UNIVERSITY OF
CALGARY

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A Demonstration Project: Mission Synergy Centre

The University of Calgary

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James Q. Mazak

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Key Words: digital telecommunications, synergy centre, teleport, urban intervention, quasi-public space and redevelopment

Abstract

The infrastructure of "the information age" is digital telecommunications, which has the potential to have the greatest impact on where people, live, work, recreate, and learn.

This study provides planners with a general overview of digital telecommunications and its applications through telecommunications initiatives. As a demonstration, the former St. Mary's School site was identified and selected as a possible location of a synergy centre within the Community of Mission. The proposed synergy centre is a quasi-public space that would fulfill the role of enabling the residents to live, work, play, and learn within their community.

The intent of developing and integrating a synergy centre within the Community of Mission was also to demonstrate that digital telecommunications can transform and reinforce spaces and places at the residential community scale. The synergy centre concept was envisioned to address both the dynamic natures of residential communities and the urban planning documents and policies that are influencing the urban fabric in Calgary.

The proposed synergy centre will:

- Enable and facilitate the development of telecommuting and home based businesses;
- Reduce some of the social and economic barriers to experiencing and accessing the Internet;
- Present a possible solution to inner city a school closure; and
- Provide a synergistic and professional environment for growth within an inner city residential community.

In conclusion, there are many possible opportunities and mutual benefits of integrating digital telecommunications in residential communities for community purposes. Planners are very well posed to undertake this integration task by facilitating partnerships with telecommunication providers, municipal authorities, and other community interests. As well, planners should consider the adoption and integration of digital telecommunications initiatives as part of community redevelopment strategies.

Table of Contents

Chapter 3 - Telecommunications Initiatives

Chapter 4 - Mission Community Profile

Chapter 5 - Calgary Planning Documents

Chapter 6 - Proposed Mission Synergy Centre

Chapter 7-Conclusion

Appendixes

List of Tables

List of Figures

Chapter 1 - Introduction

1.0 Background

1.1 Enabling Infrastructure - Digital Telecommunications

Communities around the globe are being revitalized and redefined through the adoption and integration of what has been termed the "enabling infrastructure." This enabling infrastructure is digital telecommunications. It is also widely accepted that our economy will largely be based on new information and digital telecommunications technologies which have the potential to create shifts in the patterns of employment, commercial, and residential areas within a community, city, region, and nation. If people work, consume, and recreate differently, the way in which they relate to their built environment will also change, and may result in new urban forms, a new function for vacant buildings and open space, and possibly alterations to the urban and rural landscapes. "New telecommunications technologies do not just impact upon places; places and social processes and social relationships they embody also affect how such technological systems are designed, implemented and used (Gillespie & Robins, 1989)."

The significance of telecommunications is evident through the development of telecommunications initiatives by municipalities and planners around the world. These initiatives are fueled by new public and private partnerships with economic development and business development intentions. Some municipalities have gone as far as to secure high-speed digital networks in order to attract new technology based businesses with the intentions of sustaining quality of life of residents.

In North America deregulation of the telecommunications industry began in the mid-1980s and since then various theories and models relating to the form and function of municipalities have been advanced in planning and telecommunications. These theories and models include the development of nation states (global cities), techno-burbs, telepolis, and the decentralization and centralization of metropolitan areas. They were developed in an attempt to better understand and explain how urban environments are evolving, as well as to examine some of the implications and applications of digital telecommunications might have on the urban environment. Today's evidence of technoburbs and backward-linked offices demonstrate that metropolitan areas are able to centralize and decentralize activities through the use of digital telecommunications.

At the other end of the spectrum, some theories and models proposed suggest that digital telecommunications would be the demise of metropolitan areas and people would be able to work and live anywhere, thus making place and space irrelevant. Fortunately, both places and spaces are as important and relevant as ever in history of the development of wire and wireless telecommunications networks.

The trend towards portable computing demands sophisticated networks that are typically found in large metropolitan centres. The most sophisticated wire and wireless networks are centralized within urban environments and tend to reinforce a centralized computing system. Businesses and individuals increasingly demand more bandwidth than what is currently available over existing wireless networks and rely on higher bandwidth services readily offered over wire networks. Some businesses and individuals are able to remain competitive and cost effective utilizing the current wireless network and do not require more bandwidth. There are also an increasing number of businesses who have developed new business models based on both wire and wireless networks in support and delivery of their products and services. It is these businesses that are creating a demand for convergence of wire and wireless capabilities. Capabilities and capacities of all networks will continue to evolve with demand. This demand will likely continue to be the greatest in the largest metropolitan areas as demonstrated by the development of telecommunications initiatives, such as teleports.

Telecommunications initiatives have contributed to changes in urban environments around the world. As a result of deregulation, competition has inadvertently fuelled a dynamic and vibrant activity of adoption and integration of digital telecommunications through public and private partnerships. The contributions of these partnerships have developed specialized and unique telecommunications initiatives, such as teleports.

1.2 What is a Synergy Centre (Teleport)?

The teleport concept originated in New York City, during the early 1980s when the city was experiencing economic decline. Under an alliance between New York City, the Port Authority, Merrill Lynch and Western Union, the development of a teleport provided businesses direct access to advanced telecommunications infrastructure, thus attracting new firms to the area and retaining firms that otherwise might have moved out of the city (Williams, 1991).

By definition a teleport is a type of global telecommunications facility that provides its users with fast, convenient access to advanced telecommunications using satellites, fiber optics, microwaves, and other networks (World Teleport Association,

Figure 2: Washington Teleport

1995). They are a phenomenon being created around the world in both developing and developed countries allowing for advanced global telecommunications. Teleports are attractive facilities for information intensive businesses, governments, and municipalities, since they can transmit and receive information in an affordable, efficient, and quick manner. Furthermore, teleports also allow for smaller and less frequent users to share the costs of having access to advanced telecommunications infrastructure in order to compete on a global basis. The integration of teleports at the community scale is a relatively new concept with the exception of the Neighborhood Office Network in Ile-de-France.

Figure 3: Paris Teleport

According to the World Teleport Association teleports have a flexible form, which are represented by four different typologies: Telecom Port, Real Estate Teleport, Intelligent City, and the Virtual Teleport. Essentially, all of these typologies are similar in that they are all advanced telecommunications hubs serving both public and private interests. The differences between them are the degree of organization and the amount of investment required, as the projects vary in complexity and size. The simplest being the Telecom Port is a facility that can transmit and receive data. The Real Estate Teleport adds the real estate, similar to an industrial/research park. An Intelligent City is an advanced telecommunications town built within the central business district of a major urban agglomeration. The final typology is the Virtual Teleport, which is associated with communities that have existing advanced telecommunications infrastructure where its capabilities make it virtually a teleport.

Figure 4: Pussan Teleport

Table 1: Teleport Typologies

Typology	Description
Telecom-Port	A telecommunications hub providing service for profit, independent or carrier-owned, an "airport" for information, providing shared use of complex and costly facilities.
Real Estate Teleport	Adds "intelligent," fully -networked commercial real estate to "telecom-port," developed by public/private partnerships, and provides value-added services to tenants.
Intelligent City	New teleport-based city centre requiring urban redevelopment with advanced communications and information services to businesses, governments, and institutions on-site and off.
Virtual Teleport	For infrastructure-rich communities with no need for new networks or business parks, allows for one-stop-shopping gateway to existing networks, satellite communications and services, and requires a co-operative venture among business, non-profits, and governments.

Source: World Teleport Association, 1995.

