administration,
3) development and enforcement of aeronautics legislation, and
4) construction, operation and maintenance of federally owned airports.

The six regional offices, as the second level of management, were responsible for (Appendix 1 Organizational Chart 2):

1) directing administration of airports within their region,
2) directing future development plans (formulated at headquarters),
3) administering and controlling allotted financial resources,
4) directing personnel utilization, and
5) developing effective management of airport properties.

Local airport administration, as the third level of management, consisted of an airport manager and staff which handled the functional
consisted of an airport manager and staff which handled the functional areas of technical, operational and administrative services.\textsuperscript{34}

There were exceptions to the above noted reporting scheme, some of the managers of principal airports reported directly to the Regional Administrator (ie. Toronto, Mirabel & Dorval), rather than through the Regional Manager of Airports and Properties (Appendix 1 Organization Chart 1).

The CATA management method had no formal mechanism for input from the airlines, provincial or municipal governments in determining how the airport should be developed. The regional and local levels of CATA that operated the SSA group, have requested opinions from the airport users in the past, but they are not required to do this. In fact, there are several documented cases of quite the opposite, of where CATA tried to do too much without soliciting support or input from local government and airport users. A case in point was, the expropriation of the land for Pickering. This example and others will be discussed in further detail in Section 2.7.

The creation of the Airports Revolving Fund in 1969 was to increase the efficiency and operating methods of the two largest airports in Canada (Toronto and Montreal's Dorval).\textsuperscript{35} The Airport Revolving Fund involves pooling the operations and maintenance budgets of these two airports

\textsuperscript{34} Ibid, p. 6.

into a common fund. In 1979 CATA expanded the number of airports in the pool from two to twenty-three in an administrative effort to reduce the expanding demand on the government treasury for airport development funds by forcing cross-subsidization from the more profitable airports.

It is not possible for profitable airports in the Revolving Fund to use their profits to retire their own debts until the entire pool showed a profit. With twenty-three airports included in the Fund with a combined debt of $129,000,000 in 1978, it is impossible for any profitable airport to get ahead. Up until April 1985, the SSA group was financed by the Airports Revolving Fund as part of the 23 largest airports. With the creation of the Airport Authority Group (AAG) and the Air Navigation and Safety Group (ANS) in 1985, the Self-Sufficient Airport group was removed from the Revolving Fund.

2.3.2 Airport Authority Group (AAG) - 1985.

The growing inability of the CATA management structure to cope with growing traffic demands, deregulating airlines, and growing government expenditures, lead to the establishment of the Airport Authority Group (AAG) and the Air Navigation and Safety Group (ANS) in 1985. These two bodies divided the responsibility of the old CATA management structure. The ANS is responsible for the safe and efficient operation and maintenance of navigational aids, airways and runways.

The overall mandate of the AAG is to "operate the existing airport system of major airports in the most efficient, secure and safe manner, to maximize revenue generation opportunities and to develop
self-sufficiency at airports.""36 Its main objectives are to; "re-orient
the organization from one structure to manage on a functional basis
(CATA) to one structured on a line basis; place greater emphasis on
commercial development; incorporate a means of maturing airports to
promote managerial and financial self-sufficiency; and to accommodate
down-sizing initiatives."37

The AAG management method is quite different from the airport
authorities in the United States or the United Kingdom. Unlike the
American and British authorities, which have independence and enabling
legislation, the AAG is not independent from the federal ministry nor is
it set up under enabling legislation of local government. The AAG is an
attempt by the Ministry of Transport to streamline the ministerial
management structure of airports in Canada while still operating as part
of a federal bureaucracy.

However, the AAG is still structured the same as the CATA
administration, it has an Executive Director and five Director Generals
in headquarters, six Regional Director Generals for the same six regions
defined by CATA, and local airport administration. No efficiency in
management has been gained by this so-called changed in management. The
only advantage appears to be political, in the sense that the Canadian
federal government appears to be working on a solution to manage the
airports more efficiently.

36 Transport Canada, Deputy Minister Circular 86-04701-103, Ottawa,

The creation of the AAG was intended to "allow for faster decisions, more efficient systems and procedures, and flexibility to respond to local needs and opportunities, resulting in lower unit cost of air transportation for the public." The objective of the Headquarters branch of the AAG is to "consolidate like functions and activities, and to reflect clear lines of accountability throughout the organization." This objective is not unlike that for headquarters branch of CATA.

The reorganization of CATA into AAG has not resulted in these goals. In fact, the power for authorization has been even more centralized in the hands of the Director General at AAG Headquarters in Ottawa. The Director General's function is to serve as a focal point so that "this will centralize the airports planning and operating policy development activities." Even with deregulation being approved for the airlines, the reduction in federal spending on air transportation, and the stated interest in making airport's local management more independent, the federal government has centralized the responsibility for key decision making areas to the Director General (ie. planning & operations policy).

2.4 **Canadian Aviation Growth & Technology Changes.**

2.4.0 Impact of Technological Advancement on Airports.

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38 Ibid, p. 2.
40 Ibid, p. 3.
The primary user of the airport is the airline. This may seem obvious to most but it is important to be aware of what types of equipment airlines use and are contemplating so as to anticipate their demands on the airport. This section will show how successive changes in aircraft technology impacted on airport development.

The 1940s and 1950s were significant decades for airport development because of the limited range of aircraft equipment (Table 2: DC6 & DC-7). These aircraft required several stops for fuel and maintenance, thereby utilizing many of the airports established in the 1930s and 1940s by the Canada Airways Act.

The introduction of jet aircraft (Table 2: DC8, DC9, & 707) in the 1960s resulted in equipment with longer ranges which required fewer stops. Stops were more governed by government regulations as oppose to technological limitations. During the 1960s Air Canada as the national airline, implemented jet service to all of the major airports regardless of traffic demands. The heavier jet equipment required lengthened runways for take off and landing and upgraded loading bridges at all facilities.

In the 1970s with the introduction of the wide-body or "jumbo" aircraft (Table 2: DC10, L1011, & 747) the airports had to accommodate aircraft with huge increased capacity for passengers (from 707s with a 180 passenger capacity, to the 747s 400 passenger capacity). Most Canadian cities saw the Vanguard and DC9s being replaced with DC8s and 727s and some wide-body L1011 and 747 service in the 1970s. For example the
large increases in both passenger and aircraft movements experienced at Edmonton International Airport were mainly due to the fact of the limitations of equipment size and traffic volumes at the Edmonton Municipal Airport. Edmonton Municipal located in downtown Edmonton is limited to equipment smaller than 737s due to its restricted runway length.

The introduction of the newest Boeing 747-400 aircraft in 1985 with its "stretched" upper deck can accommodate up to 540 passengers. The 747-400 weighs over 850,000 lbs. and like past new generations of aircraft, will have definite impacts on Canadian airports. This new weight limit will require lengthening and strengthening of existing runways either immediately, or in the near future, depending on the runways present rating and how soon airlines plan to introduce the aircraft on Canadian routes.

Several airlines serving Canada have purchased the 747-400 or have it on order. They are: KLM Royal Dutch Airlines, Lufthansa, British Airways, Cathay Pacific Airways, and QANTAS. In addition to these, Singapore Airlines, CAAC, Korean Air, Northwest Orient, Swissair and UTA have placed orders. Several of these latter airline's host countries are either presently serving Canadian cities or are in negotiation with the federal government for landing rights in the near future.

Boeing, the manufacturer of the 747, surveyed large airports (author could not confirm if any Canadian cities included in this survey) and found that most could not accommodate an aircraft with a wingspan of
larger than 215 ft. for gate facilities. According to Jules Berger, the chief project engineer for the 747-400, at some airports gate, utilization will have to be carefully planned as two 747-400s may not fit side-by-side.

In the 1990s Boeing may introduce the 747-500 which would be a double-decker aircraft, having a crew of almost fifty and the upper deck stretched so that the two levels would accommodate 800 passengers. The 747-500 when constructed, will have a 253 ft. wing span and weigh over 1 million lbs. and therefore require gate space and runway modifications in future airport expansion plans. In this same decade the MD11 will enter service, which is the McDonnell Douglas wide-body replacement for the DC10. This equipment has kept its weight down, as well as its passenger capacity to within ranges presently accommodated at Canadian airports (see Table 2).

In addition to accommodating larger aircraft at airports, the rapid growth in "feeder" or "commuter" airlines has increased use of turboprop equipment at Canadian airports. Aircraft such as the Twin Otter, Dash 7, Dash 8, Metroliners, and other 10-50 passenger size aircraft are used by Canadian commuter airlines such as; Air BC, City Express, Time Air and Air Nova to name a few. Their size and frequency of service do not converge with the terminal designs of a jet terminal. Expenditures are required on terminal modifications so passengers can reach the aircraft on the tarmac level because the loading bridges for the larger jets can
not be used with the smaller aircraft.\textsuperscript{41}

The future developments of the UnDuct Fan (UDF) engine will also affect airport operations. This is an engine technology promising significant fuel savings (up to 40%) for the airline and therefore has generated a great deal of interest by the airlines. The UDF aircraft is presently being tested by both Boeing and McDonnell Douglas for aircraft of medium size (100-150 passengers). The major difference in design as discussed by Ken Remain is; "the engine looks like large propeller type engines but are mounted backwards."\textsuperscript{42} The concern for an airport is, these engines at present are significantly noisier than the jet engines. A noisier aircraft will cause problems with the surrounding community which airport management must resolve. At the time of this study the UDF aircraft engine is only in the testing stage so it is not possible to predict exactly when they may enter commercial use. Boeing is projecting the early 1990s as a possible production date for the UDF aircraft.

As shown in the preceding examples, the development of aircraft technology has influenced airport development. In the 1970s most of the major metropolitan airports in Canada were still developing their facilities to accommodate the jet aircraft of the 1960s (ie. DC-8s & 707s). Today, most of the SSA group are unable to easily integrate the

\textsuperscript{41} The Vancouver Sun. Cecil Foster. "Commuter carriers now most profitable in airline industry". Toronto, December 02 1985 B17 and The Financial Post. Mathew Horsman. "Quebecair sale to Nordair Metro leaves Air Canada out in the cold". Toronto, August 09 1986.

commuter airlines or the new generation of 747s because of present runway weight limits and inadequate gate designs. Canadian airport management's lack of foresight in technological advancement has lead to current airport deficiency which reduce their abilities to response to the travelling public and airline needs.


Canadian air passenger movements at all the eastern airports, in this thesis, increased between 1964 and 1980 (Appendix 1 Graphs 1). These airports, with the exception of Dorval and Halifax, all experienced a continuous rise in aircraft movements as well (Appendix 1 Graphs 5). Table I presents a summary of the percentage changes at eastern airports between 1964 and 1984.

Table I shows that the 1981-84 four-year average percentage changes for passenger traffic at Canadian airports has slowed tremendously from
### TABLE I

**CANADIAN EASTERN AIRPORTS**

**PASSENGER & AIRCRAFT MOVEMENTS**

<table>
<thead>
<tr>
<th>AIRPORT</th>
<th>VOLUME TOTALS 1964 (MILLIONS)</th>
<th>PERCENTAGE CHANGE</th>
<th>4-YEAR AVERAGE % CHANGE</th>
<th>PERCENTAGE CHANGE 1981-1984</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PASSENGERS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TORONTO</td>
<td>2.856</td>
<td>473</td>
<td>119</td>
<td>-3</td>
</tr>
<tr>
<td>MONTREAL</td>
<td>2.325</td>
<td>278</td>
<td>70</td>
<td>-14</td>
</tr>
<tr>
<td>(DORVAL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTTAWA</td>
<td>0.383</td>
<td>500</td>
<td>125</td>
<td>3</td>
</tr>
<tr>
<td>HALIFAX</td>
<td>0.324</td>
<td>473</td>
<td>119</td>
<td>5</td>
</tr>
<tr>
<td><strong>AIRCRAFT MOVEMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TORONTO</td>
<td>0.056</td>
<td>456</td>
<td>114</td>
<td>1</td>
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<tr>
<td>MONTREAL</td>
<td>0.054</td>
<td>318</td>
<td>80</td>
<td>-9</td>
</tr>
<tr>
<td>(DORVAL)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OTTAWA</td>
<td>0.014</td>
<td>1420</td>
<td>355</td>
<td>-16</td>
</tr>
<tr>
<td>HALIFAX</td>
<td>0.012</td>
<td>686</td>
<td>172</td>
<td>-15</td>
</tr>
</tbody>
</table>

**SOURCE:** Aviation Statistics Centre, Transport Canada, Aircraft and Passenger Movement Statistics, various years.
previous four-year averages. In two cases (Pearson and Dorval) the airports are experiencing net losses in passenger traffic. Net losses occurred in aircraft movements at several eastern airports but with even larger negative growth rates than with passenger traffic.

Montreal's Dorval airport was the only eastern airport suffering from both a drop in passenger and aircraft movements. This is a result of government policy requiring international airlines to use Mirabel to serve the Montreal region and therefore all international traffic at Dorval has now been transferred to Mirabel (except transborder flights to the U.S.).

In comparison with American eastern airports (Table III Section 3.4.1), Canadian eastern airports experienced much smaller growth rates or negative growth rates in 1981-84. This trend is evident in both passenger and aircraft movements.

The growth in passenger traffic at Canadian airports between 1964 and 1980 can be attributed to three main elements; the introduction of inexpensive airfares, increased popularity in long distance tourism, and a young population able to travel in the post war prosperity.

Between 1964-1980 Canadian western airports experienced even larger percentage increase in passenger and aircraft movements than the eastern airports (Table II, Appendix 1 Graphs 3 & 7). Most of the major
## TABLE II

**CANADIAN WESTERN AIRPORTS**

**PASSENGER & AIRCRAFT MOVEMENTS**

<table>
<thead>
<tr>
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<th></th>
<th></th>
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<tbody>
<tr>
<td>VANCOUVER</td>
<td>0.962</td>
<td>705</td>
<td>176</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>WINNIPEG</td>
<td>0.591</td>
<td>406</td>
<td>102</td>
<td>-14</td>
<td></td>
</tr>
<tr>
<td>CALGARY</td>
<td>0.465</td>
<td>866</td>
<td>217</td>
<td>-10</td>
<td></td>
</tr>
<tr>
<td>EDMONTON</td>
<td>0.300</td>
<td>780</td>
<td>195</td>
<td>-21</td>
<td></td>
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</table>

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<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>VANCOUVER</td>
<td>0.024</td>
<td>1136</td>
<td>-17</td>
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<tr>
<td>WINNIPEG</td>
<td>0.017</td>
<td>712</td>
<td>10</td>
</tr>
<tr>
<td>CALGARY</td>
<td>0.014</td>
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<td>-16</td>
</tr>
<tr>
<td>EDMONTON</td>
<td>0.010</td>
<td>958</td>
<td>-21</td>
</tr>
</tbody>
</table>

**SOURCE:** Aviation Statistics Centre, Transport Canada, Aircraft and Passenger Movement Statistics, various years (see Graphs in Appendix 1).
growth in passenger movements in the 1964-80 period can also be attributed to inexpensive fares which replaced rail travel, a large youth population able to travel and the increased business traffic related to the oil and other primary industries situated in the West.

The negative 4-year average growth rates for both passenger and aircraft movements at all western airports (Table II) reflect the economic downturn in the primary industries during 1981-84 (especially the oil industry). In comparison with American western airports (Table IV Section 3.4.1) Canadian western airports have all experienced double digit losses in their 4-year average growth rates while the American airports have all experienced double digit gains in both passenger and aircraft movements.

Even though the growth rates are not as strong in the most recent time period (1981-84), some of the present airport structures were not large enough to accommodate the expansion of the earlier years. This "breathing period" has given the AAG an opportunity to catch up and to assess what to do next with respect to funding and managing the present airport system.

Airport congestion will become more severe at certain airports if deregulation and the hub-&-spoke system are fully implemented before the AAG can restructure its management methods to be more efficient in responding to the demands of the airline industry.

2.4.2 Mega-Carriers and Canadian Airports.
The easing of government regulation on transportation in Canada has lead to an increase in merger activity leading to the creation of "mega-carriers" similar to practices in the United States (Section 3.4.2). The mega-carrier is the result of the merger of several airlines into a single company, which either operates as a single airline (ie. the purchase of the Canadian Pacific group by PWA to operated as Canadian Airlines International) or uses the separate logos and is controlled by a parent company (ie. Air Canada's purchase of Air Ontario and Air BC).

The creation of mega-carriers in the 1980s has lead to one or two airlines dominating the major Canadian airports for terminal facilities. These major carriers must be brought into airport management to make informed decisions with respect to airport development. Under the present AAG structure airlines are not part of the formal process. This means airport management is making investment decisions for airport expansions to accommodate these carriers not knowing how these airlines plan to utilize the airport in the future.

The development of mega-carriers in some cities has created virtual control of gate space at several U.S. airports by one or two airlines (ie. United & American Airlines in Chicago, Delta & Eastern in Atlanta, Texas Air in Newark and TWA at St. Louis) and will do the same in Canada (ie. Canadian Airlines International in Vancouver and Air Canada in Toronto). If this does happen, it would be difficult, if not
impossible, for new airlines to enter service into that city. This would be circumventing the government's policies of, increasing competition by removing regulation and, increasing utilization of our airports by trying to market these facilities to more airlines.

2.4.3 Impact of Hub-&-Spoke Operation on Airports.

The creation of the hub-&-spoke system for airline operations, as a result of deregulation in the United States, has had an immense effect on airports. The airlines created the hub-&-spoke system to increase the utility and yield factors of their equipment. Diagram 1 in Appendix 1 compares how this system works in comparison to the traditional point-to-point nonstop system of airline operations used prior to 1978.

Using this method of operation the capacity of existing air traffic control, gate space, baggage handling and commercial services (ie. gift shops, restaurants, car rental, etc.) have all been put under serious strain. Since 1984 under relaxed regulation and soon to be

43 Cybulski H. "PWA has that hungry look; Air Canada, CP or Wardair could be a takeover target", Western Report. Sept. 22 86 p. 13. and, Gallagher Tim. "One more shot in the air war; CP buys into Norcanair as two big airline 'families' emerge", Western Report. Oct. 20 86 p. 16. and, Globe & Mail. Gibbens Robert. "CP Air plans takeover of Nordair in bid to compete with Air Canada". Oct. 09 85 Bl. and, Globe & Mail. Doug Jansen. "CP Air gearing up to challenge Air Canada's domination". Dec. 02 85 Bl7. and, Globe & Mail Cecil Foster. "Nordair gets ready for new role as feeder line to CP Air". Dec. 05 85. and Globe & Mail Mathew Horsman. "Quebecair sale to Nordair Metro leaves Air Canada out in the cold". Aug. 09 86.

implemented deregulation of airlines, Canadian airlines have also been working towards establishing hub-&-spoke operations. Vancouver International Airport in western Canada and Toronto International Airport in central Canada are rapidly developing as the major hubs in Canada.

Toronto and Vancouver airports are rapidly reaching major congestion levels as airlines try to add more flights and services (ie. feeder routes). The airports are also falling behind in accommodating the boom of commuter airlines (ie. Air BC, Air Atlantic, City Express, Air Ontario, Time Air, MetroNordair, and Inter City Air). All of these carriers operate small turboprop equipment (Dash 7's or 8's, twin otters, DC-3, etc.) which airports do not have sufficient docking or gate space facilities to accommodate them.

Both, CATA in Canada and the FAA in the U.S. have documented that the hub-&-spoke system has resulted in a congestion producing method of operations for airports and also sparked a growing incidents of near mid-air and on-ground collisions at major hub airports. There is a growing runway congestion problem as well. This has occurred because of


the problem with safely mixing the jet aircraft of the main airline carriers and the turboprop aircraft of the growing commuter airlines. An additional problem adding to the congestion of the major airports is the overcapacity of services offered on several routes between major city pairs.
2.5 Canadian Airport Financing.

2.5.0 Traditional Financial Sources.

Perhaps the critical problem with the AAG system of management is its method of financing airport development. No funding is permitted by the private sector. Airports compete against each other for the limited funds available from the federal government for expansion. In 1986, with a government focussed on reducing their debts it becomes more difficult to convince them to spend the funds on airport development.

The complexity of the process is increased by the fact that the airport system is tied directly to the political process of the Federal budgetary and financial planning process. A funding decision at a Canadian airport must go through two procedures; first, the Approval-in-Principle process and second, the Project Approval Process. Within each stage there are several steps to be followed and persons to be notified.

2.5.1 Approval Process (1986): Step One - Approval in Principle.

As outlined by the Ministry of Transport;

The Approval-in-Principle process is the formal presentation of proposals to the appropriate level of management to seek the authority to proceed with the detailed analysis required to develop a specific solution to a problem or opportunity.47

The document for this process is referred to as a Approval-in-Principle Document (APD) (see Appendix 3). The APD is expected to be short and

concise with respect to explaining, in broad terms, what the proposal is about. Appendix 1 Figure 3 illustrates the APD process and will be used as a guide in explaining how the process operates.

The APD can only present a single resource allocation proposal at a time (some exceptions ie. similar equipment for multi-sites can use an OMNIBUS APD). The first step is to identify a problem, opportunity, or idea that is appropriate for the originators department to implement. Second, the question of the need for an APD is addressed. The major factor, for deciding if the APD is required, is the monetary value of the project.

If the project is under $250,000 the APD is optional but is encouraged to provide the administration with a clear and concise report on what the money is being used for. If the project is between $250,000 and $3 million step three of the process is the preparation of the APD itself. The fourth step is Administrative approval at the Regional Office level, if the project is under $3 million, and finally step five is the APD being placed in the Capital Program and the MultiYear Operations Plan (MYOP).

If the project is over $3 million, then at step four the APD requires the additional approval of the Deputy Ministers (DM) because the amount required is larger than the approved levels of funds for the regional administration to decide upon. This acts as a check on regional administration's spending of public funds.

The second stage of approval for funds, is the Project Approval process. A Project Approval Document (PAD) is required to; "present to the appropriate level of management, either departmental or Treasury Board depending on the cost of the project, detailed project proposals in order to obtain project approval."\(^{48}\) The project approval process is divided into the Preliminary and Effective Project Approval processes.\(^{49}\) Appendix 1 Figure 4 illustrates the processes for both Preliminary and Effective Project approval.

The Preliminary Project Approval process is required for projects which class A or B estimates cannot be developed without expending capital resources. However, some activities can be done prior to seeking preliminary project approval:

i) option analyses,
ii) feasibility studies,
iii) socio-economic studies,
iv) market analyses,
v) topographic surveys,
vi) pricing & availability studies.\(^{50}\)

The Preliminary PAD represents the spending authority to proceed with the development of class A or B estimates for the entire project by entering into contracts subject to the allocation and availability of funds. Richard French's book, How Ottawa Decides, Planning and


\(^{49}\) ibid., p. 3.

\(^{50}\) ibid, p. 5.
Industrial Policy-Making 1968-1980, provides a good summary of what Class A and B estimates are. The "A" estimates covers forecasts of expenditure to maintain current levels of service in programs which have already been approved and a part of the current expenditure budget. The "B" estimates cover forecasts of expenditures for new programs and/or expansion or improvements of existing programs.51

The Effective PAD represents a detailed resource allocation proposal for a total project based on Class A or B estimates which were developed in the Preliminary PAD procedure. The approval of the Effective PAD represents the spending authority to implement the project subject to the allocation and availability of funds. This last point is important with respect to identifying when the decision for investing is made, and who makes that decision.

The timing of both PAD and TBS (Treasury Board Submissions) documents should be submitted for final approval to the appropriate management level throughout the year. However, for inclusion of the proposal in either the Spring or Fall Update to the MYOP, as part of the larger federal budgetary/financial planning process, also referred to as the Expenditure Budget Process, they may have to be submitted for departmental approval (Regional Office) up to a year and a half before the beginning of the fiscal year that the project would be implemented.52


52 ibid, p. 16.
2.5.3 Airport Financial Management: Bottlenecks.

In an analysis of the funding decision-making processes at Canadian airports, it can be stated that it is a complex and a highly centralized task. If an APD project requires funds between $250,000-$3 million, the implementation of the APD is contained within the federal bureaucracy of the regional administrative offices. Over $3 million and the project requires the DM's approval before the administrative body can continue researching the proposal any further.

The second stage of approval for acquiring funds, the PAD, is similar to the APD in that projects up to $3 million can be approved by the regional offices. However, above $3 million a TBS must be prepared and approvals must be received from the Minister and Treasury Board. Therefore, there is a clear division of control, accountability, and responsibility for how the PAD's are approved.

The $3 million level clearly delineates the point between being a regional administrative decision and a decision that becomes more centralized and political in nature. The expenditure of large sums of public funds is out of the realm of bureaucratic decisions and into a political decision-making process. Therefore, if the Ministry of Transport cannot fund this project within its existing budget then it is up to the Minister, with the appropriate APD's and PAD's provided by his Ministry, to present this problem or opportunity to Cabinet through the Treasury Board in an attempt to have the Department's budget increased.
Since all Ministers are in this same position, of trying to obtain a large part of the Federal budget, it can be a long process, expending a great deal of time and resources of the Ministry, but may not always prove successful. This is usually only a problem at the PAD level of the process, since this is when the government must commit funds for the actual implementation of a project.

This present method of requiring Treasury Board approval for PAD's is effectively passing the decision-making ability of airport management to a slower and more involved political process which has funding demands coming from many other departments simultaneously. Once the decision passes up to the level of Cabinet ministers on the Treasury Board, it is difficult to determine the exact process for the funding decision because, Cabinet documents and discussions are confidential and therefore, not readily available for analysis.

Although the documentation (APDs & PADs) may prove airport funding is required now, if the government has placed its' emphasis in some other sector that requires utilization of its' budget through a Ministry other than the Ministry of Transport than the investment opportunity is lost and the problem remains unresolved or grows more critical for the airport.

In conjunction with this highly centralized control of funding decisions it should be emphasized that the airports have no options. They can only get funds through the Federal budget. Therefore, effective
control of implementing any large project is centralized in Ottawa in a political process leaving local airport management unable to plan its future with financial certainty.

2.6 Effects of Political Suasion on Airport Management in Canada.

2.6.0 Political Suasion and the Ministerial Structure.
This section analyzes to what extent ministerial airport management decisions are influenced by political suasion. The attributes of suasion are described by Stanbury and Fulton in their work titled "Suasion as a Governing Instrument" in Allan Maslove book, How Ottawa Spends Money 1984: The New Agenda. The study of suasion as a governing instrument on the private sector or even within the public sector is relatively new. The more traditional instruments of governing, such as taxation, regulation and crown corporations have been more thoroughly documented. The analysis of suasion is not an exacting science at this time but the attributes or elements that suggest suasion to be operating, as described by Stanbury and Fulton, serve as useful indicators at this time.

In the ministerial structure of CATA or AAG, the majority of authority resided with the politicians and headquarters branch of the bureaucracy (see Flowchart 1). Some authority is delegated downward, but the Regional Administrator's main function is to pass decisions from headquarters to the local airport administrations. The local airport manager carries out the headquarters branch directives and has little discretionary authority to alter the policy decisions at headquarters or
at the regional level.

2.6.1 Intention of Ministerial Airport Decisions.
The identification of the intention of the ministry as a governing instrument is moderate to high. The Ministry of Transport is able to direct government spending on airports and confer benefits selectively because of its monopoly in ownership of major airports and their administration. The identification of costs are not as concise. Costs of airports are borne by the general public because the ministry's appropriations come out of; the general revenue from the Air Transportation Ticket Tax, and the airline's landing fees. The outcome of this method of identifying the intention of decisions is narrow benefits with diffuse costs.

2.6.2 Implementation of Ministerial Decisions.
As a ministry, implementation of policy initiatives can be quite slow. Because of the ministry's three-tier management structure, both the public and the airlines had complained that it is unresponsive to their needs. There was no consultative body within CATA which local
residents or local governments could access the policy-making process. Any policy change must come from the ministerial level down through the bureaucratic structure. The limited authority of the local airport administration makes it difficult for the airports to tailor any decisions to response to local issues and needs. In addition to this management structure, airlines have different goals to that of the ministry. Airlines are profit and cost efficiency oriented, the ministry is concerned with providing equitable services. This conflict often results in major delays in timing between airlines demands and the ministry deciding through the management system equitable solutions.

2.6.3 Flexibility of Ministerial Decisions.

The flexibility of ministry actions for both costs and benefits is low. To significantly alter the scale of the ministry's actions, it requires a change in its annual appropriation. To achieve an increase in appropriations, the minister will have to compete with other ministers in Cabinet for funds. Similarly, a reduction in spending programs to reduce the federal deficit will have political ramifications which require careful considerations by the Cabinet. The net effect is that changes are slow to develop.

Once a decision has been made by the ministry, the probability of its reversibility is low. The complexity and size of the bureaucracy, changes or modifications are slow to develop and to be implemented. The full effect of a ministry decision may not be immediately known and by the time it is known, the slow moving structure of the ministry may impede the public or the airlines from effectively reversing the action
for some time. The effect will be that the public, or airlines, will continue to bear the extra costs of ineffective decisions by the ministry.

2.6.4 The Hidden Agenda of Ministerial Decisions.

The hidden agenda syndrome or "fog factor" refers to the ability of the ministry to disguise its true objectives and avoid criticism for otherwise "questionable" acts, is low. The actions of the Ministry of Transport are very visible because it must obtain its authority for expenditures through public Estimates. Consequently, the Transport Minister, the politician responsible for the department, is very exposed politically. The general public will be concerned with costs while the politician's constituents will be concerned with direct benefits (airport improvements) or the lack of benefits which they feel entitled to.

In light of potential public criticism over airport costs, the ministry is the governing instrument most susceptible to direct political control. The Minister is part of Cabinet and thus the executive of government. The political control of the minister in some cases may be dependent on the cooperation of the bureaucracy. When the minister threatens the authority or domain of the bureaucracy, the bureaucrats may act to thwart the effective control of the minister. The bureaucrats may have their own "constituents" who lobby the minister and thereby justify the existence of the bureaucracy in its present form.
2.6.5 Symbolic Ministerial Decisions.

Symbolic acts of the Ministry are hard to make because of the need for appropriations and the resulting increased tax burden on the general public. Actions taken at airports tend to be tangible, measurable by the public and the airlines, and symbolic acts would be seen as such since no benefit would be detected. For example the announcement by Transport Minister John Crosbie on December 5 1986 that Mirabel and Dorval serving Montreal will be merged and operate as "Montreal International Airport - Terminals North and West"53 was basically condemned as a non-decision by the Opposition and aviation industry critics.

This decision has been interpreted as a symbolic move to keep federal politicians popular in both Dorval and Mirabel ridings and to justify past federal Transport Ministers decisions to build Mirabel. In Montreal, local politicians (including Jean Dore - Mayor of Montreal), the Montreal Board of Trade, the Chambre de Commerce de Montreal, Greater Montreal Convention and Tourism Bureau and the Montreal Urban Community support the closing of Mirabel and the build up of Dorval.

The danger in the decision to continue building at Dorval is, it is hemmed in by residential and other urban developments which curtail development possibilities without creating a great number of noise and safety concerns for residents of Dorval. But the statement has a great

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deal of symbolic content for the local politicians since they are interpreted as saving and/or creating jobs in the city of Montreal as oppose to the Mirabel region.

2.6.6 Ideological Content of Ministerial Decisions.
The ideological content of ministry actions can be very high. If the government believes that every person in Canada is entitled to safe and adequate air transportation, regardless of whether the person's particular locale can support an airport profitably, any action that the ministry takes toward establishing such an airport will have a very high ideological content. This was particularly important in the early development of aviation in Canada as outlined in Sections 2.1 and 2.2.

2.6.7 Financial Accountability of Ministerial Decisions.
The degree of financial accountability of a ministry is, theoretically, high. The ministry's expenditures/appropriations must be submitted to annual public Estimates. Its actions may be investigated by a legislative committee, and its accounting books audited by the Auditor General. This high accountability is only in a formal sense, in a practical sense, the accountability of individual airports is very low.

Auditor-General K. Dye reported in October 1985 that the method of accounting for individual airports was difficult to trace. Mr. Dye described CATA as an organization that was suppose to recover operating costs, but it didn't know what its real costs were. The accounts of individual airports are lumped together under Transport in the Annual

The effect is that costs are spread over the entire airport system.

2.6.8 Social Costs of Ministerial Decisions.

The social costs of political suasion to implement the policies of the ministry are very large. The Ministry of Transport endorsed the policy of providing airports whether they are profitable or not. Increased expenditures by the Ministry of Transport meant increased costs to the general public, the travelling public, and the airlines. The social costs of past CATA decisions were very large therefore, in 1969 the Ministry of Transport established the Airports Revolving Fund for the purpose of making the larger airports within the Fund financially self-sufficient. The number of airports in this Fund was reduced from twenty-three to nine in 1985 to try and make these top nine airports more self-sufficient. According to a recent business analysis, with the exception of Mirabel, Halifax, and Calgary, the remaining revolving fund airports are self-sufficient.

The enormous social costs of airport administration is arguably the result of using a ministry as the management instrument. The efficacy of a ministry to achieve the substantive objective is low. Traditionally, a ministry is not profit motivated or cost conscious. The first objective of a ministry is to provide a service in an


56 Carleton University School of Business, Ottawa International Airport Management Project, Final Report, Ottawa, Carleton University, 1985, p.11.
equitable manner to the entire population because of a policy decision by the political system. One of the objectives of this thesis is to show that an alternative management instrument may be better with respect to the operation of Canadian airports.

A major criticism of the ministerial management method is the influence political suasion has on its bureaucratic structure. If the influence of political suasion on the structure were removed or reduced and the airport administration more responsive to local needs, the Ministry of Transport would be more efficient, in social costs, in reaching its objectives.

2.7 **Canadian Airport Development: Community & Management Goals.**

2.7.0 Airport Development & Community Input.

A lack of meaningful local participation is a strong criticism of the present system of airport management in Canada. This problem has its roots in the division of powers in Canada under section 91 and 92 of the **British North America Act**. Provinces under section 92 have jurisdiction to regulate the use of land. This power in turn has been delegated by provincial legislatures to municipalities for administration. However, airports and aviation remain under federal jurisdiction through section 91 of the **BNA Act**. There has been little evidence of cooperation in the past fifty years between levels of government concerning land-use

development surrounding the airports or on airport property itself.\textsuperscript{58}

As shown in Appendix 1 Table 1 the physical size of the airports, in relation to each city's size, is substantial. Airports are large properties operated outside of local planning jurisdiction and in many cases their spatial influence on residential, commercial, industrial and recreational planning strategies are critical. It is argued that a change in management methods would assist in facilitating greater cooperation in land-use planning surrounding airports. The following example at Vancouver airport is a typical problem that occurred with airport development in Canada under the CATA method of management.

Provincial & municipal officials are responsible for managing the impact of aviation facilities on surface transport and housing in the area but they rarely exercise a substantial role in formulating and implementing programs for airport development. In 1973, after an intense local protest in Vancouver by the regional government (GVRD) and local citizens groups, an institutional framework emerged to incorporate metropolitan participation. This institution was the Airport Planning Committee (APC). Unfortunately, even with the APC in place, their decisions were not necessarily used if the headquarter's decision in Ottawa or in the regional office were different. The APC gave the municipalities a token opportunity to express their concerns but did not guarantee that the airports development plan would be altered.

Between 1920 and 1975 the two main solutions put forward by the Ministry

\textsuperscript{58} Ibid, p. 363.
of Transport, and other airport authorities, for solving airport problems were; to build entirely new "environmental" airports or to expand the existing airports infrastructure (ie. runways, terminals, cargo facilities). Section 2.7.1 and 2.7.2 analyze these two solutions in more detail.

2.7.1 Solution One: The Environmental Airport.

The first solution of building an environmental airport required that enough land be expropriated in an area removed from populated regions. This would guarantee future airport development without interference by conflicting land-users. In the 1970s this option was the policy strategy for the creation of Mirabel, 34 miles from Montreal, and the expropriation of property in Pickering, 30 miles northeast of Toronto. While this solution solved the problems of disturbing nearby residences or other land-users it created massive infrastructure costs for the provinces and federal government to develop highways and services (ie. water, sewage, electricity) to the new airport site.

Under the Expropriation Act 1969, in effect when land was expropriated for Mirabel, the Crown assumed legal ownership of the land as soon as the proper papers were submitted in the local land registry office. The land was then in federal ownership and its tenants became territory tenants of the government. The properties were no longer in the tenants legal possession and they had to wait for the government to make good on


its promise of compensation. In fact, the first firm offers did not appear before June 1970, with some residents not receiving a written offer for more than 3 years after the Expropriation.61 This delay in compensation for expropriation left thousands of families financial insecure and unable to start new lives elsewhere if they chose to leave.

The operational zone at Mirabel occupies 5,000 acres with a potential further 12,000 acres for airport development. In addition to these 17,000 acres, the federal government owns a Noise Buffer Zone of 79,000 acres surrounding the operational zone (Appendix 1 Map 2).62 To appreciate this scale, the city of Montreal only occupies 43,000 acres of the Island of Montreal. Eventually the federal government had to form a management agency for the property. In December 1974, the Department of Public Works (DPW) became the land manager while the Ministry of State for Urban Affairs (MSUA) was the planning agency.63 MSUA also chaired the interdepartmental policy committee overseeing land use. After the financial negotiations were completed (the Ministry of Transport being compensated by DPW) the land was transferred to DPW in April 1979.

The federal government had fragmented the management decision-making process by using the Ministry of Transport to operate the operational airport zone (17,000 acres), MSUA to do long range planning for the

61 ibid, pg. 62.


63 ibid, p. 75.
79,000 acre buffer zone and DPW to be the land manager of the entire property. In May 1982, 29,400 acres were disposed of in an effort to reduce DPW's debt load for this property.