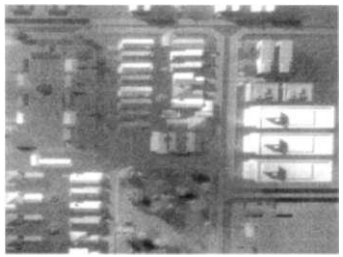

Figure 5: Virtual Teleport

A business centre and technology centre/synergy centre are both different and similar. A business centre may or may not provide high-speed telecommunications access, however a synergy centre does provide high-speed access. A business centre may be focused on incubation and/or research development, however a synergy centre provides new opportunities through innovation and technology. A business centre is typically focused on tenants and organizations, however a synergy is

both a place and a space for individuals and organizations. Both business centres and synergy centres provide economies of scale of shared space and services to its users. Both business centres and synergy centres are physical in a building sense.

For the purpose of this study, the term "synergy centre" stems from the combination of the definitions derived from its own composition. Synergy meaning, "the interaction of two or more agents or forces so that their combined effect is greater than the sum of their individual effects (The American Heritage Dictionary of the English Language, 1996)." Centre meaning, "a place where some particular activity is concentrated (WordNet 1.6,1997)." Therefore the definition of a synergy centre could mean a place where the interaction of two or more agents or forces so that the combined effect is greater than the sum of their individual effects or activity are concentrated. More specifically this study proposes that a synergy centre is a unique quasi-public space or place that would fulfill the role of enabling the residents to live, work, play, and learn within their community through digital telecommunications.

1.3 Teleworking is on the Rise

At the international level, firms are utilizing the Internet to hire and retain workers who work remotely. Pham (2000) reports that the Internet has created a world without geographic boundaries which allows international workers to get well-paying jobs without having to relocate, while host countries such as the United States do not have to physically accommodate these workers. It is suggested by Pham (2000) that corporate spending on outsourcing services in the United States is estimated to grow from $51 billion in 1998 to $81 billion in 2003 and a significant portion of that money will likely go toward hiring technical talent outside the United States. It is also suggested that the sheer volume of workers needed, combined with the requirement for physical collaboration on the most complex projects, means many jobs can not be farmed out remotely (Pham, 2000).

In Canada, Statistics Canada reported, that the number of teleworkers has reached one million (in 2000) and should climb to 1.5 million by 2001. According to the Statistics Canada's Workplace and Employee Survey (1998) there are three dominant types of teleworkers: those who do overtime work at home, those who work some normally scheduled hours at home (predominantly one to two days a week or less than 40 percent of their hours worked), and those who do not have an external office and do all their work from home. The survey also indicated that half of all home-based workers were provided with equipment to support their work: 22 percent received a computer, 14 percent a modem, and 11 percent a fax machine.

In an unrelated report, The Information Highway and Canadian Communications Household Study published by Ekos Research Associates Inc. the underlying attitudes and behavior within Canadian households relating to the Information Highway was explored. Overall, the study found that some of the more important impacts of the Information Highway relate to the nature of work and its reported relationship to both family and home life, as noted below:

- The study pointed out that while most people still work from what is considered to be a traditional workplace, there was a general acceptance to the concept of working from home. Apparently, many of the people surveyed indicated that they expect to work from the home in the future.
- The study also found four in ten Canadians who currently work for an employer indicated that they would switch jobs if another employer offered them an equivalent job in terms of pay and responsibilities, but that the new job allowed them to telework (Graves, 1998).
- One in four Canadians who work for an employer reported that their company has either a formal or informal arrangement where some employees can do some of their work from home (Graves, 1998).
- Despite all the cautionary statements regarding teleworking, there is a general sense that the positive impacts from working from home far outweigh the negative impacts. Currently, those who are working from home are considerably positive about their own experience, particularly in relation to finances, family life, time pressures and working hours.

In the City of Calgary, teleworking is recognized and supported by the City's Corporate Effectiveness Committee, which has approved the development of a telework policy and implementation strategy for its municipal employees (Escape the rush, City of Calgary, 2000). Within this policy, the City of Calgary also recognizes the importance of land use planning strategies and supports that jobs and housing should be located in closer proximity to one another in an effort to reduce the impacts of peak hour travel and influence travel patterns. Housing needs to be built at higher densities to reduce travel distances and maximize transit effectiveness. As well, the City also suggests that decentralized and concentrated employment nodes be required to promote a more dispersed travel pattern.

In The City of Calgary Civic Census Travel to Work Surveys, conducted in 1996 and 1999, the number of telecommuter jobs increased from 1,900 (1996) to 2,900 (1999), an increase of 1,000 telecommuter jobs. According to The City of Calgary Civic Census Travel to Work Surveys a telecommuter is defined as "a person, employed outside the home, but working at home some days." This definition does not include checking email or accessing the company intranet and as a result the number of telecommuters is significantly lower than the results provided by Statistics Canada. During this 3-year period the rate of

growth is noteworthy, since it shows that telecommuting grew by 53.6% despite that the 1,100-telecommuter jobs represents only 0.6% of the total workforce in Calgary. The reasons for this growth may be attributed to company telecommuting policies, municipal planning policies, general acceptance of telecommuting, and possibly the definition of telecommuting..

The rate of growth of telecommuting activity is assumed to be related to the improvements in office technologies and digital telecommunications. During this 3-year period there were significant improvements in technology and its affordability. It is anticipated that the rate of growth of telecommuting will be maintained if we continue to experience significant improvements in one or more of the factors making telecommuting more attractive for both employers and employees. It is anticipated that improvements and affordability of office technologies and digital telecommunications could eventually reach a threshold where it has a perceived impact on the pattern and distribution of employment within a municipality.

It is advantageous for companies to consider telecommuters when it represents a good alternative to traveling long distances, reduces the need for relocations and absenteeism, reduces the company overhead for leased or owned real estate, and when viewed as a strategic way to recruit or to hold on to valuable employees. Companies also need to recognize the importance of having a physical office space for the remaining employees that have job descriptions which are not conducive to telecommuting, to provide a meeting place for employees and clients, and co-location of company network and administration services that demand face-to-face contact. However, it is possible that the traditional office space will evolve to provide for an increasing number of different working environments facilitated by company infrastructure.

1.4 Small Office Home Office (SOHO) Development

Statistics Canada reported in 2000 that there are approximately three million Canadians, who own and operate a small office or home office (SOHO), from their private residence. A SOHO is not the same as a telecommuter who is an employee of an employer located outside of the home and connects to their company Intranet or Internet to work.

At the time of this study the composition and dependency upon computing and telecommunications of SOHO operators could not be confirmed. It is however, anticipated that the growth of SOHOs will increase over the next several years as a result of the flux of semi-retired baby boomers seeking casual employment and contract work, as well as the number of employment opportunities become available via the Internet.

In the City of Calgary, "home occupations" are considered small-scale businesses (SOHOs) that are operated out of a home in a residential neighborhood. Two types of home occupations are allowed in The City of Calgary. The first type is a Class I Home Occupation, which has no effect on the surrounding neighborhood. This type is allowed in aii residential neighborhoods. The second type is a Class II home occupation, which has minimal effect on the surrounding, neighbors. This type is allowed only if no adverse impact on the neighbors can be guaranteed.

In 1999, only 5.0% of the Calgary workforce worked from home. The number of home occupations increased from 22,800 (1996) to 23,000 (1999), an increase of only 200 occupations (The City of Calgary Civic Census Travel to Work Survey, 1996 & 1999). The rate of growth is not significant during this 3-year period and there may be a number of reasons and exceptions that attribute to this limited growth in SOHO development in Calgary. Some possible exceptions may be related to the requirements of the Calgary Land Use Bylaw, development restrictive covenants and caveats, and other factors such as landlords, neighbors, physical size of the residential dwelling, awareness, and Digital Divide.