Discussions for a second international airport for metropolitan Toronto began in December 1968. In September 1975 the plans for it were abandoned and the construction of Terminal 2 at Pearson was approved.\(^6^4\) The airport had been a political football between the federal and provincial governments for the entire period. Politicians argued for the airport on the grounds of; regional economic development (Ontario government's position), keeping the Malton community groups content with respect to no noise increase at Malton (Pearson International), and Ontario's share of federal development money with respect to the development occurring at Mirabel. None of the arguments were utilizing technical or demand data forecasting, nor did any of these arguments include the municipal administrations input. This is a clear case of symbolic and ideological actions by the federal government winning out over the technical and statistical information.

In Toronto's case the federal government's plan called for the expropriation of 18,000 acres of land for an operational zone.\(^6^5\) The federal government did not intend to purchase the "noise land" as they had at Mirabel. A complex intergovernmental negotiations between Ottawa and Queen's Park had the province agree to purchasing some "noise

\(^{64}\) ibid, p. 79.

lands" for a proposed "airport city" and zoning the remaining property in the area in conformity with federal plans (Appendix 1 Map 3).66

This decision was only agreed upon after the Ontario government refused the Federal government's request to freeze temporarily several sites totalling over 250,000 acres until a final choice was made. As shown in Appendix 1 Map 3 and Table 1 to hold 250,000 acres in government possession would have been an area exceeding the entire metropolitan Toronto region by 100,000 acres. Even so, the 18,000 acres held by the federal government and the proposed "airport city" lands of the provincial government would have equalled an area approximately one quarter the size of metro Toronto if completed.

The expropriation of land for Pickering was met by a great deal of opposition by local residents, the Ontario government, and the airlines. Local residents, headed by the citizens group POP (People or Planes), were concerned about several aspects of the new airport; noise, the expropriation process, and the need for the airport to be located in Pickering.

The Ontario government was concerned with who would pay for the infrastructure costs of highways, sewage, electricity, water, etc., to the remote site. These land use developments are within provincial jurisdiction and normally administered by the local municipality or Council. Pickering, being a rural municipality, did not have the tax base to fund such development. The federal government was lobbying the

66 ibid, p. 89.
provincial government to provide the funds necessary to put in the required infrastructure on a shared basis.

In addition to this activity between levels of government, the airlines where not convinced that Malton (Toronto International) could not be modified to meet their needs. They would have to double their ground staff and equipment (ie. check-in, baggage, fuelling, etc.) if Pickering and Malton were both operative. An expensive lesson had been learned by all airlines in the early 1980s operating in cities with dual airports (ie. Dorval-Mirabel Montreal, Dulles-National Washington D.C., JFK-LaGuardia New York, Edmonton International & Municipal Edmonton) and none cared to have it happen again in Toronto.

2.7.2 Solution Two: Expansion of Airports.
The second solution, airport expansion, maximized the land already in airport & aviation use. This increased concerns of nearby residences with respect to noise, safety and surface traffic congestion but did not separate the airport activity from other land use activities as did Solution One. The following example of the Ministry of Transport's proposal to expand Vancouver International Airport with a third runway is typical of problems relating to this second solution of solving airport congestion.

In 1954, the federal government consolidated their holdings of 1,102 acres on Sea Island. In 1962 they paid the City of Vancouver $2.75
million for an additional 450 acres which included the airport itself.\footnote{67} By 1967 the federal government owned more than 2,000 acres on the island. In 1972 the federal government engaged in expropriating the remaining property on Sea Island, namely the community of Burkeville, for road access improvements.

The expropriations were to be carried out under the new \textit{Expropriation Act 1970} which required a public hearing. At this hearing SIRA (Sea Island Ratepayers Association) and the GVRD Planning Department testified that further study was required before airport expansion was carried out. The GVRD planners pointed out that some of the runway congestion problem could be alleviated by reducing the number of non-commercial flights at Vancouver International (in 1971 they accounted for 58\% of the flights) and thereby delaying the need for a third runway.

After intense public opposition to these massive public works projects, by either building new airports or large expansions of existing facilities, plus the amendment to the \textit{Expropriation Act} requiring public hearings, Transport Canada decided that a third option must be explored, the "no-build" solution. Section 2.7.3 presents the third solution which is gaining in popularity in the 1980s.

2.7.3 Solution Three: The "no-build" Option.

This solution required new ways to solve the airport saturation problems

of over-crowded terminals and runways at peak periods. Canada has been slow to act on this option but in the U.S. and the U.K. airport authorities have altered their methods of management to incorporate this third solution. Both have altered their landing fee schedules to discourage general aviation traffic at major airports and developed pricing mechanisms to penalize peak users.68

This did help alleviate airside congestion for a brief period (at major U.S. metropolitan airports) but, the number of passengers utilizing existing air facilities has continued to increase through the use of wide-bodied jets, and increased load factors on scheduled flights primarily from the hubbing system being adopted by most airlines (Section 2.4). As a result, urban authorities must still provide access to the airport for more people, and neighboring communities suffer from increased surface traffic.

The next section provides a summary of lessons learned from the Canadian experiences through the evidence presented in Sections 2.1 to 2.7 of this thesis and their effects on airport management in Canada.

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2.8 Conclusions: Lessons Learned from Canadian Experiences.

2.8.1 Canadian Early Aviation History 1900-1960. 
There are three main lessons to be learned from Section 2.1 on Canada's early aviation history. First, the government did not create legislation which clearly and concisely dealt with the operation and management of airports. Airports appeared as secondary items on air navigation legislation or as make-work projects during slow economic cycles. Second, the federal government's purchase of major airports in the 1950s and 1960s, to meet ICAO commitments, initiated the spending cycle for maintaining international standards at many Canadian airports. Third, the airport expenditure cycle is paralleled by the infrastructure expenditures required by suburban areas of the major Canadian cities. This situation means none of the municipalities will ever willingly resume responsibility of managing the major airports unless funding is established from a source other than municipal taxes.

2.8.2 Government Aviation Policy 1960-1986
Section 2.2 outlines four major developments in government aviation and airport policy. First, the federal government's attempt at separating airport noise and other environmental problems from populated areas, by building environmental airports, was physically successful but created large operational and financial problems for the Ministry of Transport. The expropriated properties was mishandled by an untrained and understaffed civil service.
Second, there has been almost universal inadequacy in Canada with coordinating federal government aviation development with provincial land use policies. The only exception has been the Airports Vicinity Protection Area (AVPA) Act as part of the Alberta Planning Act. The AVPA allows municipal planners to coordinate land use activities with airport development.

Third, the Ministry of Transport has shifted its policy emphasis from supplying airports as a service to making that service economically efficient and more self-reliant. This policy shift has not been accompanied with policies to significantly change the management structure of the Ministry. Without such policy the Ministry of Transport, like any government department, is still geared for supplying a service.

Fourth, the liberalization of airline regulations and the creation of airline hub-and-spoke operations have both exacerbated the demands for airport access at a time when the ministry has yet to adequately accommodate the growth of the 1970s.

2.8.3 Canadian Airport Management Structure.

As outlined in Section 2.3 the AAG in its present form varies only slightly from the seventeen year old CATA structure it replaced. It will be just as ineffective as CATA was with managing airports in the late twentieth century because of its highly centralized bureaucratic structure.

2.8.4 Canadian Aviation Growth & Technological Change.
Section 2.4 outlines the interactions of technological change, passenger growth trends, airline size, the method of airline operations, and their effects on the operation of Canadian airports. All these factors must be correctly analyzed by airport management to anticipate future demands on the airport. At present, many of the major airports in Canada are not adequately equipped to manage the newest of jet and commuter aircraft, resulting in gate, runway, and airway congestion. The rapid growth in passenger traffic between 1960 and 1979 was never fully accommodated. In addition to this, the daily peaking of passenger movements, because of hub-&-spoke operations, have continued to emphasize present airport management's inability to design and plan the necessary facilities for aviation in Canada.

2.8.5 Canadian Airport Financing.
As stated in Section 2.5, the method of financing Canadian airports is one of the critical problems with airport management. The present structure allows no private funds for airport development. The process of obtaining funds is highly centralized and political in nature.

The Minister of Transport must balance project requests from all divisions of the Ministry and, in turn, Treasury Board must balance project requests from all Ministries. In this process airport development plans, which are dependent on economic and social conditions, are caught up in political developments which have nothing to do with air transportation.

2.8.6 Canadian Airports: Political Suasions Impact.
In Section 2.6 this thesis examined political suasion with regards to different attributes and their impact on airport management decisions in Canada. It was concluded that the ministerial management method is far too often influenced by several attributes of political suasion. If the influence of political suasion on the bureaucratic structure of the Ministry of Transport were removed or reduced, and the airport administration made more responsive to local needs, it would be more effective in managing airports.

2.8.7 Canadian Airports: Balancing Community & Management Goals.
Section 2.7 revealed several reasons for the failure of past attempts by the Ministry of Transport to balance airport and community goals. The construction of new airports, which were far removed from other urban activities and residential neighbourhoods, was unsuccessful because of the lack of provincial cooperation (ie. road, water, sewage developments) and manpower to administer the expropriated property. The development of new airports also incurs large expenditures for all Canadian taxpayers.

The second solution of expansion of existing airports was unsuccessful under the AAG because of the lack of consultation with local municipalities on issues of noise pollution, traffic congestion and safety.

The third attempt at creating a balance between airport development and community goals has yet to be adopted in Canada. The solution of adjusting the existing facilities to maximize their use (ie. peak period
pricing, new lease agreements) would satisfy some community goals (ie. road congestion, reducing public funds needed for airport expansion) in the short term. In the long run this solution does not change the structure of management therefore when AAG decides that the maximum use of the existing structure has been reached, it can initiate the expansion without being bound by the concerns of local municipalities or interest groups.
3.1 American Aviation Early History 1900-1960.

3.1.0 United States 1900 - 1930: Early Beginnings.

American aviation began in Kitty Hawk North Carolina with the Wright Brothers in 1903.\(^1\) The early American pioneers of aviation had similar limited sources for revenue as aviators in Canada: surveying, crop dusting, and barnstorming. Herbert Hoover proposed that:

> by fostering the development of civil aviation, the government would be producing a large body of skilled pilots, mechanics and aeronautical engineers, as well as a vigorous air force and engine manufacturing industry ...\(^2\)

To help provide the commercial incentive for the advancement of civil aviation the Airmail Act 1925 (the Kelly Act) authorized the Post Office Department to contract with air carriers to carry domestic mail.\(^3\)

During 1926 Congress debated how the future air commerce industry should be managed. Congress concluded that the government would be responsible for initiating airways, lighting and navigational aids, emergency vehicles and weather reports, and similar to seaport facilities, municipal authorities should control and operate the airports.\(^4\) These initiatives and divisions of responsibility were enacted in the Air

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\(^1\) Wiley John R., Airport Administration, Eno Foundation for Transportation, Inc., Westport Conn., 1981, pg. 3.


\(^3\) Ibid, p. 234.

\(^4\) Ibid, p. 235.
3.1.1 United States 1930 - 1939: The Depression Years.

During the Depression, the American government's commitment to construct and maintain the airways was accomplished by the Bureau of Lighthouses of the Department of Commerce. By mid-1933, sixty-eight radio communications stations serving the federal airway system had been placed at intervals of 200 miles. During the 1930s the development of airports was not as systematic. Airport development was dependent on municipalities (as enacted in the Air Commerce Act 1926) and therefore was slow in developing since most municipalities saw no benefits in creating airports at the time.

The catalyst for airport development occurred in 1934 with the introduction of the DC-3 aircraft. For the first time, there was an aircraft which could make money in passenger service as opposed to hauling mail. It was also the first time that air-carrier rates could be reduced and become competitive with the railroads and bus companies. To accommodate the DC-3, a municipality needed paved runways, measuring 3,500 feet in length. In 1938 only 36 of the existing 1,907 airports had paved runways long enough to handle the DC-3. At this point the United States federal government reassessed their regulations and standards for the aviation industry.

Regulations and licensing of the aviation industry was restructured
under the Civil Aeronautics Act 1938. The Civil Aeronautics Act incorporated three major changes:

1) abolished the Commerce Department's Bureau of Air Commerce and transferred its responsibility to the new, independent Civil Aeronautics Authority (CAA),
2) created the Air Safety Board (in the CAA) as an independent safety board for investigating air accidents, and
3) created the position of Administrator of Aviation.

In 1939, one of the initial tasks of the CAA was an inventory of the nation's airports so that a recommendation could be presented to Congress seeking federal government participation in the construction, development, and maintenance of a national system of airports.

3.1.2 United States 1939-1945: World War II.

In 1940 Congress appropriated $40 million for the construction and development of up to 250 airports that were vital for national defense during World War II. The Second World War greatly accelerated the overall growth of civil aviation by creating tremendous technological advances (ie. DC-4 & DC-6) and demonstrated new uses for aircraft (ie. cargo services). With regards to planning and operations of the aviation industry it was centralized even more, with the CAA emerging from the war with the additional responsibility for air traffic control of all airways.

The intent of the Transportation Act 1940 was to focus on a policy for a national transportation system of all modes. It recommended the coordination of all civil forms of transport in order to guide the large

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federal investments in transportation, under a new national agency. This agency was never created for two major reasons;

1) fear by Congress that too much of the policy making powers would be concentrated in the executive branch, and
2) the agency would be dominated by the very strong railroad constituency.\(^7\)

The Transportation Act 1940 did establish two important air authorities: the Civil Aeronautics Board (CAB), composed of five members vested with legislative and judicial authority and responsible to the president; and the Civil Aeronautics Administration (CAA), which was responsible for safety regulation. This agency was the predecessor of the Federal Aviation Agency (FAA).

The Federal Airport Act 1946 increased the size of the airports program to $500 million over seven years. This was done more for military strategic reasons then concerns for promoting civil operations. At this time concern was expressed by government officials that the development of a healthy aircraft industry and supporting airport system was essential to protect America in an age of aircraft and atomic bomb technology.\(^8\)

3.1.3 United States 1946-1959: Airports & Suburbanization

After the Korean War civilian aviation activities grew quite rapidly as a result of higher incomes, more leisure time and longer vacations for

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7 Ibid, p. 238.

8 Smith Donald J. et al., Airport Planning and Management, Wadsworth Publishing Company, Belmont Ca., 1984, p. 240.
At this time the development of the jet aircraft became the main focus of the American aviation industry (ie. Boeing 707 & Douglas DC-8, Appendix 1 Table 1). The Boeing 707 was introduced to passenger service on October 26 1958, marking a turning point in air passenger growth demands that would revolutionize the airline industry and the demands for airport services. In approximately fifty years the aviation industry had grown from a canvas and twine aircraft for one (the pilot) to moving a planeload of hundreds of people at 600 miles per hour, coast to coast, in under five hours. Aircraft became the prime movers of American travellers over distances of more than 200 miles.

This new generation of jet aircraft, required greatly improved airport facilities; longer runways, better lighting, instrument landing aids, and greater reliability from both radar and air-to-ground communications. In addition to these problems, by 1958, a growing segment of the aviation community was searching for ways that would unite civil and military interests and improve administration of the technical obstacles of air traffic control. The Federal Aviation Act 1958 addressed these problems by giving the following responsibilities to the FAA:

1) control of American airspace,
2) the promotion of American aviation at home and abroad,
3) and the development of a common civil-military system of navigation and air traffic control.\(^\text{10}\)

One of the FAA's most difficult tasks was that of developing a modern airport and airways system to accommodate the new jet technology of the

\(^9\) Ibid, p. 240.

\(^{10}\) Smith Donald J. et al., Airport Planning and Management, Wadsworth Publishing Company, Belmont Ca., 1984, p. 241.
707 and DC-8, and the propeller traffic (DC-6, DC-7, Viscount, Vanguards, Convairs, etc).

American cities in the 1950s also faced large expenditure for infrastructure expansions (ie. freeways, sewage, water systems and public transit). The rapid growth of the suburbs resulted in surrounding major airports with little thought given to problems (ie. noise and safety concerns) that would arise from such actions. The monitoring of American airspace and the promotion of aviation at home were part of the FAA's responsibility, therefore they had to advise the federal administration on how to resolve these growing conflict situations.


3.2.0 Department of Transportation Act 1966.

Between 1963-67, the number of aircraft in operation in the U.S. increased by 33.8%, air traffic control towers handled 54% more take-off and landings, and the number of enplaned passengers nearly doubled. This was also the era of many new jet aircraft entering passenger service (ie. DC-9, DC-8-60, 707-300, BAC-111, VC-10, 727-100, 737-100 see Appendix 1 Table 1).

All of these factors contributed to President Johnson appointing a twelfth Cabinet post, provided by the Department of Transportation Act 1966 and headed by a Secretary of Transportation. The new act reorganized the FAA to be accountable to the Secretary of
In conjunction with the growing needs and complexity of airports, the "airport authority" method of management in the United States was growing in popularity. It worked well on the local level because of its ability to make decisions quickly and its inclusion of the airlines and other airport users in these decisions. Speed and local participation were not enough, funds were required to alleviate the backlog of air carrier demands from the 1960s for; larger waiting lounges, more gate space and improved navigational radar systems. This task would require national assistance.

3.2.1 Airport and Airway Development Act 1970 (AADA).
The Airport and Airway Development Act 1970 (AADA) was a national response to these congestion problems and concerns for safety. All the american airports examined in this thesis experienced substantial passenger & aircraft movement growth in this period (Appendix 2 Graphs 1-8).

3.2.2 Airport and Airway Development Revenue Act 1970.
The Airport and Airway Development Revenue Act 1970 (in conjunction with the AADA) contained several new taxes to aid in the construction and improvements of airports. They were:

i) seven cents per gallon fuel tax for aircraft & non-commercial traffic,
ii) 8% passenger ticket tax,
iii) 5% cargo tax,
iv) $25 annual user fee, all aircraft, and

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v) two cent per lb. Piston and 3.5% per lb. turbine fee (if aircraft over 2500 lb).  

This legislation expired in September 1980 and was replaced with the Airport and Airway Improvement Act 1982 (AAIA). In conjunction with the federal funding of airports and airways (AADRA & AAIA) in the 1970s and 1980s, new legislation to deregulate the airline industry (1978) stimulated airport development requirements.

3.2.3 American Airport Development and Environmental Concerns.
In 1958 President Eisenhower approved a 10,000 acres site in a agricultural area in Virginia's Loudoun & Fairfax counties for the new Dulles International Airport.  

This new airport was to manage the new large jets and increased traffic to the nation's capital that could not be accommodated at Washington National. It was opened in November 1962.

Dulles was the first of what were called "environmental sensitive" airports in North America. This name was derived from the fact that the large tracts of land were used as a buffer zone to reduce conflict between airport activities and other people-oriented land uses (ie., residential neighbourhoods and business communities). This buffer zone was created to protect other peoples environment with respect to noise pollution, safety concerns and traffic growth. This same approach would be used in Dallas five years later to create the Dallas/Ft. Worth

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Regional Airport and in Canada eight years later to create Mirabel.

The airport has two 11,500 ft runways and one 10,000 ft runway enabling it to handle the large commercial aircraft such as the 747, L1011, DC-10, and Concorde. Dulles was not able to draw much traffic away from the conveniently located National airport which lead to under-utilization of Dulles until the 1980s.

In Texas, Dallas/Ft. Worth Regional Airport is one of the few other "environmental airports" built in the 1970s. It only opened to traffic in 1974 but the idea of a single airport for the Dallas/Ft. Worth region goes back to 1927.\textsuperscript{14} Both Dallas and Fort Worth established airfields in the late 1920s with expansions to both in the 1930s. The driving force behind airports at this time was local municipal management which ran counter-productive to cooperation between neighbouring municipalities.

In May 1961, the U.S. Federal government ordered hearings with respect to creating a single airport for the region. By 1965 the Dallas-Ft. Worth Regional Airport Board was organized and planning for a single airport began.\textsuperscript{15} In 1968 an agreement to build the airport was reached by a dual-county authority. The authority method of management because of its flexibility was appropriate and proven successful in this case.

The 18,000 acres site chosen is located half-way between Dallas and Ft.

\textsuperscript{14} ibid, p. 421.

\textsuperscript{15} ibid. p.421.
Worth and is well served by existing highways. Large areas have been planned for aircraft maintenance, industrial air parks, a world trade center and the terminal/hotel complex. When the airport is completed it will extend nine miles from north to south, and about eight miles from east to west. The entire complex to date has cost in excess of $500 million to construct. Traffic trends are noted in Appendix 2 Graphs 3, 4, 7 & 8.

The development of environmental airports in the 1970s was believed to be a straightforward solution to the noise and traffic problems. By simply removing the airport from other urban activities and placing it on it's own large tract of land the problem was solved. Unfortunately, this is not possible in every major urban area, since large areas of property are not available plus, the expense of purchasing the property and the required infrastructure may not be justifiable. Other solutions for balancing airport activities with other urban activities had to be found.

3.2.4 American Domestic Airline Deregulation - 1978.

On October 24 1978, only twenty years after jet service was introduced to American and world markets, President Carter and Congress approved Public Law 95-504 or the Airline Deregulation Act 1978. This act was intended;

to amend the Federal Aviation Act of 1958, to encourage, develop and attain an air transportation system which

16 ibid, p. 421.

relies on competitive market forces to determine the quality, variety, and price of air services and for other purposes.  

(emphasis added by author)

The deregulation act only applied to domestic travel within the United States. Although this act greatly increased flexibility for airline operations, there were some restrictions placed on the American carriers which directly affected airport operations.

First, the Civil Aeronautics Board (CAB) was to encourage air services to move from major urban airports to secondary or satellite airports, where consistent with regional airport plans of local and regional authorities.

Second, the CAB was to ensure, where appropriate, continued and continuous service to small communities and isolated areas by means of Federal subsidy if necessary. This subsidy was designated only for a 10 year period ending in 1988. After this, less expensive carriers will have to be established or service will be eliminated.

Third, entry and exit for the airlines from serving cities was made much more flexible. In both cases, a rush by many airlines for a particular city (e.g. Dallas, Denver, Atlanta as a few examples) or if a city is dropped by several airlines at once, this creates wild fluctuations in the demand for the airports in these cities. This fluctuation results in financial uncertainty for airport management and

18 Ibid p. 250.
reduces management's ability to plan the airports future with certainty.

3.2.5 Airport and Airway Improvement Act 1982 (AAIA).

The Airport and Airway Improvement Act 1982 provided two main elements of federal aid for airport development; a multi-year authorization, and adequate levels of funding.\(^{19}\) The U.S. by 1984 had 15,000 landing facilities but only 300 were served by major air carriers.\(^{20}\) These three hundred facilities handle the majority of the traffic and require large expenditures in navigational and airways facilities, as well as properly equipped reliever airports. The AAIA legislation provided for a $6.32 billion modernization plan for the air traffic control system in the United States which focussed on these major airports.\(^{21}\)

The 1982 legislation also committed $4.8 billion over a five-year plan for airport development shared in the following manner:

* 50.0% to primary (hub) airports,
* 27.0% to general-aviation facilities,
* 12.5% to state governments for airport use
* 10.0% to reliever airports, and
* 5.5% to commuter (small commercial service) airports.\(^{22}\)

This division allocated 60% of the funds ($2.9 billion) to the primary airports and their releivers. The federal government had acknowledged that a well planned and funded system of primary airports and their

\(^{19}\) Ibid, p. 243.

\(^{20}\) Ibid p. 245.

\(^{21}\) Ibid p. 246.

\(^{22}\) Ibid p. 247.
 relievers could reduce hazardous situation (ie. airway congestion) and congestion problems (ie. terminal capacity). The increased commercial use of the reliever airports also improved the overall efficiency of investments in the airport/airway system as a whole.

Although airport management in the United States operates using traditional business principles, its main goal IS NOT to maximize shareholders wealth. Since it is the function of an airport to provide a service, the financial manager at the airport is concerned with a COST RECOVERY STRATEGY rather than a PROFIT-MAKING STRATEGY.23

The American federal government's input focussed mainly on providing extra funds for navigational and safety concerns over the past twenty years (AADA, AADRA and AAIA). Federal policy which attempted to offer management input have lead to expensive facilities, and disrupted services (environmental airports and the Airline Deregulation Act).

Before examining further the impact of U.S. airline deregulation on airport development, a brief outline of the management methods of each airport and of the volumes of traffic would be useful.

3.3 American Airport Management Structures.

3.3.0 Historical Choices.

In this thesis three main airport management systems in the United

States are examined; the municipal department, the municipal commission, and the airport authority. This latter method is not to be confused with the Canadian airport authority system developed in the late 1980s. The American airport authority is the original model and has substantially more individual power and flexibility than its Canadian namesake.

These three management methods have created a wide variation in how airports are managed in the U.S. For example; there are combined seaport-airport authorities such as the New York and New Jersey Port Authority (NYNJPA), city departments with a Division of Aviation such as Denver-Stapleton Airport, city Councils with a Department of Aviation such as Chicago's O'Hare, and Los Angeles International is an example of a city airport commission.

3.3.1 The Municipal Department and The Municipal Commission.

The municipal department and municipal commission approaches have the common root of being responsible and accountable to the elected municipal officials. However there are variations in reporting methods which make them distinct from one another. This section analyzes both methods simultaneously to highlight their major differences and similarities in operation.

Where an airport is managed by a municipality, there are three main forms of administration;

1) authority is delegated to an already existing department of the municipal government,
2) creation of a new department to
   manage the airport, or
3) authority is placed in an independent
   airport commission.

The first two forms are established using the same procedures for any
municipal department. The third type of management, airport
commissions, requires additional procedures to be activated. The Board
of Commissioners are appointed by the elected municipal mayor. The
number of commissioners and the composition of the Board depends on how
the municipality establishes the commission. Commissioners can be
businessman, aviation officials, bureaucrats or elected officials.

Once an airport commission is established, the Board of Commissioners
then selects the airport manager, who is directly responsible to the
commission, not any of the municipal departments.

It was evident as early as the 1940s that any advantages of combining
airport administration with other city departments had tended to
disappear as the complexities of airport operations increased. The
weaknesses of being part of another city department or as an airport
commission were identified as:

i) Authority and responsibility are often divided
   among too many individuals or groups, and
decisions are thus delayed;

ii) the route of authority is often too long and
too circuitous;

iii) airport activities are commonly subordinated to
   the major activities of the department having
   it in their charge; and

iv) despite incidental similarities between airport
    operations and the other activities of certain
    city departments, it will be found in nearly
every case that the essential management requisites are basically different.24

Separate airport departments have been created in many American cities because of the realization that the problems involved and skills required in airport administration are quite different from existing departmental skills. For example, Chicago O`Hare International Airport is owned and operated by the City of Chicago through the Chicago Department of Aviation. Atlanta, Denver and Dallas airports are also city-owned. The chief disadvantage of operating the airport even as a separate department is that in the complexity of managing a larger city's government, the airport department may suffer at the expense of budget and time demands on Council for other issues (ie. Transit, roads, schools).

3.3.2 The American Airport Authority.

The third type of airport management in the U.S. is the "authority" method. This form of airport management is found in the United States as well as many other nations. The management structure for the airport in the multi-purpose authority is essentially no different from that of a single airport authority. The Port of New York Authority created in 1921, was the first American organization of this type.25 Since then the authority has been a common method for management of transportation facilities, examples are; the Port Authority of New York & New Jersey


(NYNJPA) operates J.F. Kennedy, LaGuardia and Newark in the New York Metropolitan area, the Port Authority of Seattle/Tacoma operates Seattle-Tacoma International airport and the newly created Metropolitan Airport Authority of Washington D.C. operates Dulles & National airports.

The authority method has several advantages in its organizational behaviour. First, it is an independent corporate agency. It can be composed as an agency with members from two states, such as the NYNJPA, or by one or more municipalities (ie. Seattle-Tacoma) or of multiple counties. The authority is structured similarly to a corporation rather than that of a state or municipality organization. This allows for more decisions to be decentralized and therefore to act more quickly on a specific problem.

Second, it is less political in operation. Once members are selected for the Board, usually without compensation, they operate independent of the political organization. The number of commissioners and the composition of the Board depends on how the State legislation establishes the authority. Each authority's Board of Commissioners, oversee the operations of the airport.26 This reduces a tremendous amount of interference by matters that are not directly or indirectly a consequence of airport operations and development.

Third, the Board is responsible for hiring the Executive Director of the

airport. The Executive Director and his staff are responsible for the operation of the airport with the Board's approval on the following types of programs:

- the annual operating-maintenance budget;
- the capital improvements program;
- the civil service program—wages & salaries;
- purchase or contracts in excess of $100,000;
- all contracts for professional services;
- airport master plans and land use plans;
- annual leases in excess of $50,000; and
- all disposition of real properties.27

The NYNJPA is an example of the organizational structure of a typical airport authority in the United States (see Appendix 2 Organization Chart 1). This example is representative of the authority structures used for this thesis. In this type of structure the business administration, aviation planning, aviation economics and marketing division as well as the human resources unit, and public service division are part of the central organization.

Each airport manager reports directly to the deputy director of aviation of the Port Authority. Each airport has its own individual organizational structure as well. Each airport manager draws upon the central functions listed above for policy and support as required. Since the NYNJPA encompasses several transportation activities, such as bridges, tunnels, ship terminals and railways, it has specialized support in the areas of engineering, real estate properties, security and legal consultation. This provides a degree of specialization and expertise to the multi-purpose authorities that does not exist at a single function authority.

27 Ibid, p. 43.
Fourth, the authority must operate without the benefit of local tax dollars, therefore management policies are required to ensure that all operating expenses are covered by operating revenues. Capital improvement expenditures are covered by bond issues and leasing agreements with the major airlines for that particular airport. This will be discussed in more detailed under financing of the airports in Section 3.5.

Fifth, the authority operates as a centralized organizational system; "possessing operational independence with internal staff capable of providing all services, including construction of capital improvements." The authority also possesses its own mandate to set policies in accordance with its goals of providing efficient service and setting charges so that the airport breaks even.

Sixth, it is adaptable to a regional approach, which makes it particularly useful in the development of interstate, joint municipal, or joint municipal and county projects (ie. Dallas/Ft. Worth Regional Airport is jointly operated by the two cities as a regional development project).

The authority method has three components to its legal framework; state legislation, the airline use-agreement, and the bond indenture. State legislation creates the authority as a legal public corporation but

retaining no taxing power. Legislation also establishes the authority as a financially independent public corporation, which means it raises its own capital through debt or equity financing in private markets. The corporation also has the right to sue and to be sued.

The airline use-agreement covers the broad area of overlapping operations between the authority and the air carriers. The agreement determines the:

1) terms & conditions governing airlines use of an airport,
2) methods for calculating rates airlines must pay for facilities & services, and
3) identify airlines' rights & privileges, for example, the right to approve or disapprove any major proposed capital development projects.\(^{29}\)

These use-agreements are an integral component of the financial procedures of the American airports. Section 3.5 of this study will examine these procedures in more detail.

3.3.3 The Federal Component of American Airport Management.

The major access to airport management by the federal government in the U.S. is the Airport and Airway Revenue Act. This Act is a federal taxing statute that imposes various forms of taxes on users of airports. This revenue is placed in the Airports & Airways Trust Fund (AATF). The Airport Airway Development Act establishes the principles for apportionment of the revenue in the AATF.

Money is granted under the Federal Planning Grant Program for Airport Master Plan Studies and under the National Airports System Plan (NASP) \(^{29}\)

to develop a 10 year nationwide plan for airports. Airport construction that conforms to these plans is granted federal money under the Airport Development and Aid Program from the AATF. As outlined in Section 3.5 this is not the major source of funds for the airports. Each airport authority is delegated the power to finance its own projects using the bond market and manage its operations.\(^{30}\) Moreover, they are expected to be self-sustaining.\(^{31}\)

In the United States prior to 1986, federal government ownership was limited to Washington National and Dulles International airports. As explained in Section 3.3.1 and 3.3.2 of this thesis the remaining majority of public airports are owned by counties, cities or an authority created jointly by the city and county.\(^{32}\)

3.4 American Aviation Growth & Technological Change.

3.4.0 American Airports and Technological Advancements.

The second wave of increased passenger movements occurred in the U.S. in the 1960s and 1970s (Appendix 2 Graphs 1-4). At the same time introduction of the wide-body aircraft (747, L1011, and DC-10) called for redesigned terminals, and strengthened runways and tarmac areas. These new aircraft, in addition to the growing number of aircraft in


\(^{31}\) Ibid, p. 68.

use, added further pressure to the congested airports and airway system. The following is a brief list of the actions by airport management at the case study airports to alleviate problems introduced by technological change and subsequent growth in traffic over time.

Atlanta's present airport site was selected in 1926 by a committee appointed by the mayor. It was originally only a 287 acres site.\textsuperscript{33} During the 1950s temporary terminals were constructed to handle the growth in traffic with a new terminal opening in May 1961.\textsuperscript{34} In 1977 a programme began which cost $280 million to complete the airport complex. Phase I was completed in 1980 and Phase II in 1985.

In Chicago in 1946 when Orchard Place Airport (O'Hare's original name) was declared surplus by the War Assets Administration, the City of Chicago purchased it and adjacent lands.\textsuperscript{35} The airport was officially opened to domestic traffic in October 1955, but did not attract significant traffic away from Midway until the introduction of large jet aircraft, which could not be accommodated at Midway airport. A new larger terminal complex was completed in March 1963 and dedicated by President Kennedy.\textsuperscript{36} In the mid-1970s further expansion of runways, terminals and cargo facilities occurred at O'Hare. At present, O'Hare appears to be the first airport headed for handling more than 50 million passengers a year (Appendix 2 Graph 3).

\begin{itemize}
\item \textsuperscript{33} Stroud John, \textit{Airports of the World}, 1980, p. 390.
\item \textsuperscript{34} ibid, p. 391.
\item \textsuperscript{35} Stroud, John, \textit{Airports of the World}, 1980, p. 409.
\item \textsuperscript{36} ibid, p. 409.
\end{itemize}
The Los Angeles International Airport site began as a private landing field by a Canadian, William M. Mines, in the 1920s. The City of Los Angeles interested in profiting from the air mail contracts being awarded by the Federal government, through the Air Mail Act 1925, leased Mines Field in 1926. In June 1930, Los Angeles Municipal Airport was officially opened. In October 1937 the City purchased the airport for $2.24 million and extensive improvements were made possible by funds made available under the Works Progress Administration (WPA) in 1938. This was to upgrade the facilities to accommodate the new DC-3 aircraft.

In May 1945, a $12.5 million bond issue was approved for purchase of 1,860 acres needed for a west extension of the east-west runway to accommodate the new larger aircraft (DC-4 & DC-6). In June 1956 a $59.7 million bond issue was needed to development the runways for jet aircraft. New "jet age terminals" were constructed in 1961 and 1962 and by the end of 1978, after experiencing heavy increases in passenger volumes from 1960-75 (Appendix 2 Graph 7), the airport commissioners approved $535 million for terminal expansion to provide capacity for 40 million passengers a year. These expenditures established Los Angeles airport in its present physical layout.

38 ibid, p. 464.
39 ibid, p. 465.
41 ibid, p. 466.
42 ibid, p. 466.
The Port Authority of New York & New Jersey (NYNJPA) is responsible for J.F. Kennedy (JFK), LaGuardia and Newark airports in the New York Metropolitan area. Each airport was started separately by their respective municipalities. The earliest of the three airports in the region was Newark Airport in the City of Newark in New Jersey. In 1928 the city purchased 68 acres to construct a municipal aerodrome. At the end of WW II it had expanded to occupied 1,400 acres.\(^{43}\)

In 1935 New York's Mayor Fiorello LaGuardia began a search for a site for a major airport. In 1929, he chose the privately owned Glenn H. Curtiss Airport, situated only eight miles from downtown Manhattan.\(^{44}\) It was 105 acres with three runways a few hangers and a seaplane base. In 1937 it was approved to be developed as a Municipal Airport and President Roosevelt approved the project for WPA funding the same year. The plan was to increase the size of the airport to 558 acres of which 357 acres had to be man-made.\(^{45}\) The airport was opened to traffic December 1939. The entire project of land-fill, runways, terminals and air tower cost $40 million.\(^{46}\)

By the end of 1941 the City of New York was planning a 1,200 acre cargo airport at the present JFK site, some 15 miles from downtown Manhattan. The cargo airport was never built but by 1945 the project had grown into

\(^{43}\) ibid, p. 497.


\(^{45}\) ibid, p. 494.

\(^{46}\) ibid, p. 494.
In June 1947, both JFK and LaGuardia were leased to the NYNJPA for future development and operation. In the following year, March 1948, Newark was leased to the NYNJPA as well.

The NYNJPA had a great deal of work to accomplish in the late 1950s at these three airports to meet the growing demands for airport facilities. By April 1964 the Port Authority had built a new runway and a new terminal complex with two-level roadway and parking spaces for 5,000 cars at LaGuardia. In March 1966 the extensions of both runways enabled LaGuardia to accommodate jet aircraft. In only 32 years, from 1947 to 1979, the Port Authority invested over $228 million in LaGuardia alone.

In the years 1952-1960 the Port Authority built at Newark; a 7,000 ft. runway, a terminal building and a control tower. By 1963 to manage the growing traffic (Appendix 2 Graph 5) the Port Authority decided to create an entirely new terminal complex at Newark on its enlarged 2,300 acre site. The estimated cost of the development was $200 million. Two of the three terminals were opened in September 1973.

At J.F. Kennedy, New York's designated international airport, planning

47 ibid, p. 487.
50 ibid, p. 498.
51 ibid, p. 498.
for the new terminal complex began in 1953. In 1954 it was decided that a centralized terminal would not be used and opted instead for a series of terminals. The first terminal, the International Arrival & Airline Buildings, was completed in 1957 at a cost $30 million. These buildings were doubled in size in 1973 to manage the growth in traffic (Appendix 2 Graph 5). In September 1959 United opened their terminal, Eastern in October of the same year, American Airlines and PAN AM in 1960 and the TWA and joint Braniff/Northeast/Northwest terminals in 1962. The final two terminals for National Airlines and joint BOAC (now British Airways)/Air Canada operations were completed in the mid-60s completing the terminal complex as it exists today.