1.5 The Digital Divide

The Digital Divide is a relatively new phenomenon that is associated with the delivery and accessibility of digital telecommunications. The extent or the impact of the Digital Divide is typically measured or assessed through surveys and opinion polls. Although the Digital Divide appears to exist, it is truly difficult to evaluate whether or not it is a real issue. However, municipalities seem to be very active in attempting to reduce the extent or impact of the perceived Digital Divide within their communities.

According to research from Cyber Dialogue (1999), the Internet audience in the United States is growing significantly slower than in previous years. The finding is based on random in-depth interviews with a sample population of only 1,000 Internet users and 1,000 non-users. Cyber Dialogue suggests that the decline in the United States Internet audience growth is not merely a seasonal aberration, but rather, the result of a series of constraints. The most persistent barrier is the so-called demographic "digital divide" between consumers who can afford PCs and online access and those who cannot. Other barriers identified were specific to the non-user segment, which is estimated to represent about one-third of all United States adults, who simply believe they have no need for the Internet.

A survey compiled by the University of Massachusetts of 1,600 residents of inner-city communities indicates that there is a high interest in using the Internet, but adoption of the Internet is curbed by a lack of familiarity with this technology, high cost of equipment, and access (Piasencia, 2001). While the survey findings suggest that income levels help define the digital dividing line, computer access alone does not bridge the technology gap — helping individuals and families to become more comfortable with the technology and navigating the Internet also plays a major role (Piasencia, 20001).

In a separate survey, Taylor (2000) reports that a recent U.S. Commerce Department study suggests that degree-bearing graduates are 8 times as likely to have a computer at home and 16 times as likely to access the Internet from home as those with lower levels of education. Given the education link to adoption of technology, Taylor believes that one possible solution to reducing the Digital Divide is to encourage more college education.

Some municipalities appear to be taking an active role in governing digital telecommunications through incentives and partnerships, while others are developing their own community-based telecommunication infrastructures. Private industry appears to be approaching the Digital Divide more cautiously and base their expansions and upgrades on pure economics. As a result, the delivery of high-speed digital telecommunications is not occurring fast enough for some communities who fear that they will be left out or behind. It is also suggested that any discrepancy in the availability of high-speed digital telecommunications is a function of a capitalist market where people who are wealthier and live in large metropolitan areas tend to have access to better technology and infrastructure (Wilde, 2000).

It is anticipated that communities who leave the private sector out of the telecommunications equation will eventually end up without the fruits of competition four years down the line when there are still no competitors and the municipality decides to give up on their telecommunications initiative (Wilde, 2000). However, over 200 state and local governments in the United States have chosen to operate municipally based telecommunications businesses of one form or another, with over 100 providing cable television service and others offering everything from Internet access to local telephone service (Eisenach, 2001). For example, in 1999 the municipality of LaGrange, Georgia, in partnership with a private telecommunications provider, presented every household with the option of free high-speed digital access to the Internet. The municipal authorities believed that by providing free access to the Internet that people would hook-up to the Internet, since 91 percent already had cable access, however only half of all the residents in LaGrange were hooked-up to the Internet at the end of the year 2000 (Taylor, 2000).

1.6 School Closures

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This trend is largely a result of a higher percentage of family households who tend to be located in new suburban areas rather than established inner city areas of a municipality. As a result, inner city schools are becoming under-utilized, while suburban schools are experiencing a significant amount of growth and demand. There is an imbalance to the distribution of where children live relative to where the schools are located.

In 2000, the Calgary Board of Education identified 35 schools in its system of 204 schools, which have stagnant or declining enrolments. Under the Alberta Utilization Rate, a formula used to calculate funding for schools based on classroom space, these 35 schools were identified for consolidation or closing. It is the responsibility of the Calgary Board of Education to find solutions to maintain high enrolments in order to qualify for more capital funding to build new schools. The bottom line is that the Calgary Board of Education needs to raise its utilization rates by at least 10 per cent to qualify for this funding.

Many of the schools identified by the Calgary Board of Education have space used by other groups such as day-care centres and private schools, or are used by special education projects that require a smaller pupil-teacher ratio. Unfortunately, these types of uses reduce the utilization rate, since the space utilized by these other groups is included in the utilization rate calculation, but is not considered as occupied space under the provincial criteria for calculating utilization rates. Many of the school sites identified by the Calgary Board of Education are also strategically located within communities and typically have good access and parking availability. In some cases these schools have sufficient area to accommodate more than one use on site or within the building. For reasons of location and availability of space these school sites appear to have potential to be used for other purposes during the evenings or weekends and/or redeveloped as a possible synergy centre.

In the United States, shared space within community schools is a national trend that is anticipated to have continued growth over the next five years (Engineering News-Record, 2000). The concept is that these new community schools open earlier, close later and do not shut down on weekends. The buildings tend to have larger auditoriums and meeting rooms and enhanced recreational facilities such as fitness centers, swimming pools and larger gymnasiums open to the general public when the facilities are not occupied for school events or purposes.

2.0 The Study: Mission Synergy Centre - A Demonstration Project

2.1 Problem Definition

The infrastructure is digital telecommunications, which has the potential to influence where people, live, work, recreate, and learn.

In this study, Calgary was chosen because it is considered to be Canada's largest and most successful high-technology incubator. Calgary is also considered one of the most wired centres in North America with a fully digital fiber telecommunications network (Alberta Market Facts Directory, 2000). As well, "Calgary also benefits from having the most well-educated population of any Canadian city and appears to have the highest adoption level of technology in Canada, (Alberta Market Facts Directory, 2000)." These factors make Calgary a desirable location to consider the development of a synergy centre.

Within the City of Calgary, the Community of Mission was selected for its desirable location and good access to public transit, downtown core, and local amenities. Mission is an inner city residential community in transition faced with redevelopment pressures and its community profile characteristics suggest that it maybe capable of supporting a synergy centre. The community is in transition and its demands and characteristics continue to evolve. This study assumes that sensitive intensification will promote more compact dwelling units and fewer large dwelling units having adequate space to accommodate telecommuting initiatives, such as teleworking and SOHOs independent of affordability. If this statement holds true in Calgary, then areas of the city undergoing redevelopment could lose existing telecommuting and SOHO space within residential dwellings.

The drafting of the Mission Area Redevelopment Plan does not consider the positive impact that digital telecommunications could bring to the community. Moreover, how digital telecommunications could be utilized or integrated as a means to enhance and revitalize the Community of Mission.

The City has the opportunity to acquire the former St. Mary's School for the benefit of the community. For the purposes of this study, a synergy centre could be developed within the former St. Mary's School. It could be a quasi-public facility that provides for a variety of uses, based on the community's criteria and lifecycle process. Within the synergy centre education

purposes could be given the highest priority over all other uses in order to maintain adequate space for education. The remaining space could be leased or rented to other users and the community over a 24-hour period.

The synergy centre could also allow communities to deliver and provide for services that are of a public interest, while making the best and most efficient and effective use of community resources. Therefore, the synergy centre is a possible solution to managing and balancing public infrastructure and resources for education and public purposes.

As planners we should begin looking for alternatives to allow all areas of the municipality to develop spaces and places for high-speed digital telecommunications to ensure that all residents at minimum have access to high-speed digital telecommunications. Regardless of whether you are located in an old or new community this alternative space or place could take the form of a synergy centre.

2.2 Study Purpose

For this study, the proposed synergy centre is based on the Neighbourhood Office Network (teleport) in Ile-de-France combined with attributes of other selected telecommunication initiatives. Although a synergy centre could be located within various types of buildings, this study suggests the reuse of a dilapidated inner city school building as a demonstration project. The most distinguishing feature of this synergy centre is that it is designed to accommodate more than one type of user profile. It is also designed to be more sociable and interactive to facilitate telecommuting and teleworking initiatives; provide another option to experiencing and accessing the Internet; and provide a synergistic and professional environment to enable individual and community growth.

The "Mission Synergy Centre - a Demonstration Project" was envisioned as an digital telecommunications initiative designed to respond to issues and questions raised during a series of community meetings for the drafting of the Redevelopment Plan for the Community of Mission. The drafting of the Redevelopment Plan occurred at the beginning of 1998 as an initiative from The Cliff-Bungalow Mission Community Association and The City of Calgary Planning and Building Department. In the spring and summer of 1998, a series of workshops involving members of the community and city administration took place to examine the issues, problems, and opportunities facing the Community of Mission. Subsequent meetings were held to examine and discuss the issues associated with the built environment, natural environment, and social environment in the Community of Mission.

This study assumes that every community in Calgary should allocate spaces and places for high-speed digital telecommunications. For the purpose of this study, the Community of Mission was chosen based on the familiarity of the community and to demonstrate that digital telecommunications should be evaluated within the context of the drafting of the Mission Area Redevelopment Plan.

This project takes on the challenge of answering the following questions suggested in the community meetings and discussions with friends, family, colleagues, and acquaintances:

- What is a synergy centre?
- Does Mission need a synergy centre? If yes, for what purpose and how will it be supported?
- What form will the synergy centre take? Where will it be located?
- Does the City need to change any bylaws or regulations to encourage synergy centres? If yes, which regulations?
- Are there any infrastructure needs, which are, at the present, discouraging the development of a synergy centre?
- Are there any technologies or businesses that are in direct competition with a synergy centre?
- Should the City create partnerships by acquiring, and making available, land for a synergy centre?

Based on a review of opportunities and barriers for a synergy centre in the Community of Mission, and supporting attributes of a synergy centre, answers to the questions suggested by the community meetings were sought after and recommendations were made. These recommendations area aimed at the municipal government and community association and include actions to foster the establishment of a synergy centre within residential Community of Mission in Calgary, Alberta.

2.3 Objectives

Assuming there is a large enough population to support a synergy centre, within a 10 minute commuting distance, the objectives of this study are:

- To provide the reader with an overview of telecommunications and planning literature, trends, telecommunication initiatives, and City of Calgary planning documents, in support of the proposed synergy centre.
- To demonstrate that there are opportunities and mutual benefits of integrating digital telecommunications in residential communities.
- To examine Mission's community profile and characteristics in support of a synergy centre.

- To identify characteristics of successful telecommunication initiatives, which could be integrated or applied to the proposed synergy centre.
- To provide a possible design solution that rethinks and re-purposes the former St. Mary's School through the adoption and integration of digital telecommunications infrastructure as part of an overall redevelopment strategy for the Community of Mission.
- To make recommendations on mechanisms for encouraging the incorporation of synergy centres in residential neighborhoods within Calgary.

2.4 Study Methodology

Different research methods were used in the course of this study; including a literature review, discussions, and review of Mission's community profile and characteristics in support of a synergy centre.

This study also investigates attributes of other telecommunication initiatives, which were considered desirable and applicable to the design and function of a synergy centre. Therefore, as part of the research, several examples of telecommunication initiatives were selected and summarized. A literature review and general discussions were also components of the study methodology.

2.4.1 Literature Review

The literature review element of the study included three components. The first was a review of literature related to telecommunications and planning with a focus on teleports and economic development.

The second component of the literature review was an inspection of planning documents, articles and Internet pages on telecommunication initiatives around the world.

The third component of the literature review was the examination of community characteristics of Mission in order to assess the possible viability of supporting a synergy centre.

2.4.2 Research on Telecommunication Initiatives

This qualitative method involved literature review and genera! inquiries to examine telecommunication initiatives practiced in other cities around the world. Based on their attributes and success, conclusions were formed regarding their suitability or adaptability to the Mission scenario. The criterion for the selection of the telecommunication initiatives was existence of at least one of the two following qualities: (a) a smart community development, meaning the utilization of technology and telecommunications, (b) a public and private partnership. The telecommunication initiatives of Neighborhood Office Network, Calgary's Technology Centre, High Tech Centers, Community Access Program, and The Society for Old and New Media were selected and summarized.

2.4.3 General Discussions

A number of general discussions with city planning staff, friends, acquaintances, and colleagues were conducted for this study. These discussions were aimed at confirming and gauging The City of Calgary's situation with respect to the literature review of historical and current information on telecommunications and planning, as well as gathering opinions about policies and attitudes towards synergy centres developed in a residential context. From these discussions, technical insight of the statistics and terminology of the following documents was derived: The City of Calgary Civic Census Travel to Work Studies, draft Mission Area Redevelopment Plan, Escape the Rush, Mission Community Profile, Calgary Plan, GoPlan, Calgary Land Use Bylaw, and Inner City Plan (1979).

As a conclusion to the study, recommendations to develop a synergy centre in Mission were formulated based on the findings and issues identified. These recommendations are aimed at the municipal government and the goal is to identify the need for synergy centres in residential communities. This synergy centre facility would accommodate different households, income levels, businesses to create a more digital capable residential neighborhood.

2.4.4 Study Limitations

This study has several limitations based on the research methodology that must be acknowledged in the context of the review of issues examined and the ensuing recommendations. These limitations are mainly related to the methodology and the time constraints of this study.

- The first limitation is the fact that official data and information on the subject was often not readily available.
- The second limitation relates to the subjective nature of the analysis.
- The third limitation to this study is the lack of an economic and marketing analysis.
- The fourth limitation is that telecommunications initiatives pose fundamental challenges to many of the conventional paradigms currently used in urban studies, planning, and policy-making.
- The last limitation of this project is the fact that it was prepared from a municipal and community perspective and did not include telecommunication providers' views, since providers were not interviewed.

The examination of economic and marketing analysis was not included as part of this study, primarily due to the lack of readily available information that was specific to the proposed synergy centre concept. The proposed synergy centre concept from an economic and marketing analysis is difficult to define since it is both commercial and institutional in nature. Furthermore, the uses within the proposed synergy centre are only speculative. The proposed uses would be determined and examined through a formal public consultation exercise that would involve surrounding businesses, institutions, and residents.

2.5 Expected Results

As a final product of this study, recommendations for a strategy for developing a synergy centre in the Community of Mission are provided. This document is intended as a Demonstration Project to be viewed by planners, policy makers, and community representatives in the City of Calgary that wish to encourage synergy centre development in residential neighborhoods.

2.6 Study Outline

Chapter Two includes a synopsis of the significance of telecommunications as it relates to digital telecommunications and planning. This portion of the study involves a literature review of telecommunications planning, newspaper articles, Internet research, and general observations.

Chapter Three briefly outlines a number of select telecommunication initiatives that vary in scale, scope, and level of partnership and investment. The most significant being the Neighborhood Office Network in Ile-de France, which the proposed synergy centre model was developed. The telecommunication initiatives were chosen to highlight design and digital telecommunications aspects that a synergy centre should include. As well, each initiative provides a unique perspective of

how digital telecommunications was utilized and applied to solve issues that were not otherwise possible using traditional planning methods.

Within Chapter Four, an analysis of the Mission Community Profile is provided in order to understand some of the issues and dynamics of the community. The intent is also to identify some of the opportunities and constraints to the development and integration of a synergy centre in the Community of Mission.