In Seattle, Washington the city's present airport site of 906 acres was chosen in 1944 and opened as the Seattle-Tacoma airport. By 1949 it had a permanent terminal and its runway lengthened to accommodate the largest aircraft (DC-4 & DC-6) of the 1940s. From 1969-72 Sea-Tac International Airport, as it is now known, underwent large scale development to meet traffic demands (Appendix 2 Graph 7). Two parallel runways and the existing terminal complex and underground people-mover system were completed to accommodate the larger aircraft and passenger loads. By 1972 it had expanded to occupy its present 2,000 acres.

In Washington D.C., Washington National and Dulles were the only two

52 ibid, p. 488.
53 ibid, p. 490.
54 Stroud, John, Airports of the World, 1980, p. 542
55 ibid, p. 542.
federally operated airports in the United States. Washington National Airport was opened in 1927 and merged with Hoover Field in 1930 since operating two airports side-by-side was obviously dangerous and inefficient. Hoover Field is now the site of the Pentagon. The present Washington National Airport was chosen by President F. Roosevelt in September 1958, after nearly 10 years of debate on where it should be sited. Funds were available from the WPA and Public Works Administration, plus the Civil Aeronautics Act 1938, which gave the Federal Government permission, for the first time, to construct and own commercial airports. The airport was opened to traffic in June 1941 with four runways. In November 1950 major expansion took place at the terminal and again in 1955 to expand the terminal and runway layout to its existing pattern. In November 1959 the FAA banned all jet operations at Washington National but in April 1966 opened it again to twin and three-engine small jet aircraft (ie. DC-9, 727, 737).


Air passenger movements in the U.S. are significantly larger in magnitude than their Canadian counterparts in terms of the major metropolitan airports. Statistics reveal that many of the American airports reached the levels of passenger & aircraft movements of Canadian airports of 1985 in the mid-1960s (Appendix 2 Graphs 1, 3, 5 & 7).

In general the growth cycles occurred fifteen years earlier in the

United States. This is not to imply that Toronto or Vancouver, Canada's first and second busiest airports, will be handling 35-45 million passenger in 2000 as are Chicago and Atlanta today. The size of the domestic market in the U.S. is ten times that of Canada and their economy attracts larger numbers of business and tourist travellers.

In the twenty year period between 1960-80 air passenger movements at American eastern airports were increasing at incredible rates (see Table III). The corresponding changes of aircraft movements at these airports were equally impressive (see Table III and Appendix 2 Graphs 1 & 5). Dulles airport was not opened until 1965 and therefore not included in these statistics.

As shown in Table III passenger volumes in the period 1980-84, with the exception of Newark airport, are all significantly lower than the average five-year periods during the 1960-80s period. Newark's recent surge in passenger traffic and aircraft movements can be wholly attributed to PeopleExpress (now a Texas Air subsidiary) using this as their main hub airport in the east.

At LaGuardia, traffic increased from 242,000 aircraft movements and 4.1 million passengers in 1960 to over 314,600 movements and nearly 17.5 million passengers in 1980. This represents a 130% growth in aircraft movements and a 423% growth in passengers over twenty years or an average 6.5% and 21.2% per annum growth rate respectively.
### TABLE III

**U.S. EASTERN AIRPORTS**

**PASSENGER & AIRCRAFT MOVEMENTS**

<table>
<thead>
<tr>
<th>AIRPORT</th>
<th>VOLUME (MILLIONS)</th>
<th>PERCENTAGE CHANGE</th>
<th>5-YEAR AVERAGE % CHANGE</th>
<th>PERCENTAGE CHANGE 1980-1984</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PASSENGERS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J.F.KENNEDY</td>
<td>8.812</td>
<td>304</td>
<td>76</td>
<td>11</td>
</tr>
<tr>
<td>LAGUARDIA</td>
<td>4.120</td>
<td>423</td>
<td>105</td>
<td>16</td>
</tr>
<tr>
<td>NEWARK</td>
<td>3.009</td>
<td>306</td>
<td>77</td>
<td>256</td>
</tr>
<tr>
<td>ATLANTA</td>
<td>2.228</td>
<td>1794</td>
<td>449</td>
<td>-2</td>
</tr>
<tr>
<td>NATIONAL</td>
<td>4.725</td>
<td>181</td>
<td>45</td>
<td>11</td>
</tr>
<tr>
<td><strong>AIRCRAFT MOVEMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>J.F.KENNEDY</td>
<td>.274</td>
<td>112</td>
<td>28</td>
<td>3</td>
</tr>
<tr>
<td>LAGUARDIA</td>
<td>.242</td>
<td>130</td>
<td>33</td>
<td>12</td>
</tr>
<tr>
<td>NEWARK</td>
<td>.188</td>
<td>105</td>
<td>26</td>
<td>79</td>
</tr>
<tr>
<td>ATLANTA</td>
<td>.219</td>
<td>242</td>
<td>61</td>
<td>29</td>
</tr>
<tr>
<td>NATIONAL</td>
<td>.316</td>
<td>-65</td>
<td>-16</td>
<td>-8</td>
</tr>
</tbody>
</table>

The rates of change in the number of aircraft movements during the 1980-1984 period are all significantly lower than the average five-year periods during the 1960-80s period with the following two exceptions.

First, the net decrease in aircraft movements at National airport is a result of an FAA imposed ceiling of 200,000 aircraft movements per year to be in effect by 1982. Future flight movements in the Washington D.C. area must use Dulles International or nearby Baltimore-Washington Friendship airport. Second, the strong growth in aircraft movements at Newark is a reflection of Continental's hubbing operations at this airport.

The large increases in both passenger and aircraft movements at Atlanta airport occurred mostly between 1970 and 1980 as Delta and Eastern airlines hubbing activities in Atlanta expanded rapidly (Appendix 2 Graph 1 & 5). Atlanta's airport in 1978 was the second busiest airport in the U.S. for passengers handled (see Appendix 2 Graphs 2 & 4). Yet only twenty years earlier in 1958 it was ranked thirty-fifth in the United States.

American western airports experienced even larger percentage changes in passenger traffic in this twenty year period (see Table IV and Appendix 2 Graphs 3 & 7). Corresponding growth in aircraft movements was not as high. Both Chicago and Seattle experienced significantly larger increases in aircraft movements over Los Angeles and Denver.
In Denver, Stapleton International Airport's experience of large increases in passenger volumes but corresponding low increases in aircraft movements is partially attributable to the replacement of smaller aircraft with larger ones (ie. DC9s replaced by DC8s, 707s, 727s, DC10 and 747s). The second factor was the increased hubbing activity by Western and Continental airlines at Denver in 1979. In 1985 it was the fifth busiest airport in the U.S. handling just under 30 million passengers (Appendix 2 Graph 4).\footnote{Mosteller Dee, "Denver's Stapleton Airport: A good place to watch Deregulation", \textit{Air Transport World}, Nov. 1986, p.64.} It was designed to handle only 18 million.
## TABLE IV

U.S. WESTERN AIRPORTS
PASSENGER & AIRCRAFT MOVEMENTS

<table>
<thead>
<tr>
<th>AIRPORT</th>
<th>VOLUME TOTALS (MILLIONS)</th>
<th>PERCENTAGE CHANGE 1960-1980</th>
<th>5-YEAR AVERAGE % CHANGE</th>
<th>PERCENTAGE CHANGE 1980-1984</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PASSENGERS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHICAGO</td>
<td>5.690</td>
<td>758</td>
<td>190</td>
<td>2</td>
</tr>
<tr>
<td>(O'HARE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DENVER</td>
<td>1.699</td>
<td>1227</td>
<td>307</td>
<td>38</td>
</tr>
<tr>
<td>LOS ANGELES</td>
<td>6.605</td>
<td>501</td>
<td>126</td>
<td>4</td>
</tr>
<tr>
<td>SEATTLE</td>
<td>1.635</td>
<td>562</td>
<td>132</td>
<td>13</td>
</tr>
<tr>
<td><strong>AIRCRAFT MOVEMENTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHICAGO</td>
<td>.245</td>
<td>291</td>
<td>73</td>
<td>2</td>
</tr>
<tr>
<td>(O'HARE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DENVER</td>
<td>.297</td>
<td>106</td>
<td>27</td>
<td>62</td>
</tr>
<tr>
<td>LOS ANGELES</td>
<td>.289</td>
<td>181</td>
<td>45</td>
<td>5</td>
</tr>
<tr>
<td>SEATTLE</td>
<td>.081</td>
<td>262</td>
<td>66</td>
<td>5</td>
</tr>
</tbody>
</table>

A noticeable trend at many airports, in the east and west, has been the shift in growth from increases in just passenger traffic as experienced in the 1960-1980 period, to large increases in aircraft movements in the 1980-84 period. This development reflects the trends of Mega-Carriers formation and their use of "hub-&-spoke" operations. These trends are outlined in Section 3.4.2 and 3.4.3 of this thesis.

3.4.2 Mega-Carriers and American Airports.

The deregulation of the U.S. domestic airline industry in 1978 and the relaxing of enforcement of Anti-Combines legislation in American in the 1980s, has increased merger activity in the transportation industry and has led to the creation of "mega-carriers". The mega-carrier was defined in Section 2.4.2 of this study. American examples of the single company mega-carrier are; Delta (Delta & Western), Northwest Orient (Northwest & Republic), and TWA (TWA & Ozark). Texas Air (merger of Eastern, Continental, PeopleExpress, Frontier and New York Air) is the major example of the mega-carrier which is a parent company but still uses the merged airline's separate logos.


With respect to airports, these developments in some cases have created virtual control of gate space at several of the major U.S. airports by one or two airlines (ie. United & American Airlines in Chicago, Delta & Eastern in Atlanta, Texas Air in Newark, Texas Air & United in Denver, and Texas Air & United in Dulles). This has made it difficult, if not impossible, for new airlines to enter service into these cities. The presents of a mega-carrier restricts the airports ability to diversify their sources of revenue (ie. from landing fees and gate leasing) and subjects it to economic uncertainty if anything happens to these mega-carriers (ie. decision to pull-out or bankruptcy).

3.4.3 Creation of the Airline "hub-&-spoke" Network - 1980.
In the early 1980s as a result of the Deregulation Act the airlines created the "hub-and-spoke" system for increasing the utility and yield factors of their equipment. The hub-and-spoke system was to replace the traditional point to point route systems that existed from the 1940s. Appendix 1 Diagram 1 compares how these systems work.

As noted in aviation literature, although the hub-and-spoke system improved the airlines efficiency and created new opportunities and access for many travellers, as were the goals of the Deregulation Act, it has created severe capacity problems for the hub airports.61 Major

congestion levels are being reached as airlines try to add more flights and "Feeder" connections at the hub airports. Many of these major U.S. airports, as is the case in Canada, do not have sufficient airside room or gate space for this change in airline operation. This congestion producing method of operations has also sparked growing incidents of near mid-air and on-ground collisions at these major airports. The runway congestion problem is rapidly growing as well. These developments have lead to an overall inspection of the American system with respect to safety of operations.

American airport management has taken action to try to alleviate these problems. Some $12 billion has been dedicated to airport construction work in the next few years to easy congestion from growth in the 1970s and to prevent further capacity problems in the 1990s and beyond. The scale of activity is almost beyond comprehension when compared to Canada's top nine airports. In Canada it is estimated that only $1.4 billion would be required to alleviate its airport and airways

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congestion problems. The following is a list of what that $12 billion will buy in projects that relate to the American airports of this study.

To manage hub-and-spoke growth Atlanta/Hartsfield has begun a $9.8 million contract to begin construction of phase one of the second international concourse of its 20 year master plan. Hartsfield is also adding a 378 acres site to its cargo facility.

At Chicago's O'Hare airport $1.6 billion is being dedicated to a 13 year master plan begun in 1982. This will raise the airports capacity from 45 million passengers to 85 million. New terminals are being constructed for both United and American Airlines hubbing operations; these two airlines account for two thirds of O'Hare's traffic. The airport is spending $138 million of its funds to improve a people-mover system to remote car-parks.

At Dallas/Ft. Worth International, Delta Airlines is spending $45 million to expand their passenger facilities from 24 gates to 33 gates to handle their increased number of flights at this hub airport. Completion date is set for late 1988.

In Denver, the major hub airlines, United & Continental, say that they


68 ibid, p. 29.

69 ibid, p. 31.
are being congested because of lack of gate space. A renovation program begun in 1984 will cost the airport $275 million. An additional $130 million is being spent by United to enlarge its concourse and $75 million by Continental for their facilities. This $480 million expenditure will be only for the short term (5-8 years), until a new airport is built in the 1990s at a cost of $1.2 billion. The new airport occupying 10,872 acres of agricultural land will be in operation by 1990, some six miles east of the present Stapleton airport. This will double the commuting distance from Denver. It will have 5 runways and be able to handle 100 million passengers by 2020.

Los Angeles International Airport is spending $94 million to modify Terminal Two in conjunction with its five major occupants (Air Canada, Hawaiian Air, Northwest Orient, PAN AM, and People Express). This follows the opening of a brand new $80 million terminal in 1985 (the Thomas Bradley Terminal).

In New York City the "Kennedy 2000" Plan calls for an expenditure of over $1.5 billion at J.F. Kennedy alone. One billion of this fund will be spent on the restructuring of the road system to access the airport, a new public transport link to the city center, and a new


72 ibid, p. 27.

people-mover center connecting all eight terminals. A $500 million 48-gate terminal is also being constructed for PAN AM and is expected to be operational by 1993. At Newark International Airport NYNJPA is building a $175 million terminal and leasing it to PeopleExpress (purchased by Texas Air Corporation 1986) for 25 years. It will be completed in 1987.

In Seattle, Seattle-Tacoma International Airport has drawn up an extensive master plan for its development in both the long and short term to accommodate domestic and trans-Pacific hub traffic. Expansions plans include; expansion of the main terminal, additional parking and cargo facilities and commuter aircraft ramp space. The first phase is a $21 million extension to the main terminal. The extra capacity is required, in part, to meet United Airlines demands for its newly acquired Pacific routes from PAN AM.

Finally, in Washington D.C., both Dulles and National airports are upgrading their facilities to cope with increases in traffic (Appendix 2 Graph 2). A $100 million renovation is being planned for National Airport, focussing on parking improvements (cars), baggage handling and the north terminal. Dulles International has major facilities shortage problems with three major airlines (Continental, United, & PAN AM) hubbing there, in addition to the increase in services of airlines that already served it (New York Air, US Air, Eastern, Presidential, American Airlines). From a passenger count of 2.5 million in 1982, to 5.1 million in 1984 and flights doubling in that period to 88,700,

74 ibid, p. 31.
Dulles needs to expand quickly to manage this growth. 75

None of the $12 billion figure includes any of the funds supplied by the FAA on airways expenditures through the AATF. These funds can be quite substantial and are necessary for maintaining a safe navigation and air traffic control system.

75 ibid, p. 31.
3.5 **American Airport Financing.**

3.5.0 Approaches to Financial Management.

Airport authorities in the United States tend to use one of two approaches of financial management; a *Residual Cost Approach* or a *Compensatory Cost Approach.* The airports used in this thesis are almost evenly split between the two approaches. The municipally operated airports in this group seem to favour the Residual Cost approach as seen below:

<table>
<thead>
<tr>
<th>CITY</th>
<th>FINANCING</th>
<th>MANAGEMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atlanta</td>
<td>Residual Cost</td>
<td>Municipal Department</td>
</tr>
<tr>
<td>Chicago</td>
<td>Residual Cost</td>
<td>Municipal Department</td>
</tr>
<tr>
<td>Dallas</td>
<td>Residual Cost</td>
<td>Joint City Department</td>
</tr>
<tr>
<td>Los Angeles</td>
<td>Residual Cost</td>
<td>Municipal Commission</td>
</tr>
<tr>
<td>Seattle</td>
<td>Residual Cost</td>
<td>Airport Authority</td>
</tr>
<tr>
<td>Denver</td>
<td>Compensatory</td>
<td>City/County Department</td>
</tr>
<tr>
<td>New York</td>
<td>Compensatory</td>
<td>Airport Authority</td>
</tr>
<tr>
<td>Washington DC</td>
<td>Compensatory</td>
<td>Airport Authority</td>
</tr>
</tbody>
</table>

Under the *Residual Cost* approach the airlines assume the largest risk. They pick up all expenses not covered by other sources of revenue. The airlines also has more input in capital investment decisions because of their long-term use-agreements.

The *Compensatory Cost* approach requires the airport operator; municipality (department or commission), state, or authority, to assume the major financial risks. The airport operator sets the fees to be charged to airlines and other airport tenants to recover the costs.

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The Compensatory method gives the airport operator a stronger say in capital investments decisions. Usually there are shorter use-agreements, under the compensatory method, therefore no guarantees that airport operations will break even since revenues of the airlines are not directly tied to covering costs of the airport. The Congressional Budget Office study in 1984 found that 42% (10 of 24) of the largest and 42% (15 of 36) of the medium sized airports, operate as Compensatory Cost airports.\textsuperscript{77}

3.5.1 The use of Majority-in-Interest Clauses.

In many of the major hub airports, long term "majority-in-interest" clauses exist between the major airlines and the airport (ie. Chicago O'Hare-United, Los Angeles-Western, Salt Lake City-Western, Atlanta-Delta & Eastern, Denver-United & Continental, Newark-PeopleExpress, Dallas-American Airlines). These majority-in-interest clauses give preference to these airlines for gate space, counter & check-in area, landing & take-off slots, and baggage handling.

Majority-in-interest clauses are more common of airport use-agreements at residual cost airports than at compensatory airports. A study by the Congressional Budget Office (CBO) in Washington D.C. in April 1984, on financing of airports, found;

1) 75% of large commercial airports, using residual cost approach (11 of 14) have some form of majority-in-interest clause in their use agreements;
2) 67% (14 of 21) medium size commercial airports, in residual cost approach have similar clauses,
3) only 10% of large airports (1 of 10) under compensatory approach has this clause,

\textsuperscript{77} Ibid, p. 20
4) 33% (5 of 15) of medium size airports using compensatory approach have this clause.\textsuperscript{78}

The CBO study found that 58% (14 of 24) of the largest and 58% (16 of 36) of the medium sized airports, operate as Residual Cost airports.\textsuperscript{79}

The CBO study also revealed, residual cost airports have longer term use-agreements than compensatory airports.\textsuperscript{80} The reason is, residual cost agreements have been designed to provide security for long-term airport revenue bond issues, and the length of the term of the use-agreement with the airline guarantee of debt service, generally has coincided with the terms of the revenue bonds. The CBO study found;

1) 90% of large (13 of 14) commercial (residual cost) airports have agreements of 20 years or longer,
2) 75% of medium (16 of 21) commercial (residual cost) airports have agreements of 20 years or longer,
3) 60% of large (6 of 10) commercial (compensatory approach) airports have agreements of 20 years or longer,
4) 40% of medium (6 of 15) commercial (compensatory approach) airports have agreements of 20 years or longer.\textsuperscript{81}

These different approaches to financing influence an airport's ability to; accumulate retain earnings, establish majority-in-interest clauses with major airlines and determine the length of the use agreement, which all have important effects on an airports performance in the bond market.