Chapter Five includes a review of The Calgary Plan, Transportation Plan, Inner City Plan, proposed Mission Area Redevelopment Plan, and the Calgary Land Use Bylaw in order to identify any constraints these document may have on the development and integration of a synergy centre within a residential neighborhood. This examination also provides for some understanding and insight of where the City of Calgary is in relation to its adoption and integration of digital telecommunications for community purposes.

Chapter Six proposes the redevelopment of the former St. Mary's School site as a synergy centre and provides some preliminary concepts. A site selection and preliminary evaluation is conducted in order to select a possible site within the Community of Mission. Membership profiles, stratification of access, diversification of uses, symbolism of the proposed synergy centre are introduced.

Chapter Seven (Conclusions) provides some recommendations on facilitating the development of synergy centres in Calgary's residential communities. It concludes how the synergy centre intervention rethinks and re-purposes the former St. Mary's School through the adoption and integration of digital telecommunications infrastructure as part of an overall redevelopment strategy for the Community of Mission. This chapter also suggests how the synergy centre could be implemented, recommendations for further study, some possible implications, and identifies some concern for competing technologies and businesses.

Chapter 2 - Digital Telecommunications

1.0 Introduction

The significance of digital telecommunications as a means for economic development and prosperity has evolved dramatically since the mid-1980s when the telecommunication industry in North America was deregulated. Planning for digital telecommunications, telecommuting, small office home office (SOHO) developments are still considered to be in its infancy, notwithstanding new research and policies that consider these topics. Research also suggests that digital telecommunications initiatives will have an impact on urban form. It is also evident that the research appears to be contradictory and inconclusive depending on the perspective or paradigm. For example, digital telecommunications challenges the planning paradigm understood and used by many planning professionals and educators.

2.0 The Significance of Digital Telecommunications

At the beginning of the Industrial Revolution, the economic powerhouses were the railroad centres and seaports. As global expansion quickened so too did the development of airports and superhighways that allowed for the movement of people, goods, and services to be transported within hours instead of days, weeks, or months. People and products continue to move by rail, ship, air, and road, but there have been new developments in the method of trading, as well as, the substance of what is being traded. The commodity is information and it is represented as voice, data, text, and video. This weightless resource has become the essential element of business and economic growth in the Information Age. What has become critically important is the ability to deliver this commodity effectively and efficiently.

Community leaders have considered roads, sewers, and electricity so vital to their manufacturing-based economies that they are referred to as "public goods" to be financed, constructed, maintained, and regulated by the public sector (Schmandt, et al, 1990). The distribution and access to these types of infrastructures have traditionally shaped and guided community developments throughout North America. Today, the development of digital telecommunications initiatives, such as teleports, at the municipal level has gained momentum and is recognized as an essential element in the management of economic growth that is required to support the growing information-based economy.

Municipal governments now recognize the importance in implementing the development of these digital telecommunications initiatives and are becoming more aware of the issues of digital equity. If information is increasingly equated with power, then the public sector's role in providing digital telecommunications infrastructure and facilities is far more critical to small firms than to large firms (Bradbury and Becker, 1995). Some large corporations have built their own telecommunications networks, which is financially prohibitive for the smaller firms. Small firms depend on the market place and private telecommunications firms to provide access to high-speed digital telecommunications. By recognizing the importance of small firms in the growth of the economy and their disadvantage in accessing high-speed digital telecommunications networks, Wilson and Teske (1991) recommend the immediate involvement of local governments and planners.

Traditionally municipalities were restricted to granting and regulating easements, conduit space, and rights-of-way agreements, while the monopolistic telecommunications providers, along with senior levels of government determined the shape of urban telecommunications infrastructure without municipal participation. Today, senior levels of governments are delegating more responsibilities to the municipalities as a result of down sizing and cutbacks. The result is greater local autonomy and increased amount of responsibilities that can include municipal involvement in the ownership, deployment, and location of digital telecommunications infrastructure.

At the same time, major advances made in fiber optic and wireless digital telecommunications are making digital telecommunications initiatives more affordable at the municipal level. This is having a tremendous impact on changing the shape of our cities. In the larger urban centres, people typically have better access to more advanced digital telecommunications infrastructure enabling them to telecommute, tele-shop, tele-work, and engage in other services on-line more readily than if they were located in a smaller urban centre.

At the international level, the adoption of digital telecommunications combined with computer technologies has facilitated the rate at which restructuring in the business world is occurring. These new applications and innovations are requiring corporations to refocus their priorities and management polices in order to become more efficient and competitive in the global market. Indirectly location and boundaries are becoming redefined, although not necessarily eliminated. Large corporations are now able to separate and co-ordinate different tasks virtually anywhere in the world through advances in digital telecommunications.

Globalization is occurring more rapidly and municipalities have the greatest amount at stake. Municipalities now recognize the importance of implementing digital telecommunications initiatives in an attempt to ensure their survival in the Information Age and to maintain their current standard of living. The development of teleports and similar digital telecommunication initiatives for economic development purposes, supported by public and private interests, are becoming more acceptable and desirable under current fiscal constraints. These types of digital developments and initiatives have great potential in allowing cities and regions to operate more effectively and efficiently. Access to digital telecommunications is also becoming an important location factor considered by information intensive businesses and users.

Gordon Arnaut (1995) suggested that "Shared-use communications hubs that combine satellites with other telecommunications facilities can transform a place into a smart city." Arnaut's article "Developing Teleports Makes Good Sense for Communities" informs the public about the evolution of telecommunications and how it affects business, government, and day-to-day life." Within the article he interviews John Jung, a Toronto planner and chairman of the Smart '95 Conference. Jung indicated that we need to develop new industries to be competitive in the future and believes that intelligent communities will foster and encourage the development of information-based businesses and industries. One of the goals of the development of "Smart Toronto" is to utilize the existing telecommunications infrastructure and make it available to those who demand it (Arnaut, 1995). This planned network, referred to as the Greater Toronto SmartNet, would be capable of carrying high quality video and audio signals to thousands of users simultaneously over fiber optic cables making it available to smaller companies and universities, which is key to the region's economic growth (Arnaut, 1995).

John Jung (1995) states that the creation, retention and enhancement of economic wealth for any community, economic development strategies must consider the opportunities that information technology and telecommunications can offer. He also emphasizes that communities must understand and evaluate the implications of not considering them. Cities around the world, including Canada, have developed significant partnerships among government, business, and institutional in order to create knowledge-intensive centres geared to harness economic development in their regions. In Canada this has been possible through the "Smart City" initiative. Jung (1995) also notes that the facilities at the heart of these knowledge-intensive centres have been called everything from Infoports to Mediaparks and Technopoles to Telecentres and Teleports. He argues that these teleports provide the necessary technical facilities utilizing every form of telecommunications media to provide secure and affordable links between the local marketplace and the world.

3.0 Planning for Digital Telecommunications

Planninn rpcparrhprc anrl nrnfpccinnak haVp nnlv rprpntlv Qtartpd tn im/PQtinatp thp nntpntial imnartc nf Hinital initiatiupc nn telecommuting, teleworking, and tele-services at the municipal level. Planners now recognize that digital telecommunications initiatives have the potential to impact and shape communities by influencing where we live, work, play, and learn.

Graham (1997) states that part of the reason is that "telecommunications-based developments pose fundamental challenges to many of the conventional paradigms which still underpin - albeit implicitly - much of urban studies, planning, and policy-making." In the article "Cities in the real-time age: the paradigm challenge of telecommunications to the conception and planning of urban space", Graham (1997) considers telecommunications as a paradigm challenge for urban studies and policymaking. He states that the reasons behind the relative neglect of telecommunications in urban studies and the relative lack of empirical work in the area are complex. Graham suggests that the reasons are more fundamental than practical issues related to the lack of data. Some of the major conceptual problems identified and explored by Graham include the challenge of invisibility, the conceptual challenge, the challenge to urban planning, and the challenge of containment. The challenge of invisibility relates to the fact that telecommunications networks tend to be largely invisible, silent, stealthy, mysterious, and incremental in themselves and in their effects on cities; this makes them an extremely difficult subject both for urban research and for urban policy development (Graham, 1997). The conceptual challenge occurs since it is difficult to reconcile classical notions of time and space with the ways in which digital telecommunications remake and rework time and space within and between contemporary cities (Graham, 1997). The challenge to urban planning today is that the traditional concepts of urban and regional planning are outdated, while the desire is to use digital telecommunications as a structuring element in cities and regions and to incorporate telecommunications in economic and social development (Graham, 1997). The fourth and final conceptual problem is the challenge of containment which stems from the contradictory relationships between cities as bounded pieces of territory and digital telecommunications as real-time networks which enable users, by definition, to instantly transcend the limits of such bounded pieces of territory (Graham, 1997).

Further to "the challenge to urban planning" Graham (1997) suggests that the evolution of urban planning and policy was heavily influenced by the positivist theories of urban development to improve the locational efficiency of cities and urban regions, based on the "perfect" physical systems predicted by theory. Planners assumed that cities were physically integrated places, amenable to local land-use and development policies, that would go on to solve the economic, social, and

environmental problems, while space and time were seen to be little more than the external containers for urban life (Graham, 1997). At the same time, the responsibility for regulating and developing urban telecommunications fell into the jurisdiction of distant, centralized, public bureaucracies or virtually autonomous public and private enterprises. As a result, the telecommunications infrastructures were developed according to central government policy rather than to any local concept of urban planning. There seemed to be no relevance of telecommunications to urban planning, because these infrastructures were geared to the basic telephone, which was developed to be universally accessible (Graham, 1997). Today, access to high-speed connections (evolved from the basic telephone) is not necessarily universally accessible and recognition of urban telecommunications infrastructures has resulted in a broader debate of how to plan for "knowledge-based" urban development. According to Graham, planners are beginning to harness telecommunications as a potentially powerful new tool to help confront contemporary problems of urban management and development. Cities can no longer just be considered as passive victims of the "impacts" of telecommunications, as they tend to be in many popular accounts of technological change (Graham, 1997).

With regards to planning education, Graham (1997) observes that telecommunications is rarely covered in planning courses on urban policy, management, and planning. When talking of "urban infrastructure" of the built environment, educators, policy documents, and urban researchers invariably still tend to be talking about the familiar or traditional "physical infrastructures" such as roads, sewers, water, and electricity.

Research and development of digital telecommunications initiatives has traditionally been the responsibility of telecommunication providers and regulated by more senior levels of government. As a result, municipal governments have had limited experience in the development of digital telecommunication infrastructures through the granting of easements and rights-of-ways which senior governments regulated. However, this is changing as some larger municipalities like Toronto, Ottawa, Vancouver, Edmonton, and Calgary have specialists who are involved in the development of digital telecommunications in community development initiatives.

4.0 Planning for Telecommuting

Planning can encourage, but sometimes inhibit telecommuting and its impact on development patterns (Handy and Mokhtarian, 1995). What are planners doing and what should they do to encourage and respond to telecommuting?

Handy and Mokhtarian suggest that planners will influence the future of telecommuting, particularly in transportation planning where planners have been active in encouraging telecommuting as a strategy for travel demand management to meet air quality requirements and reduce traffic congestion. There is a significant net benefit from telecommuting in terms of reduced travel, energy use, and emissions (Handy and Mokhtarian, 1995). It is also suggested that certain types of transportation policies may encourage telecommuting, such as those relating to the cost of commuting, traffic congestion, and parking fees.

Although land-use planning done today typically does not inhibit telecommuting, exceptions do exist where the bylaws do not even allow residents to work at home (Handy and Mokhtarian, 1995). Apparently some municipalities prohibit working at home if it involves electronic equipment while some others specifically prohibited home-based businesses in residential neighbourhoods (Baer, 1995, and Fanselow, 1992). Since the early nineties, planning has evolved to allow for a greater range of home-based businesses through mixed-use development also - generally - that would make telecommuting more attractive (Frank, 1993). It is believed that mixed-use developments would allow for greater transportation savings, since trips would be shorter and more often made by walking rather than driving (Handy and Mokhtarian, 1995). It is also suggested that mixed-use developments create a sense of less isolation associated with working at home in the suburbs (Handy and Mokhtarian, 1995).

Handy and Mokhtarian (1995) suggest that land-use planning could encourage telecommuting even more directly by providing for the following possibilities:

- Requirements or incentives for new developments to provide telecommunications infrastructure would make higher levels of telecommuting possible by expanding the range of work tasks that could be accomplished at home and making telecommuting easier.
- House designs could include spaces suitable for home offices.

- Neighborhood tele-centers (synergy centres) could be encouraged as an element of mixed-use developments. Residents would then have the option of not having to work at home, but be within walking or biking distance of the work site. Thoughtful design would be needed to successfully integrate tele-centers into the neighborhood.
- Regional tele-centers, drawing telecommuters from larger areas, could also be encouraged; this would require attention to the location of the center and to adapting the transit system to reduce the need to drive to the center.
- Land use-policies that encourage infill, mixed-use, and higher-density development could help to maintain the benefits of telecommuting, but they must be consistent and coordinated at a regional level.

In 1998, Stanek and Mokhtarian completed a study that reported the preferences to telecommute from home and from a center. They recognize that home-based telecommuting is still fairly commonplace, but that center-based telecommuting is a relatively recent form that involves traveling to work at an office near home and remote from the regular workplace.

Centers tend to mitigate the disadvantages of home as a work location, while providing:

- A boundary between work and home;
- An environment free of household distractions;
- The opportunity for social and professional interaction; and
- For the employer, the center has a more professional image.

Stanek and Mokhtarian (1997) suggest that even though home-based telecommuting has been the most popular form to date, it is unclear at this time which form of telecommuting will ultimately dominate. They speculate successful centers of the future, on-site telecommuting will constitute only one of several, perhaps an almost incidental line of business for the facility (Stanek and Mokhtarian, 1997). In the potential long-term viability for center-based telecommuting may be in connection with alternative uses of tele-center facilities with the trend toward non-territorial office arrangements. Non-territorial office arrangements are where employees are shifted from a permanently assigned office in a single facility to temporary assignments in any of a number of corporate facilities as needed, which may include the use of tele-centers.

In the City of Calgary, city administration has begun asking the questions of where people will live, work, play, and learn, Former Alderman Jon Lord suggested that the City of Calgary should encourage telecommuting as a way to reduce traffic problems and pollution. Lord also thought that the City should take the lead role in the initiative, since it employs more than

10,000 people and could demonstrate the benefits of telecommuting prompting more private sector companies to follow suit, as the case in other major cities.

In 1999, The City of Calgary released Managing Transportation Demand in Calgary, which recommended that the City of Calgary should adopt a community leadership role by providing Transportation Demand Management incentive programs for City of Calgary employees such as flextime, telecommuting, parking management and alternative travel mode incentives.

Within the report, telecommuting was defined by The City of Calgary as a concept that allows an employee to perform some or all of their work at home or at a satellite work centre instead of at the normal place of business. The City also indicated that telecommuting can result in reduced total travel and reduced peak travel and can result in increased employee productivity, moral, and reduced absenteeism. It is noted that this type of work practice is limited to certain types of occupations and businesses and that some people are not able to work in isolation from their workplace or may not have a suitable home environment. Unfortunately, the study does not offer any further explanation of suitable home environment for telecommuting.