\textsuperscript{78} Ibid, p. 25.


\textsuperscript{80} Ibid, p. 25.

3.5.2 Bond Issue Types: General Obligation & Revenue Bonds.

There are two approaches for bond issuer's to pay interest and repay principals; General Obligation Bonds, and Revenue Bonds. The general obligation bonds are fully backed by a government. The revenue bonds are backed by user fee revenues to be generated in the future by the developed facility. In recent times there has been a dramatic increase in the use of revenue bond financing of airports because of their tax-exempt status. For example, in 1970, 34% of all tax exempt bonds were revenue bonds, by 1982 this had risen to 73%. In fact, between 1978-1982, 92% of all airport bond sales were revenue bonds.82

The following is a brief example of how retain earnings, majority-in-interest clauses, length of use-agreement and bond markets, work in conjunction with each other. Seattle-Tacoma International airport, in the midst of a $150 million expansion project in 1980, signed majority-in-interest clauses on 29-year leases with its airlines in 1970.83 The charges were calculated at 35% of the total needed to retire the revenue bonds. The 35% surplus (a retained earning) was transferred to a reserve and capital improvement fund to expand the airport in the 1980s.

3.5.3 Impacts of Airline Deregulation on Airport Financing.

Since deregulation in 1978, three important trends in airport financial management were noted by the CBO study. First, there has been a trend

82 Ibid, p. 32.

towards shorter term contracts with respect to airport use agreements, non-airline leases and concessionaires contracts. Second, there has been a modification of the residual cost approach, with more airports moving towards the compensatory cost approach because of the airlines declining interest in having their revenues tied to airport development through the traditional majority-in-interest clauses. Third, airport managers have stepped up their efforts to maximize revenues. They have done so by strengthening and diversifying their revenue base through providing more space for shops, constructing hotels on airport property and increasing access for commuter airlines to boost landing fee income.

Airports in the U.S. will need over $30 billion during the next ten years (1985 - 1995) to handle the increase in traffic levels. The Airports Operators Council International (AOCI) stated in 1985 that $11.2 billion of this amount will be required at primary commercial airports, and $1.76 billion at reliever airports alone. However, finding the money for airport construction in the U.S. is becoming increasingly difficult.

The US Treasury wants to remove the tax-exempt status of airport revenue bonds, which fund over 90% of major airport construction as stated earlier. The Congress Joint Tax Committee says the treasury will lose $3.1 billion between 1986 and 1990 as a result of not taxing airport and seaport revenue bonds. This effects the major airports the most, the

85 ibid, p. 14.
ones experiencing the most growth at the moment, because they have funded the majority of their development using the bond system.

The bond system has several choices; the airport revenue bond (backed by an airport authority's or carrier's profitability depending if a residual or compensatory airport), special facility bonds (backed by individual carriers for terminal or gate development), or a general obligation bond (backed by the city or county which owns the airport).

As airports have in the past been regarded as public utilities the investors paid no tax on the bonds, and the airports benefited by paying back low interest rates. However, the federal government in the U.S. argues, under deregulation airports have become commercial enterprises and must trade their bonds on the open market. At present, the airport revenue bonds are traded through a dealer who secures buyers that will purchase major issues at one time.

3.5.4 The Future of the Airport and Airways Trust Fund (AATF).

Airport operators are concerned that they may also lose federal funding from the Airport & Airways Trust Fund (AATF). The AATF expires in October 1987. This fund is financed by the federal taxes on airline tickets, aviation fuel, departures, freight waybills, and through general tax sources in the AADRA 1970 described in Section 3.1. It is estimated to contain uncommitted funds in excess of $5 billion as of

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The airports and airlines are lobbying Washington for several issues to be resolved. One, release the AATF to the airports for construction and improvements for navigational, runway, and terminal improvements. Two, abolish the AADRA 1970 if the federal government is not going to turn over the revenues raised from it for airport use. This would allow the airports to tax individual carriers and users instead of the double taxing that is presently occurring at several airports. Three, if the AADRA 1970 and the AATF are to remain, that the AATF be removed from the federal governments general accounting practices. The American federal government is accused of holding the AATF so as to give the impression that its overall deficit is less than it actually is.

87 ibid, p. 21.
3.6 Impact of Political Suasion on American Airport Management.

3.6.0 Political Suasion and American Airport Management.

In the American methods of airport management the majority of the authority for their operations is less political than in Canada. This has evolved in all three methods (City Department, City Commission or Airport Authority) because of government policy (Air Commerce Act 1926) that airports must be self-sufficient on a cost recovery basis. The only exception is, if the airport qualifies as part of the NASP (National Airport System Program) then the federal government contributes funds over what the individual airports raise through bond issues.

The greatest chance for political suasion occurs with the municipally owned airport operated as a separate Department of the City (see Flowchart 2). In the U.S., political influence is concentrated on the local level because of constitutional powers as opposed to the federal level as is the experience in Canada. In the case of municipally owned airports, local politicians must be able to show cause for an airport's development and to deal effectively with airport problems. Therefore, all administrative decisions made by a Department of Aviation, as part of the civic bureaucracy, are subject to Council's approval and thus subject to political suasion. The Department of Aviation must compete with other departments for Council's time to convince them to approve general obligation bonds for airport development as oppose to other
FLOWCHART 2
MUNICIPAL
DEPARTMENT OF AVIATION
METHOD OF MANAGEMENT

CITY COUNCIL

DEPT. OF PARKS  DEPT. OF PLANNING  DEPT. OF TRANSPTN  DEPT. OF ENGINEERING  DEPT. OF AVIATION

Final Decisions - Political

Final Decisions - Administration

Route of Decisions

Reports To
municipal works (ie. roads, transit, sewage, parks, etc.).

Under municipal airport commission management the city loses some of the abilities of political suasion over airport development because, airport operations has been given some independence from the political process (Flowchart 3). Conflicts between the airport commission and municipal land use planners can be kept in check by effective land use zoning within the immediate vicinity of the airport and under the approach paths to the runways.

In both the departmental and commission methods of management the role of the federal government is minimal. The federal government in the U.S. is not involved with daily operational decisions, or the long-term investment decisions of these major airports. The only interface is the FAA's monitoring safety & navigational issues, and some funding from the AATF for airways and runway construction.

With the airport authority method of management in the U.S., the political demarkation between the airport authority and the government is much more distinct than with the department or commission approach (see Flowchart 4). The municipal government is unable to exercise direct control over these authorities. The airport authority's autonomy is almost absolute. This translates into very little potential for direct federal or municipal political suasion over airport operations.

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FLOWCHART 3

MUNICIPAL AIRPORT COMMISSION
METHOD OF MANAGEMENT

CITY COUNCIL

BOARD OF COMMISSIONERS

AIRPORT MANAGER

AIRPORT OPERATIONS

MAYOR

Final Decision
Political

Final Decision
Administration

Route of Decisions

Reports To
More than one Government body (ie., City Councils, Regional Governments, or State Legislations) can be responsible for appointing members to the Airport Authority's Board.
Equally, the authorities are not subject to standard political accountability mechanisms. As a result of this separation different mechanisms are used to allow for some control by the federal and municipal governments over airport authorities actions. The federal government simply uses a monetary incentive, providing grants through the AATF and NASP programs in exchange for cooperation. The municipal input is obtained through the election process to the Authority's Board of Commissioners. The airport authority usually requires that at least one position be for a politician from the most concerned municipality with respect to airport development.

3.6.1 Accountability of Political Suasion.

Airport management's accountability as a department of the city, is quite high as the director reports directly to the Council. The responsibility of the airport also lays directly with the City Council. This may have advantages for appearance sake to the local voter but may prove too narrow a view if the City Council is not actively engaged in monitoring world activities in the aviation industry.

Airport management accountability as a commission, is lower than the department management method but higher than the authority method. The commission reports to the Council but is independent of the city bureaucracy. The responsibility still lies with the city Council but the commission acts on the city's behalf on managing and developing the airport, using the commission's aviation members expertise. This direct participation by aviation members helps to broaden the view of the management of the airport for opportunities for the airport which will
be commercially successful and bring growth to the city.

The authority method of management is the least politically accountable in operation. It is an independent corporate agency created by State legislation. It is structured as a corporation which means more decisions are decentralized and therefore less time consuming than in a politically influenced body. This allows the authority to act more quickly in implementing decisions than its departmental or commission counterparts.

The accountability to the local government is greatly reduced under the authority method because it is totally independent of the formal municipal political process for decision-making. Once members are elected to the authority in a separate election, they operate independent of the municipal, state and federal political organizations.

3.6.2 Flexibility of Political Decisions.

The flexibility of the department's actions is low in comparison to the commission and the authority methods. It takes time for the action to be scheduled and brought up again in Council. The reversibility of the action is low as well. The nature of a department bureaucracy usually impedes change or modifications.

The flexibility of the commission's actions is moderate in comparison to the department and the authority methods. The commission is granted the ability to function more independently of council than an aviation department but any major funding or expansion decision will require the
Council's decision. Council approval is required if the funding will require general obligation bonds.

The flexibility of the authority's actions are the greatest of the three. Since it is separated from the municipal political process and raises its own funds independently it can change directions quite quickly as trends and demands fluctuate in the aviation industry.

3.6.3 Hidden Agenda of Political Decisions.

The Hidden Agenda or "fog factor" refers to the ability of the department to disguise its true objectives and avoid criticism for otherwise "questionable" development. In the case of the municipal department of aviation the "fog factor" component is low. The department of aviation actions are highly visible because, as a government department it must seek authority from Council before implementing policy. Consequently the politicians on Council want to be kept informed of the department's actions because of possible backlash from the local public (ie. concerns about safety, noise, and traffic congestion).

Criticism over costs for airport development would be lowest and least hidden in the case of residual cost approach municipal airports because, individual carriers are the guarantors of the revenue bonds. Chicago & Los Angeles International airports operate as municipal airports and use residual cost approach for funding.

The Compensatory Cost approach airport, which operates as a Department
of Aviation (i.e. Denver-Stapleton), will have a Council aware of possible higher public concern over costs of airport development since the general obligation bonds commit municipal taxes as the guarantor of the bonds.

The ability of an airport commission to disguise its true objectives and avoid criticism of "questionable" development is greater. The commissions actions are less visible than the department method of management because it is not totally controlled by political process. The commission may endorse actions (i.e. increased flights or increased peak congestions) that would maximize the commercial interest of the airport but would create political problems for the politicians (i.e. consequential increase in noise and concern for safety of operation by citizens living on approach paths).

Criticism by the public will also remain low with this method of management because its expansion funds are raised through the bond market and its operating expenses are covered by operating revenues, as is the case of all municipal airports in the United States. Similar to the departmental method, the commission residual cost airport (i.e. Atlanta & Dallas), will have the least public criticism over funding. The commission run compensatory airport may experience more criticism from Council if the commissioners are at differences from what the politicians want from the airport in an overall strategy for the development of the city.

The ability of the authority to disguise its true objectives and avoid
criticism in a political process is quite high because of their operational independence from this process. However, they must operate without benefit of local taxes and must raise capital in the bond markets. This method of financing calls for detail plans of what is being constructed and therefore revealing what the authority's objectives really are.


As a department, the speed of implementation for a policy initiative is the slowest of the three management methods. As discussed earlier, the complexity of managing a large city's government, the airport department may suffer at the expense of budget and time demands on Council for other issues.

As a commission, the speed of implementation is quicker than the department method but slower than the authority method because it still requires the approval of Council. Approval from Council can be time consuming depending on the other issues demanding their time.

The localized nature of the authority, with direct input available from the municipal council, local business community and airport users (ie. major airlines) can implement its decisions the quickest. It is the mayors and local businessmen who normally sit as commissioners or directors of the local authority. As such they are more attuned to the local needs and concerns of the community. Since all major parties are part of the process firsthand, once the Board of Directors agree on the airport issue their decision can be put into effect without extended
political interference. Lack of meaningful local participation is a strong criticism of the present system of airport management in Canada.89

3.6.5 Social Costs of Political Suasion.
The social cost of political suasion for the department method of airport management is the same as any other municipal department. In comparison with the commission and authority methods of management it is probably the highest. As a department it requires more resources and time than the commission & authority methods to keep in contact with the other departments, airport users and the general public. Because it raises funds through the bond market, it is more conscious of actions, such as political suasion, which increases costs, than the ministry approach used in Canada which is financed and operated by the federal government.

Under the departmental method of management the decision for airport expansion remains under the control of the local politicians & bureaucracy of a department of aviation. Airline input is indirect through their commitment in majority-in-interest clauses if a residual airport, or on an advisory board if a compensatory airport.

The social costs of political suasion for the commission method of airport management are less than the departmental approach. The

municipally owned airport run by a Commission management is one step removed from the political influence of the departmental municipal airport. The commission is comprise of both elected officials and individuals interested in aviation for civic as well as commercial development. In this case, the commission does not have to compete on the same level with other departments for Council's time.

The commission approach is more aware of its costs and revenues because it utilizes private business expertise as direct board members. The manager of the commission is a businessman who realizes the importance of maximizing the benefits and profits from the expenditures of resources at their disposal while keeping the cost down for airport users. Unproductive political suasion is discouraged since it consumes resources that are not beneficial to airport operations.

Social costs of political suasion are minimized under the authority method because it is the least political in operation. As a business the authority strives to maximize their gains on any expenditures of resources. The Port Authority of New York & New Jersey operating the three New York airports and the newly created Metropolitan Washington Airports Authority are compensatory cost approach authorities. Seattle-Tacoma airport is a residual costs approach authority. In these preceding examples the compensatory cost airports should be more cost conscious since it is their own obligation bonds (not New York City or the District of Columbia) that are the guarantors of any bonds issued. The residual cost airport has the airlines additional commitment if their is a short fall in operating revenues or a run over in capital
projects. This heightened awareness in their resources and costs makes the authority the most attentive in reducing unproductive political suasion activities by all levels of government in order that the public receives airport facilities at the least cost.

3.7 American Airports: Balancing Community & Management Goals

3.7.0 Airport Development and Community Input.

In the United States, in some cases, the officials responsible for the development of aviation facilities, are the same officials responsible for formulating and implementing land-use plans in the immediate vicinity. The American practice of utilizing municipal officials or airport authorities to manage the nation's airports is considered the most decentralized system of airport management in the world.\footnote{Feldman Elliot J. & J. Milch, "Options on the Metropolitan Fringe: Strategies of Airport Development", National Resources & Urban Policy, 1980, p. 221.}

The federal Department of Transportation (DOT) only supervises the development of operational policy of the airports in the system and, only provides financial and technical assistance for construction relating to navigational & airway projects. The federal government did not construct or operate any metropolitan commercial air facilities in the United States, with the exception of the two Washington D.C. airports up until 1986. These airports serve the District of Columbia and therefore were under the jurisdiction of the federal government. In 1986 these two airports were turned over to an airport authority for
development.

In several of the cities studied; Atlanta, Chicago and Los Angeles, the city government has total responsibility for the airport developments. Dallas/Fort Worth Regional Airport is managed by a board of representatives from the two cities. In these cases, the municipal governments have considerable influence over the decision-making process. In some situations, as with O'Hare Airport in Chicago, this has not been to the advantage of the metropolitan region.

Chicago's O'Hare is firmly linked to local government as a departmental residual cost approach airport. Geographically, O'Hare is located in the suburbs and only linked to Chicago by the city-owned Kennedy Expressway. An organized suburban coalition, the Suburban O'Hare Commission, a group of fifteen northwest suburbs plus DuPage County surrounding Chicago, is lobbying for a regional airport authority to operate O'Hare and Chicago's two other major airports (Midway and Meigs Field). The coalition is seeking a voice in determining how many flights land at O'Hare, at what times and with what kinds of aircraft. There efforts are being supported by politicians of surrounding municipalities (ie. Martin Butler-Park Ridge Mayor).

The Suburban O'Hare Commission, want the Illinois legislature to establish a regional authority so that they all have a say in future O'Hare developments. The State legislature can do this (as was done in

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91 The Official Airline Guide, "Who owns O'Hare", Frequent Flyer, December 1986, New York, p. 34.
the New York and Seattle-Tacoma regions) but the City of Chicago is resisting. The City does not want to share the power of controlling the airport.

The financial burden of modernizing airports for the heavier jet aircraft and more sophisticated navigational and runway technology, forced many municipalities to abdicate their responsibilities of airport management. Since World War II, similar to the Canadian situation, the direct participation of local officials in airport development in the U.S. has declined. This has lead to a rise in popularity of the authority method of management to replace direct municipal management, not participation of the Federal government, as was the case in Canada. The public authority is managed by more operational & business oriented managers than in a civic department.

In the U.S., be it a department, commission or an authority, when dealing with airport development the primary objective in the past has been to meet traffic demand by functioning as a well-managed business. This becomes a cyclical justification for airport management to develop airport facilities.

For example the NYNJPA as an authority backed by its own revenue bonds is organized to encourage development, which may not be to the best interest of the community at large. As more development is provided, managers.


93 ibid, p. 222.
more traffic tries to use the airport, resulting in the need for further development to meet the demand. When an airport authority is in charge they can proceed with this strategy regardless of the neighboring municipal councils plans for land development in the area.

In the Chicago case, the American municipal management method is quite similar to the Canadian federal situation with respect to the Draconian methods which can be used to push development though. In the U.S. the reasons for development are usually based on economic pressure directly related to the airport. In the Canadian case the cause may be for political reasons unrelated to aviation developments.

The American options for airport land-use development strategies are the same as outlined for Canada; environmental airports, expansion of existing airports, or the "no-build" strategy. These options were explored much earlier in the U.S. because passenger traffic volumes increased at an earlier stage than in Canada (see Appendix 2 Graphs 1 & 3 and in Appendix 1 Graphs 1 & 3). The magnitude of the growth of traffic has also been on a much larger scale in the United States than in Canada.

3.7.1 Solution One: The "Environmental" Airport.
To build an "environmental" airport required that enough land be purchased in an area removed from populated regions to guarantee future aviation development without interference by conflicting land uses. Examples of this practice are: Chicago O'Hare (1948), New York's LaGuardia (1939), JFK (1947) and Los Angeles (1945). All are examples of
when land prices were still uninflated by suburbanization trends and the existing airport management purchased property with a long term plan in mind.

By the late 1950s and early 1960s many of the American cities had large scale suburban developments and the purchase of large tracts of lands accessible to the downtown core were not feasible. To create the "environmental" airports of the 1960s, Dulles (1962) and Dallas/Ft. Worth (1968), required direct U.S. federal intervention into airport management.

The method of intervention by the Federal government to create Dallas/Ft. Worth Regional Airport in Texas was only to establish a committee to determine where and how a regional airport could be built to serve both Dallas and Fort Worth (Section 3.2.3). In the case of Dulles airport, outside of Washington D.C., the federal government actually decided to manage the airport, which made it the second major commercial airport that was federally controlled.