In 2000, The City of Calgary implemented Escape the rush: How Your Business can Benefit. This program was designed to encourage different ways to work or get to work and demonstrate how companies are being rewarded with huge cost savings, and healthier, and happier employees. The programs presented vary from teleworking, bike, walk & skate to work, flextime, ridesharing, transit, and City of Calgary programs (City of Calgary, 2000). As well, the City also highlighted its own teleworking program for a telework policy and implementation strategy for municipal employees (Escape the rush, City of Calgary, 2000).

5.0 Planning for Small Office (SOHO) Development

As previously noted, Statistics Canada indicated that there are approximately three million Canadians who own and operate a small office or home office (SOHO) from their private residence. It is anticipated that this type of development will become more and more common in the years to come. It is also possible that the task to manage and regulate these types of uses from a land use planning perspective may result in further restrictions to what is permitted and discretionary in residential land use districts within the Calgary Land Use Bylaw 2P80.

Under the Calgary Land Use Bylaw 2P80, two types of home occupations [SOHOs] are allowed in the City of Calgary. The first type is a Class I Home Occupation, which has no effect on the surrounding neighbourhood. This type is allowed in all

residential neighbourhoods. The second type is a Class II home occupation, which has minimal effect on the surrounding, neighbors. This type is allowed only if no adverse impact on the neighbors can be guaranteed.

According to Calgary Land Use Bylaw 2P80, the basic rules for a Class I Home Occupation are that the business must not be visible from outside the home, business activities must be conducted in the home by a resident, and have no impact on the surrounding neighbors. Examples of home occupations that may fit under the Class 1 rules include desk and telephone occupations, cottage crafts and a consultant's office (three or less visits per week). On the other hand a Class 2 Home Occupation permit allows more flexibility, including a potential impact on neighbors. Examples of home occupations that may fit under the Class 2 rules include hairdressers, music teachers and a consultant's office (which allow more than three visits per week).

As noted, the Calgary Land Use Bylaw allows for the development of SOHOs, but there are other exceptions, which may reduce the number of Home Occupations in a community. These exceptions include parking requirements within the Calgary Land Use Bylaw, physical size of the residence, developer restrictive covenants and caveats, and security.

Although the Calgary Land Use Bylaw 2P80 is the legislative mechanism, which permits the development of SOHOs in private residences, it also contains a section on parking requirements. These parking requirements can sometimes make it more challenging for individuals seeking approval for a Class 2 Home Occupation Permit. It may be more difficult and in some cases impossible for an individual living in an apartment style building to provide additional on-site parking for a Class 2 Home Occupation. However, if apartment style buildings were required to provide additional on-site parking for home occupations then this could solve some of the typical parking deficiencies associated with apartment style dwellings.

The physical size of a residence may also limit its potential to adequately accommodate a home occupation for SOHOs and telecommuting. There is also an inherent opportunity cost associated with converting space within your residence for work rather than for living. In Japan, residences are typically confined and excess space for home occupations or telecommuting is virtually non-existent. In Calgary, the incidence of home occupations may be related to the size or type of the residence, however this data is not currently available from the City of Calgary.

Some developer restrictive covenants and caveats, such as the one discovered in the Community of Elbow Park in Calgary was registered in 1912, which states that no work shall happen within or on the premises (Alberta Land Titles, 1912). The

unfortunate part is that today some neighbors could argue that this restrictive covenant applies to teleworking and telecommuting. The landowner could try to have the restrictive covenant or caveat discharged by Court Order, but this typically requires the consent of the surrounding landowners.

In some situations, landlords and condominium boards are concerned and believe that home occupations are a security issue. As a result, some landlords may not permit home occupations in their buildings. As well, within a residential condominium the bylaws may prohibit or discourage home occupations for similar security reasons.

At the time of this study, information about the current trends and patterns of distribution of home occupations in Calgary were not available. This information was not available for two main reasons. Firstly, this information is currently not monitored at a the community level. Secondly, the information is incomplete as the City records only include registered home occupations. The City is currently addressing these issues.

Information of home occupations would be extremely useful to determine if there are relationships between the location of home occupations and the size and location of dwelling types. If one were to speculate about the distribution of Class 2 Home Occupations in Calgary one would expect a greater percentage of them to be located in single family residential dwellings compared to other forms of residential dwelling types, such as condominiums and apartments. Given this assumption it would then be possible predict where Class 2 Home Occupations would likely exist within the City limits. I suspect, that if dwelling types were plotted on a city-wide map, it would provide us with some general locations of where Class 2 Home Occupations could be located. In comparison, I would assume that single-family detached residential dwellings would have a higher incidence of Class 2 Home Occupations than apartment style residential dwellings. I would also anticipate that there would be a stronger relationship between Class 2 Home Occupations development and dwelling type than there would be between Class 2 Home Occupations development and land use.

If we assume there is a direct relationship between Class 2 Home Occupations development and dwelling type, we can anticipate that the introduction of sensitive intensification expected in inner city communities will threaten the development of Class 2 Home Occupations in these areas. Through sensitive intensification existing dwelling types of single-detached residences are replaced with higher density apartment style residence. Eventually this would result in fewer opportunities for Class 2 Home Occupations developments in inner city communities versus new suburban communities.

6.0 Possible Implications of Digital Telecommunications on Urban Form

Thoro oro man\/ nnccihlo imnliratinnc nf Hinitol talannmmiininotinnc nn nrhon fnrm inrl onmo nf thn mnrn nn+nhln nvnmnlnr are highlighted in this section. All are possible, but the important aspect is to recognize that each provides a slightly different perspective and for this reason it is difficult to make certain conclusions. Each possibility also appears to suggest that some type of change is inevitable and this would be largely dependent upon the degree in which we immerse ourselves in the digital world. Some of the arguments and suggestions presented are for cautionary measures and others or made to identify both opportunities and constraints associated with making the link between the impact of digital telecommunications on urban form.

Robert Fishman (1987) believes that the phenomenon known as the "technoburb" should not be misunderstood simply as suburbanization, but conceived as a new city. This new city, as in most technoburbs, is based on the development and adoption of digital telecommunications technology where "the very existence of the decentralized city is made possible only through the digital telecommunications which has so completely superseded the face-to-face contact of the traditional city (Fishman, 1987).

In The Informational City: A New Framework for Social Change, Manuel Castells (1991) discusses the impact that restructuring of organizational control from headquarters has on cities. He notes that most of the corporate headquarters are still highly centralized in the central business districts (CBDs) of the largest metropolitan areas in the United States. The largest corporations in the United States have been found to be located in the largest cities (Gillespie and Williams, 1988) and thus demand the development of digital telecommunications systems. Matthew Drennan (1991) has also found that headquarters of information-intensive businesses in the United States tend to locate in "global" cities.

Castells (1991) also makes reference to a new concept of "nodal" cities as locations in particular regions of a few countries, which are able to attract and concentrate top management activities. Nodal cities are evolving cities, which are capable through the co-ordination of public and private efforts, to compete in the global economy. Within the global economy these nodal cities are able to communicate and trade beyond their traditional peripheral boundaries through the development of teleports, which use digital telecommunications.

Working within the global network many corporations are able to decentralize or shift some activities (routine tasks) to other cities, while actual key decision-making units are increasingly concentrated in the centres of global and nodal cities. These

commanding places need a cluster of specialized services and access to advanced telecommunications facilities which make it possible to reach out to the entire planet from a localized area (Castells, 1991). It is expected that the most advanced telecommunications infrastructure will exist in both nodal and global cities where specialized services at the local network level are capable of functioning in the global economy.