3.7.2 Solution Two: Expansion of Airports

Many cities expanded their existing airports between 1950-80 to maximize the use of land already in airport & aviation use as documented in Section 3.1 and 3.4 of this thesis. Examples of this are Atlanta, Denver, Los Angeles, Newark, J.F. Kennedy, LaGuardia, Seattle and Washington National airports as described in Section 3.4. In all of these cases as municipal management or as an authority, airports were expanded to meet the demands of the airlines. There was little attempt
to modify traffic operations (ie. peak congestions) to reduce the infrastructure needs (ie. larger terminals, more runways, large parking lots).

3.7.3 Solution Three: The "No-Build" Option.

The option to not build, but instead to find methods to spread out the peak-hour congestion problems, was initiated in the late 1960s. Curtailment of general aviation from major hubs, slot allocations to airlines by the FAA at some major airports, and discussions about differential pricing of landing fees by time of day were ideas put forward as solutions.

The first example of curtailing general aviation was in 1968 by the port authority at New York's three major airports. The landing fee for general aviation was increased for landing during peak hours, resulting in a 30% decline in traffic at these major airports. A second option for modifying traffic was adopted in 1969 by the FAA to impose hourly quotas on air traffic at five metropolitan airports, including all three in New York. The option of having differential pricing has yet to be adopted by the FAA but was set in place by the BAA (British Airports Authority) in 1971 at congested Heathrow Airport in London England.

By deciding not to build other costs are incurred such as: lost employment and economic opportunities in the construction industry,

94 ibid, p. 231.

95 ibid, p. 231.
staffing of the new facility, and related aviation businesses (i.e. maintenance base, hotels, catering services, car rental, high-tech firms requiring direct connections to global markets). Airport development merits careful analysis of social, economic, and political trade-offs. More rigorous measurements of benefits could offer clear choices for the makers of public policy.
3.8 Conclusions: Lessons Learned from American Experiences.

3.8.1 American Early Aviation 1900-1960.

Section 3.1 documents the fact that from the early 1920s, responsibility for American airport development belonged to the municipalities. They met this challenge successfully for the first four decades of the twentieth century by integrating airport development with, local expertise, business interest and by raising funds through bond markets instead of raising taxes. The U.S. government's contribution to aviation at this time was the construction and maintenance of airways, lighting and navigational aids.

In the late 1940s and 1950s the municipal department and municipal commission airports were experiencing difficulties in commanding the attention of council. Council was faced with the expanding complexities of city management because of the explosive growth of suburban areas. Many of the municipalities adopted the authority structure in order to keep the airports running efficiently, effectively and unburdened by non-aviation matters. An appeal had to be made to the American federal government for financial assistance in upgrading the entire air system (airways & airports) to meet the needs of the new jet technology and passenger growth of the 1960s. The cost of meeting these demands and in purchasing the new technology was on a scale larger than anything seen up until this time.

Section 3.2 presents the main policy actions of the U.S. federal government on aviation issues in the latter half of the twentieth century. In the 1970s, in response to the appeal for funds, the American federal government past the AADA and the AADRA. These were successful policies in raising the necessary capital to ease congestion problems in the airways and in terminals at major airports.

The federal policy of airline deregulation in 1978 basically undid the work of the AADA and the AADRA. Hubbing operations altered the demands on the entire airport system. The post-deregulation era has witnessed a whole new growth in passenger movements and massive airport expansion programs. The federal government promised an equally large expansion in the air traffic control system, using the $5 billion raise through taxes from the AAIA, but have been slow to actually implement this plan. This slow response by the federal government has lead to further congestion problems at the airports and serious safety hazards in the air.

3.8.3 American Airport Management Structures.
Since the 1920s the U.S. has had three choices for airport management, municipal department, municipal commission or the airport authority. The main advantage of the municipal methods (department or commission) of airport management is that airport development is tied directly to Council and the bureaucracy. This enables the Council to coordinate airport management's development interests directly to the City's land use plans, economic strategies, and social concerns (ie. safety & noise). This direct link is also their main disadvantage since it can also delay important decisions and slow airport management's ability to
take advantage of situations that are favorable for airport development. This direct link also requires public funds to guarantee bond issues, which is not always possible if the city has other financial commitments.

There are four main advantages of the airport authority method of airport management. One, it operates as an independent incorporated agency. This allows it the flexibility to have representation of several political divisions on its Board. Two, it is less political in operation, which allows the Board to concentrate on issues that are directly and indirectly a consequence of airport operations and development. Three, the authority can act quickly in implementing decisions due to the low amount of political interference. Four, as an incorporated agency it guarantees its own bond issues, thereby freeing the city's public funds to be used for other projects (ie. hospitals, schools, parks etc).

3.8.4 American Aviation Growth & Technological Change.
American airports used in this thesis have experienced continuous growth in passenger movements for the last six decades. Unlike their Canadian counterparts, the American airport management methods have been more successful in analyzing these growth trends and equipping themselves to meet the demands. The hub-&-spoke systems of the 1980s have required major terminal design modifications and expansion but the American airport managers have successfully responded to this challenge. They will spend over $12 billion over the next ten years to build the necessary terminals and ground facilities to accommodate the growth.
The American airport system's trouble spot is getting the U.S. federal government to spend the $5 Billion AATF funds on necessary airway and runway updates to alleviate air traffic control congestion.

3.8.5 Financing American Airports.
The United States has been using two major approaches to airport financing since the 1920s. The Residual Cost approach airport has the airline assume the largest financial risk. The Compensatory Cost approach airport has the airport operator assume the largest financial risk. These methods have proven to be very successful since in sixty years of financing of airport projects in this manner there has never been a failure of an airport bond. Since deregulation of the airlines in the U.S. several new trends have emerged in airport financing. More airports have had to move away from residual cost approach towards compensatory financing because, fewer airlines want to be directly tied to airport expenditures. Airport management has also diversified their revenue base by constructing more shops, hotels and other non-aviation businesses on airport property to secure funds for airport operations.

This diversification in business activities has been interpreted by the U.S. federal government as a move away from being public utilities to being a commercial enterprise and therefore may have their tax-exempt status removed from their bonds. Such a move by the federal government would seriously damage the airports ability to raise the necessary funds for capital projects. This interference by the federal government in conjunction with their reluctance to spend the AATF funds on navigational projects has seriously jeopardized the airport and airway
3.8.6 Impact of Political Suasion on American Airports.
The American methods of airport management are less influenced by political suasion attributes than their Canadian counterpart. Of the three methods of airport management in the U.S., the one influenced the most by political suasion is the municipal department airport. The ability to reduce the impact of political suasion is at its greatest when the airport is operated by an airport authority. Since the airport authority is an independent agency it is not entangled in the political elements which a departmental or commission airport are because of their direct accountability to the Council.

3.8.7 American Airports: Balancing Community and Airport Goals.
Section 3.7 of this thesis outlines the different development solutions proposed by airport management to their respective communities for approval. In the U.S. the expansion policy used by all three methods of management, was accepted from the 1930s until the 1950s because the airports were remote from residential and other urban land use activities. When the cities finally surrounded the airports during the 1950s and 1960s the conflicts between airport management and community goals became much stronger. A 1970s solution was to build new airports farther away from the city (i.e. Dulles and Dallas/Ft. Worth airports). This proved to be either too expensive or not enough property was available for such a large project in the vicinity of a city. The 1980s proposal has been to modify the users of the major airports and the
diversify the airports use to make it more appealing to a wider membership of the community. This proposal has been successful in the U.S. in the short term, but it does not solve the long term needs of the airport for growth capacity nor the community long terms concerns over safety, and noise.
CHAPTER FOUR: AIRPORT MANAGEMENT IN CANADA BEYOND 1990.

4.0 CONCLUSIONS

Chapters Two and Three yield facts which are useful in determining how Canadian airport management should operate in the future. This chapter objective is to present the success of each of the four management methods in achieving the study's five criteria (see TABLE V). The criteria are used as indicators of management's ability to be effective in managing airports. Due to the non-quantitative nature of most of the information the matrix utilizes a "yes" or "no" measurement of each method of management in achieving the criteria. The evaluation is based on the information presented in Chapters Two and Three.

4.1 METHOD OF MANAGEMENT: AIRPORT AUTHORITY

The airport authority method of management is the only method that successfully achieves all five criteria. Since the 1940s, as proven in Section 3.3, it has gained popularity in the U.S. as a method of management for airports. The authority is structured more like a corporation than a government department. This structure allows for more decisions to be decentralized and results in less time spent waiting for approvals. Airport authorities have successfully implemented national government policies such as the FAA (1946), AADA (1970), AADRA (1970), and the AAIA (1982) in the United States.

The airport authority has also been the most successful in developing airports to meet traffic growth and technological change. This
### TABLE V

**EVALUATION OF AIRPORT MANAGEMENT METHODS**

<table>
<thead>
<tr>
<th>CRITERIA*</th>
<th>ONE</th>
<th>TWO</th>
<th>THREE</th>
<th>FOUR</th>
<th>FIVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>AIRPORT AUTHORITY</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>MUNICIPAL COMMISSION</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>MUNICIPAL DEPARTMENT</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
</tr>
<tr>
<td>FEDERAL MINISTRY</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

*CRITERIA:*

ONE: Implementation of National Aviation Policy.
TWO: Administration of Technological & Aviation Growth.
THREE: Acquisition of Funds.
FOUR: Reduction of Political Sustenance.
FIVE: Balancing of Community and Airport Goals.
management structure uses airline and other aviation expertise to keep up to date on all aviation developments as demonstrated in Sections 3.3 - 3.5.

The airport authority is an independent corporate agency created by State legislation. Once created it operates independently of the state and municipal political organizations with the Board members and Manager being elected in separate elections. This has successfully reduced the influence of political suasion as measured in Section 3.6 of this study.

The authority must operate without benefit of local tax dollars therefore management must ensure the acquisition of funds from other sources. American airport authorities since 1940, through the "Compensatory Approach" use of user fees and bond issues, have successfully acquired the necessary capital to meet their financial needs (see Section 3.5). The Authority's Compensatory Approach to funding has been gaining in popularity since deregulation in 1978 as documented by the Congressional Budget Office study of 1982 discussed in section 3.5 of this thesis. This method requires the authority to take on the larger share of financial risk instead of the airlines.

The airport authority has proven to be successful in balancing management goals and community goals by presenting several options for development. This balance was achieved, as shown in Section 3.7, in Seattle, Washington D.C., and New York City because, with elected representation of airport users and community members on the airport authority's Board a wider range of solutions could be explored that were
authority's Board a wider range of solutions could be explored that were acceptable.

4.2 MANAGEMENT METHOD: MUNICIPAL COMMISSION

A municipal commission as airport management is successful in achieving three of the five criteria. The two criteria that were not successfully achieved were; the reduction of political suasion, and the balancing of community and airport management goals.

Municipal commission airports, such as Los Angeles International (LAX), have successfully implemented national aviation policies for the past sixty years. Airport management at LAX utilized the federal funds from the AADA and the AADRA established in 1970 to expand runways, navigational systems, lounges and gate space. In 1982 some funds were also acquired from the $4.8 billion airport development fund and the $6.3 billion navigational fund provided by the AAIA federal legislation. Through these actions the municipal commission airport has proven that it can participate in achieving federal government policy to provide a well planned system of primary airports to reduce hazardous situations (ie. airway congestion) and congestion delays (ie. terminal capacity).

The airport commission at LAX has successfully persuaded investment in their facility as required, as discussed in Section 3.4. Since the 1960s the municipal commission airport has become less effective on this criteria because of; slow response time of the city bureaucracy on
decisions, a reduction in airlines interested in Residual Cost financing due to deregulation, and the possibility of the tax-free status of the airport revenue bond being eliminated. Although these factors may make it increasingly difficult for the municipal commission airport to acquire the necessary capital when it is needed in the future, further research is required.

The municipal commission airport is not successful in minimizing the influence of political suasion because, even though it operates separately from the municipal bureaucracy, the final decisions are made by the municipal Council. This control by Council requires the airport commission's decisions be subject to time and budget concerns for other issues facing the municipality that are not directly a concern of airport development.

The balancing of community and airport goals is also unsuccessful with a municipal commission because of the lack of representation by; municipal departments, other nearby municipalities, and business interests. The municipal commission airport only has appointed officials from the mayor's recommendation regardless of their knowledge of aviation. The commission, operating independently of the municipal bureaucracy, may be in favour of an airport development decision which may not be acceptable by the municipality. Unless the airport commission is required to consult with the municipal departments before a decision is sent to Council for approval, this decision will meet opposition at Council stage and delays can be expected.
4.3 **MANAGEMENT METHOD: MUNICIPAL DEPARTMENT**

Similar to the municipal commission, the municipal department is successful in achieving three of the five criteria. The two criteria not achieved are the same as the municipal commission; the failure to reduce political suasion on airport decisions, and the failure to balance community and airport management goals. The evidence in this research suggests the failures of the municipal department are even greater in magnitude (Section 3.6 & 3.7) than with the municipal commission airports.

Municipal department airports, such as the four used in this study, have all successfully implemented national aviation policies. All utilized the federal funds provided through the AADA and the AADRA in the 1970s and the AAIA in the 1980s. In particular, Dallas-Ft. Worth benefitted from direct federal intervention to initiate discussions between the cities of Dallas and Fort Worth to develop a single modern airport in the 1970s (Section 3.7).

Municipal department airport's have successfully negotiated the changes in passenger growth and technological advancements at their airports (Section 3.3 & 3.4). The municipal department airports in the top eleven American airports are the most active in planning & building for meeting their demands of the 1990s and early 2000s (Section 3.4).

In the United States the municipal department airport is directly
accountable and responsible to Council. Since the early 1950s the
decision-making process of the municipal airport has not kept pace with
airport and airline development needs since decisions are subject to a
growing number of complex issues facing Council. Direct management by
airport users and aviation business interests is not possible since
airport management is part of the municipal bureaucracy. Successful
fund acquisitions are a result of majority-in-interest clauses held by
airport users and aviation business interests through "Residual Cost"
financing (Section 3.5). Three of the four municipal department
airports in this study use Residual Cost financing to meet their
financial requirements for development.

The municipal department airport fails to reduce the influence of
political suasion because, as part of the bureaucracy, it must compete
with other departments for Council's time to convince them to approve
airport development. This accountability to Council makes the airport
department's actions highly visible but reduces the speed of
implementation of its policies. Every airport issue is weighted by the
politicians with respect to its political impacts and merits as oppose
to the quantitative evidence as to the benefits to the airport.

In the United States the municipal department airports also have a
history of failing to balance airport and community goals. In Chicago,
the surrounding municipalities have taken the Chicago Department of
Aviation to court over aviation development (Section 3.7). In Texas,
the U.S. federal government had to order the municipalities of Dallas
and Ft. Worth into negotiations to determine the location and management structure for one regional airport.

4.4 MANAGEMENT METHOD: FEDERAL MINISTRY (CANADA)

The ministerial method of airport management has failed, particularly since 1940, on all five criteria. The major Canadian airports operated by the federal Ministry of Transport have been unable to execute any of the major national government policies without becoming increasingly dependent on the federal government for funds and direct management. The introduction of federal funding for improvements to meet the ICAO commitments of 1948 (Section 2.1) was the first sign of local airport management's inability to implement federal policy. Subsequently the Department of Transport purchased several airports across Canada in the 1950s and 1960s to manage them.

Many of the federal policies implemented by Parliament, in the thirty years between 1960-1980, had negative impacts on the airports managed by the Ministry of Transport. The Regional Air Carrier Policy (1967) increased the demand for already congested airports, the implementation of the Airport Revolving Fund (1979) eliminated the possibility for revenue generating airports to be self-sufficient, and the liberalization of airlines (1984) created a second wave of demand for airport capacity when the federal ministry was reducing funds on airport expenditures (Section 2.2 & 2.3).

This method of airport management has also failed on several occasions
to effectively accommodate changes in aviation technology and aviation growth. The evidence shows, the major airports in Canada have been caught in a losing cycle of catching up to the advancements (Section 2.4). The recent period of declining or slow growth in passenger traffic (1981-84) has given these airports an opportunity to break this cycle. They now could meet the aviation needs of the newest equipment (ie. 747-400) and integrate commuter airline needs into terminal designs. Unfortunately the federal government is not financially committed to these developments at this time and therefore the major airports are not able to break free of this losing cycle.

Airport management was slow to react to the passenger volume increases of the 1960s and 1970s resulting in congestion problems and under designed terminals. The mega-carriers of the 1980s have added to these congestion problems by creating a monopoly over airport space in some cities thereby making it impossible for other carriers to expand their service at these cities or for new carriers to entry service. Cities that have experienced this situation are witnessing the failure of the intent of other national aviation policy which was to increase competition by removing airline regulation (Section 2.4). These developments compounded with the creation of hub-&-spoke operations, and the lack of response by the ministerial management method, have resulted in even larger unsolved congestion and safety problems at major Canadian airports in the 1980s.

The ministerial method of airport management has a serious fault in how
the major airports secure financing (Section 3.5). Airports compete against each other and with other ministries for limited funds available from the Federal Treasury. In 1988, with a government focused on reducing their debt it becomes increasingly difficult to convince them to spend the necessary funds on airport development for the 1990s and 2000s. The focus of the problem is airport financing is tied directly to the political process of the Federal budgetary and financial planning process. Effective control of implementing any large project is centralized to Ottawa in a political process leaving local airport management unable to plan its future with financial certainty.

Of the four management methods examined in this thesis the ministerial airport management decisions are the least successful in reducing political persuasion (Section 2.6). The conflict between a service oriented government and cost/profit oriented aviation clients (airlines or concessionaires), has often resulted in major delays between meeting aviation demands and government investments. Being part of the federal bureaucracy the constant assessing of airport management decisions for political ramifications has meant changes are slow in developing and management is less effective in dealing with aviation developments.

A lack of meaningful local participation has always been a strong criticism of the ministerial method of airport management in Canada (Section 2.7). This problem has resulted in the Ministry's inability to balance airport and community goals in relation to airport development. Airports are large properties operated outside of local planning
jurisdictions but their spatial influence on residential, commercial, industrial and recreational planning strategies are critical. Although the solutions for airport development are the same as the American examples, the federal government applied them in unilateral moves without input from concerned local interests. A management method which has more direct input by local participants (municipal government, aviation clients) would facilitate better balanced community and airport goals.

4.5 RECOMMENDATIONS

The intent of this thesis was to analyze the Canadian and American approaches to airport management using five variables. As part of this comparison a proposition was also made that to; determine whether management of metropolitan airports in Canada requires a less or more centralized structure in order to be more successful in operating the airports effectively. After reviewing the four methods of management, the American airport authority method, with some modifications, emerged as the most promising method to decentralize airport management and increase their effectiveness as measured by the five variables. Several actions must be taken to establish airport authorities in Canada.

First, the Federal Government in Canada, as the political body responsible for metropolitan airports in Canada, can initiate the necessary legislative changes. Airport authorities should be established as independent incorporated agencies to avoid the political influences which ministerial agencies and crown corporations are subject
to. The legislation would establish the authority with a method of electing members of the Board and the Airport Manager from local residents in separate elections. The separate elections reduces the pressure of political suasion on Board members and the manager because they are not dependent on being appointed by the other.

The legislation to create the new authorities would also require coordination with Provincial land acts and policies since land is under Provincial responsibility as determined by Section 92 of the Constitution. In the past airport operations have been exempted from Provincial zoning acts and land acts because the Federal Government was given the right to operated aviation independently. This is a highly complex legal and constitutional question if the Federal Government decides to actually give over the rights of the property to the new authorities. The issue requires much further research in these areas than is possible in the scope of this thesis but has been noted as a major issue to be address to enable the creation of airport authorities in Canada.

Second, at least one of the positions on the Board should be a local senior bureaucrat from the planning department so that airport development plans are integrated with development plans for the entire vicinity. A senior planner on the Board is advocated, instead of a local politician, because this will provide the Board with a local planning perspective while eliciting operational knowledge of development for the region. A local politician on the Board would
entangle the airport authority in political issues and election cycles which are not a concern of the airport.

Third, it is recommended that legislation be passed by the Canadian federal government requiring the taxes raised on airline tickets, aviation fuels, etc., be firmly committed to airport and airway development. This legislation is necessary to prevent the problems that the American airports are currently faced with in convincing the American federal government to use the $6 Billion AATF funds on updating the airport and airway systems (see Section 3.5).

Fourth, the Canadian federal government should maintain control of setting the standard for air traffic control regulation and airport security as a matter of national security. Safety and security issues are national and international issues which should not be viewed in isolation by individual airports or cities.

Fifth, the new airport authorities must have the power to raise their own funds for operational and capital expenditures. These funds can be raised in the bond markets thereby separating airport development from the dependency on the political cycles of federal budgeting or any other political budgetary processes. The independence in funding gives individual metropolitan airports the ability to plan their financial future with greater certainty. A transitional period of federal guarantees will be required until the new airport authorities can prove to investors that they can effectively operate the airports. After this
initial period of transition the airports should operate similar to Compensatory Cost approach airports in the United States. This approach will reinforce control with the airport authority for development plans and security over financial planning.

Sixth, the Canadian airport authorities must have an effective community relations department to maintain effective communications and consultation with concerned municipalities and other interest groups. It is recognized that not all parties will be satisfied with all decisions by the Canadian airport authorities but this method has more room for improvement of communications over the present ministerial system.

Seventh, the development of separate airport authorities will require training programs for existing personnel and a program to find highly qualified people for areas not currently under local airport management control. Current management is specialized in the political and bureaucratic procedures common to an organization which is part of a federal ministry. These skills are not the ones needed by management for operating independent airport authorities. Greater emphasis will be placed on the skills of; marketing, financing, public relations and cost analysis.

4.6 IMPLICATIONS
The following implications could develop with the five criteria used to
monitor management's effectiveness if airport authorities are established as the method of airport management at metropolitan airports in Canada. First, an airport authority will be able to implement national aviation policies more quickly and accurately because the authority's main directive and interest is concentrated on operating an airport. The airport authority will not be entangled in political issues which are not of direct concern of airport operations.

Second, the administration of technological and passenger growth will be better managed using the airport authority method because of the direct input from the aviation community to the Board and Airport Manager in the development process for the airport. This process also has the local community represented through the position of a senior local planner to ensure coordination of airport development with the community's development strategy. The airport authority method improves the response time to changes in technology or passenger movements because, its localized nature allows it to take action as these changes occur in their own region. Airport management is not required to wait for a centralized governing body to recognize trends and take action on it.

Responses to technological change and passenger growth will vary from one airport to another but that is expected since each city is faced with a different set of economic and social reasons for airport services. The localized nature of airport authorities allows for this flexibility. A fixed standard for safety and security can be set by the
Ministry of Transport for all airport operations thereby ensuring the public with safe operations regardless of the authority's and community's economic interests in airport development.

Third, the acquisition of funds will be much less limited than when under the ministerial system. Airport authorities have proven that there are a large number of investors who are quite willing to invest in airport developments because of the tax-exemption status of airport bonds. This tax-free status is crucial to the success of airport bonds and must be ensured when the federal government legislates the creation of the authorities. Otherwise there is the possibility the airports will not be able to attract the investors they require to supply the necessary funds after the federal government withdraws its funds.

Fourth, the airport authority method is the best method of reducing the high amount of political suasion problems currently plaguing the ministerial airports in Canada. The politicians will have no control over the airport's daily operations or expansion plans. The airports will no longer be subject to fund freezes when there are elections called or when there are Cabinet shuffles. The airports will no longer be subject to cycles of political uncertainty with respect to the direction of airport development because of other political issues which prevent Cabinet from making a budgetary decision in favour of the Ministry of Transport.

Fifth, the airport authority method offers the best method for
integrating community goals into airport development plans. This will be a major breakthrough for the metropolitan Canadian airports. This coordination of airport and community goals will present the opportunity to show how important airports are to their communities, economically as employment centres and socially as a connection to world cultures.

The evidence in this thesis indicates that the airport authority method of management is a better management method for metropolitan airports than the Federal Ministry. The Canadian federal ministerial management method has failed with respect to the five variables identified in this thesis resulting in reduced efficiency, large additions to the public deficit and dissatisfaction by the travelling public and aviation business community. The adoption of the airport authority method will require major organizational changes, but it appears to be the most sensible choice in the framework of this analysis.
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### Table 1

<table>
<thead>
<tr>
<th>CITY OR AIRPORT</th>
<th>SIZE OF CITY# (acres)</th>
<th>SIZE OF AIRPORT (acres)</th>
<th>AIRPORT SIZE as a % of city size</th>
<th>DISTANCE to City Centre</th>
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<td></td>
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<td>4,900</td>
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<td>26 &quot; NE</td>
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<td>Vancouver</td>
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<td>National</td>
<td>&quot;</td>
<td>680</td>
<td>1.7</td>
<td>3 &quot; S</td>
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(Notes on following page)
## APPENDIX 1
### NOTES TO TABLE 1

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<thead>
<tr>
<th>SYMBOL</th>
<th>NOTE</th>
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<tr>
<td>*</td>
<td>Metropolitan area of Calgary includes large rural land tracts.</td>
</tr>
<tr>
<td>′</td>
<td>Acreage represents the size of the City of Montreal.</td>
</tr>
<tr>
<td>′′</td>
<td>Acreage represents the Metropolitan area of Toronto.</td>
</tr>
<tr>
<td>†</td>
<td>Acreage represents the Metropolitan area of Los Angeles.</td>
</tr>
<tr>
<td>††</td>
<td>Acreage represents the Metropolitan area of New York City.</td>
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<tr>
<td>**</td>
<td>Acreage and distance figures refer to Edmonton International Airport.</td>
</tr>
<tr>
<td>++</td>
<td>Acreage refers to the District of Columbia Metropolitan area.</td>
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</table>
APPENDIX 1

TABLE 2

AIRCRAFT STATISTICS
(By Decade)

<table>
<thead>
<tr>
<th>YEAR BUILT</th>
<th>AIRCRAFT TYPE</th>
<th>PASSENGER CAPACITY</th>
<th>SPEED (mph)/ RANGE (mi)</th>
<th>MAX T.O. WEIGHT (lbs)</th>
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<tr>
<td>1926</td>
<td>Trimotor</td>
<td>22</td>
<td>128/700</td>
<td>12,500</td>
</tr>
<tr>
<td>1935</td>
<td>DC-3</td>
<td>36</td>
<td>194/1510</td>
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<td>1937</td>
<td>BEECH-CRAFT 18</td>
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<td>209/1530</td>
<td>9,900</td>
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<td>DC-4</td>
<td>86</td>
<td>204/2140</td>
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<tr>
<td>1946</td>
<td>DC-6</td>
<td>108</td>
<td>265/3005</td>
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<tr>
<td>1947</td>
<td>CONVAIR-240</td>
<td>52</td>
<td>289/1300</td>
<td>49,100</td>
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<td>1950</td>
<td>VICKERS-700</td>
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<td>312/1750</td>
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</tr>
<tr>
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<td>DC-7</td>
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<td>274/4100</td>
<td>143,000</td>
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<tr>
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<td>FK F27</td>
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</table>

### APPENDIX 1

**TABLE 2 (contd)**

**STATISTICS OF MAJOR COMMERCIAL AIRCRAFTS**  
(By Decade)

<table>
<thead>
<tr>
<th>YEAR BUILT</th>
<th>AIRCRAFT TYPE</th>
<th>PASSENGER CAPACITY</th>
<th>SPEED (mph)/ RANGE (mi)</th>
<th>MAX T.O. WEIGHT (lbs)</th>
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<td>599/2880</td>
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### APPENDIX 1

#### TABLE 2 (contd)

**STATISTICS OF MAJOR COMMERCIAL AIRCRAFTS**  
(By Decade)

<table>
<thead>
<tr>
<th>YEAR BUILT</th>
<th>AIRCRAFT TYPE</th>
<th>PASSENGER CAPACITY</th>
<th>SPEED (mph)/ RANGE (mi)</th>
<th>MAX T.O. WEIGHT (lbs)</th>
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<td>DC-10-30ER</td>
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<td>DC-10-15</td>
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<td>149</td>
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<td>500/2222</td>
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<td>MD-11</td>
<td>405</td>
<td>623/7830</td>
<td>575,000</td>
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FIGURE 1
PERSONS YEARS AS A PERCENTAGE OF ANNUAL TRANSPORT PROGRAM RESOURCES 1985-86

- ACC INVST 1.2%
- SAFETY 9.0%
- ECO RGLTN 2.5%
- OTHER 2.4%
- RESEARCH 0.7%
- H/B/L/D 0.5%
- WATER 0.1%
- RWY FREIGHT 0.2%
- GRAIN 0.2%
- RAIL PAX 0.2%
- PORTS 0.5%
- AIR OPTNS 53.4%
- COAST GRD 29.2%
FIGURE 2
NET COSTS AS A PERCENTAGE
OF ANNUAL
TRANSPORT PROGRAM RESOURCES
1985-86
FIGURE 3
APPROVAL-IN-PRINCIPLE PROCESS

Problem/Opportunity/Idea

Need for Approval-in-Principle Document

NO

YES

Preparation of APD

Administration Approval > $3M*

DM/DMX Approval

Capital Program ≤ $3M

* $1M for Departmental Administration Groups
≤ less than or equal to
> greater than

** Subject to the allocation and availability of funds

Total Deplaned Plus Enplaned Passengers on Scheduled Services at Major Canadian Airports, 1984

Nombre total de passagers débarqués et embarqués sur des services à horaire fixe aux principaux aéroports canadiens, 1984

Source: Department of Transport, 1984
Produced by the Geographical Sub-Division, Statistics Canada, 1986
APPENDIX 1.


The Canadian Air Transportation Administration 1978

App. 1

Appendix 1

Organizational Chart 1

The Canadian Air Transportation Administration 1978

Deputy Minister

Administrator Air Administration

- - - - - - - - - - - - -

Deputy Administrator

Director Personnel

Director General Policy & Planning

Director General Finance

Director General Operations Review

Director General Airports & Construction

Director General Civil

Regional Administrator(s)

Region Manager Personnel

Region Manager Planning

Region Manager Finance

Airport (Note 1)

Region Manager Airports & Properties

Region Manager Construction Services

Region Manager Telecommunications

Region Mgr Air Traffic Services

Region Administrative Services

Airport (Note 2)

Manager Airport Operations

Airport (Note 3)

NOTE 1 PRINCIPAL AIRPORTS
Managers report to Regional Administrator:

Toronto/Dorval/Mirabel

NOTE 2 PRINCIPAL AIRPORTS
Managers report to Region Manager of Airports & Properties Branch:

Vancouver/Calgary/Edmonton Intl
Winnipeg/Ottawa/Halifax/Gander

NOTE 3 PRINCIPAL AIRPORTS
Managers report to Manager of Airport Operations:

Victoria/Regina/Saskatoon/Thunder Bay/London/Windsor/Quebec/
Charlottetown/Fredericton/Moncton
Saint John/Sydney/St. John's

APPENDIX 2
DIAGRAM 1
AIRLINE ROUTE STRUCTURES

Airline Route Structure Pre-1978
* Linear Network – Direct, non-stop flights between most cities.

ADVANTAGES
* Direct flights for passenger
* Shortest flying time
* All airports experience growth in traffic

DISADVANTAGES
* Economically inefficient for airline operations – ie. where density is low on some routes
* Airlines need more equipment & crew to keep all routes in operation

Airline Route Structure Post-1978
* Hub & Spoke Structure first used in the deregulated U.S. domestic market.

ADVANTAGES
* Economies of Density working for the airlines – become more efficient use of equipment and crew
* more efficient airline may mean lower fares
* may open up possibilities for other airports in system to attract new traffic by freeing up time slots for landing

DISADVANTAGES
* Passengers now must change planes
* Connecting time adds to journey
* in example, CAL airport has a larger increase in traffic in comparison to others in system
* CAL airport quickly congested during peak hours to process "hubbing" flights
CANADA AIRPORTS — EAST

Enplaned & Deplaned Passenger Volumes 1964 – 1980

GRAPH 1


Source: Aviation Statistics Centre, DBS-51-203 & 51-005, Ottawa.

CANADA AIRPORTS — EAST


GRAPH 2


Source: Aviation Statistics Centre, DBS-51-005 Table 3, 1985.
Canada Airports - West
Enplaned & Deplaned Passenger Volumes 1964 - 1980

Graph 3

Source: Aviation Statistics Centre, DBS 51-203 & 51-005.

Canada Airports - West
Enplaned & Deplaned Passenger Volumes 1981 - 1984

Graph 4

Source: Aviation Statistics Centre, DBS-51-005, Table 3, 1985.
CANADA AIRPORTS – EAST

Total Civil Aircraft Movements 1964 –1980

GRAPH 5

CANADA AIRPORTS – EAST

Total Civil Aircraft Movements 1981 – 1984

GRAPH 6

Source: Aviation Statistics Centre, TP 577, Table 3, 1968–84
CANADA AIRPORTS – WEST

Total Civil Aircraft Movements 1964 – 1980

GRAPH 7

CANADA AIRPORTS – WEST

Total Civil Aircraft Movements 1981 – 1984

GRAPH 8

Source: Aviation Statistics Centre, DBS 51-005, Table 3, 1985.
APPENDIX 2
ORGANIZATIONAL CHART 2
Port Authority of New York & New Jersey

SOURCE: Smith Donald et. al, Airport Planning and Management, 1984, p. 135.
(Effective December 8 1982)
U.S. AIRPORTS — EAST
Enplaned & Deplaned Passenger Volumes 1950 - 1980

GRAPH 1

Source: FAA Statistical Handbook of Aviation, 1961 & 1965,

U.S. AIRPORTS — EAST
Enplaned & Deplaned Passenger Volumes 1981 - 1984

GRAPH 2

U.S. AIRPORTS – WEST
Enplaned & Deplaned Passenger Volumes 1950 – 1980

GRAPH 3

U.S. AIRPORTS – WEST

GRAPH 4

Source: FAA Statistical Handbook of Aviation, 1950 – 1965,
Stroud J., Airports of the World, 1980
U.S. AIRPORTS - EAST
Aircraft Movements By Airport 1950 - 1980

GRAPH 5

U.S. AIRPORTS - EAST
Aircraft Movements By Airport 1981 - 1984

GRAPH 6

U.S. AIRPORTS – WEST
Aircraft Movements By Airport 1950 –1980

GRAPH 7

U.S. AIRPORTS – WEST
Aircraft Movements By Airport 1981 – 1984

GRAPH 8

APPENDIX 3: DEFINITIONS

APPROVAL-IN-PRINCIPLE - formal presentation of proposals to the appropriate level of management to seek the authority to proceed with the detailed analysis required to develop a specific solution to a problem or opportunity.

CAPITAL PROJECT - refers to the acquisition of an asset (e.g. buildings, roads, works, machinery, furnishings and equipment) and any major alterations or modifications to an asset which improve performance or capability. The term does not include the normal repair and maintenance of an asset.

CONSTANT DOLLARS - dollars tied to a stated base year (i.e. excludes inflations).

COST OVERRUN APPROVAL - must be sought from the appropriate approval authority when there is an expected or actual increase in the cost of a project following effective project approval. This increase may either be over the estimated cost to which approval was given (total overrun) or where a project has already incurred approved overruns, over any subsequent approved cost (current overrun). An increase in total estimated project costs resulting from the development of successively more reliable estimates prior to effective project approval will not be considered a cost overrun.

CURRENT DOLLARS - dollars of the fiscal year in which expenditures will be made; they are also called budget year dollars (i.e. includes inflations).

DECISION DOCUMENTS

APD - refers to the document through which management approval is sought prior to proceeding with the detailed analysis required to develop a specific solution to a problem or opportunity.

PAD - refers to the document through which preliminary or effective project approval is sought for those projects having a TEC within the Department's delegated authority - i.e., in Administration a PAD will be used when the TEC falls within the range of $250K to $1M (inclusive). In AIR a PAD will be used when the TEC falls within the range of $250K for projects under $250K. Note that it is expected that preliminary project approval for projects within the Department's delegated authority will be rarely required.

TBS - refers to the document through which preliminary or effective project approval is sought for projects having a TEC requiring Treasury Board approval. In AIR a TBS will be used when the TEC is greater than $3M.
DIRECTIVE - a statement indicating the mandatory features of a policy. Prior approval must be obtained for non-compliance with directives.

EFFECTIVE PROJECT APPROVAL - is the point at which a specific budget for a project is established and specific authority is given for the responsible manager to proceed with, subject to the allocation and availability of funds, the physical execution of the project (e.g. detail design, production/construction and commissioning), based on reliable and up-to-date cost estimates (at least Class B). This authority level is a reference point for monitoring the overall program and against which a project and its management will be evaluated.

GUIDELINE - a statement indicating an instruction which, while not mandatory, should be followed unless there is good reason not to do so. Non-compliance does not require prior approval.

MULTI-YEAR OPERATIONAL PLAN (MYOP) - encompasses the development of program plans and the detailed assignment of resources to carry out approved policies and programs over a three-year forward period. The MYOP is designed to elicit, among other things, the detailed forecasts of expenditure and person-year requirements over a three-year period.

PRELIMINARY PROJECT APPROVAL - represents authority to spend only those project funds that are necessary to develop Class B estimates for a project. Physical execution of the project may commence under this authority, e.g. detail design, land acquisition and project management funds.

PROGRAMMING - is the determination of the optimum means of achieving corporate short and long-term goals, the assignment of funding priorities and the development of the total Transport Program within the limits of projected resource availability.

PROJECT - an approved aggregate package of activities specifically dedicated to fulfill a program requirement, and having a defined set of objectives including performance and cost over a prescribed period.

TOTAL ESTIMATED COST (TEC) - is the total estimated capital expenditure (stated in both constant and current dollars) to be incurred over time for all aspects of a project. It includes such items as site acquisition and preparation, acquisition fees, design, legal fees, material, supplies, services, contingencies, capital person-year costs and, where applicable, post project evaluation costs.