In Reconstruction of Social Meaning in Space of Flows, Manuel Castells believes that the implicit tendency of the post-industrial society is to detach ones self from traditional cultures, values, and communities. For example, Castells (1991) suggests that "the current process of total internationalization of the economy may also lead to the renaissance of the local state, as an alternative to the functionally powerless and institutionally bureaucratized nation states." The understanding is that municipal governments are more flexible and have the acute ability to react to changes in the world economy (Castells, 1991).

Saskia Sassen (1994) suggests that the dominant images of the instantaneous transmission of money around the globe and the neutralization of distance through telematics are only partial and inadequate representations of what globalization and the rise of information economies actually entail for cities. These representations appear to be missing the actual material processes, activities, and infrastructures that are central to the implementation of globalization, making the predictions based on these images alone to be misleading (Sassen, 1994).

The Telepolis, envisioned by Javier Echevarria (1996), is a de-territorialized city having a network of points geographically scattered and linked through digital telecommunications. One of the most important aspects of future life in Telepolis is teleworking. Echevarria suggests that this would mean a major transformation of the production structure and have a significant impact on domestic spaces. In Telepolis there will still be activities that will require the physical presence of people, but eventually many of the economic sectors will be able to adapt to distance production and consumerism. As a result, a large percentage of work will be done in the home requiring these productive domestic spaces to be designed meticulously, while cities would simply become spaces for walking and relaxing (Echevarria, 1996).

In Invisible Cities, Hal Cohen (2000) provides some of the most insightful views that the Internet is not making urban centers obsolete. According to Cohen's literature review of the new economy, cities are supposed to have no place in the new economy. Instead Cohen offers an opposing perspective and suggests that reality is currently headed in a different direction. His premise is that if you want a good job as a programmer, new-media player or biotech researcher, you have a choice of

living in perhaps a dozen big cities. Moreover, that the most innovative firms tend to locate in highly concentrated urban districts such as Cambridge, Mass., Manhattan's Silicon Alley or the Loop in Chicago. He also believes that the forecasts for urban decline remain pervasive and suggests that theories like these are disconnected between reality and the popular folklore. Cohen also believes that the world in the future will not be so different from what it is today and that there will not be a complex restructuring of economic geography.

Cohen (2000) makes the argument that Negroponte's prediction that "bits" meaning information are replacing "atoms" as the embodiment of value is not reality since "bits" are still bound by the same old laws of economics. He also advances that this would suggest that space and place become irrelevant, and there is no longer a reason for urban agglomerations. However, in the real world even "bits" have to go on things (CDs, Zip disks), through things (fiber-optic, coaxial), and into things (Internet servers, PCs) for them to matter. It is these products that have mass and require a physical location, which he believes to demonstrate that the same old laws of economics still apply.

Cohen also argues that investments to existing infrastructure will typically occur in already dominant areas in order to minimize risk. Therefore, today's technology requires digital telecommunications infrastructure, which will continue to be upgraded between the same important info-hubs (regions and cities) that already dominate via copper connections, often on rights-of-way of even older infrastructure such as railroads and highways, reinforcing those networks' traditional, city-centric organization of space (Cohen, 2000). Furthermore, that large metropolitan areas are where the big information users will locate, which will then generate the demand for infrastructure that is constructed causing more users to locate in the area in a snowball effect (Moss, 1999). In addition, outside these agglomeration areas the laying of new fiber-optic cable is not cost-effective and there probably won't be any substantial reduction in price over time since the cost is primarily labor (Gates, 1999).

Another concept that Cohen believes to be deployed rather haphazardly is "decentralization." He suggests that the word generally conjure an image of an evenly spreading circle of uniform depth, like oil on water. In comparison, Cohen (2000) states that, "new technology, especially telecommunications technology pushes connected economic systems further from the center than ever before, and within this context that "decentralization" takes on the sense that an army is "decentralized" when its general deploys it into the field." The most notable example of decentralized concentrations is that of "edge cities." Within these edge cities people and resources come together, buttressing the power of the metropolitan region (Cohen, 2000).

Cohen (2000) suggests that what has really happened is that "tertiary" activities such as accounting, consulting and marketing, have become generators of wealth in their own rights. And place-bound "industry" has not been made irrelevant by placeless "information," but rather the whole spatial system supporting both has become much more complex. Castells (1989) confirms this with "the emergence of a space of flows [that] dominates the historically constructed space of places." The idea is that where Denver "is" in high-tech America is defined by its place within the telecom networks; its connections to interstate and air-transport systems; and its notch in regional high- and low-tech economies, while its "actual" location in the middle of Colorado is all but irrelevant (Cohen, 2000).

The recent resurgence of downtown, at least in the largest of data hubs, may actually be partially the result of new technologies, as our cities become informational rather than industrial, and thus more agreeable places to live. As well, Mitchell suggests that new technology will enable places to have a much-finer-grained intermixture of business and residential that enables you to develop a different kind of neighborhood structure (Cohen, 2000). Examples include places like South of Market in San Francisco, New York's SoHo, areas of Brooklyn and Oakland [California]. Mitchell also comments that, "all of these traditional urban areas that are being re-purposed are vibrant, attractive, interesting places to be."

Despite what some telecommunications experts would recommend for high-tech businesses' strategic plans, firms and people who consider abandoning cities will do so at their own risk. Cohen concludes that where-it's-at will always have a "where" in it, and it will never be out in the "boondocks." As the spatial forces driven by new technology [digital telecommunications] take effect, cities will become different kinds of places, but they will also be increasingly central to the nation's economy (Cohen, 2000).

Paul Hoffert (2000) suggests that a local connected community (with wires or wireless), not the global village will characterize the new millenium. This Digital Age will move products, services, and information to people using the digital highways and online routes, promoting localization. This is supported by new research by Keith N. Hampton (2001), who suggests when neighborhoods are connected with local digital networks they are friendlier and more supportive of face-to-face socialization, family values, and local interest, instead of isolating themselves in their homes and becoming monitor-zombies.

7.0 Conclusion

Digital telecommunications and its potential impact on urban form appear to be gaining interest and momentum in planning. Planning research in the areas of telecommuting and small office home offices is increasing, but there continues to be a tremendous amount of research that is still required. This research will continue to be plagued by the fact that digital telecommunications appears to challenge the planning paradigm understood and used by many planning professionals and educators. More importantly, the utilization of digital telecommunications provides for new opportunities and urban forms that appear to exceed those achieved through the adoption of previous technologies, such as the railroad and highway. Digital telecommunications not only provide us with the ability to change the way things are done (processes), but also how, when, and where we live, work, play, and learn.

As we move from a global perspective down to a local municipal perspective the ability to evaluate and study the impacts of digital telecommunications initiatives appears to improve. The concept of "thinking globally and acting locally" seems to make more sense at the municipal planning level, since these interventions (telecommunications initiatives) typically occupy physical space within a planned community. In addition, the potential impact that digital telecommunications could have on urban form is site specific and regional in nature, since the applications tend to reflect the intent of the telecommunications initiative.

Chapter 3 - Telecommunications Initiatives

1.0 Introduction

For this study five telecommunications initiatives were selected and examined. These initiatives demonstrate the flexibility and level of specialization that digital telecommunications can deliver to nations, regions, communities, and individuals. Through cooperation among government, industry, educators, and the citizenry, these initiatives also demonstrate that through the use of digital telecommunications existing places and spaces can be transformed with new purpose and possibilities. As well, the initiatives suggest that the impact and change brought about through the adoption and integration of digital telecommunications is fundamental rather than incremental.

The following is a brief description of the digital telecommunications initiatives examined (see Appendix B):

- **Neighborhood Offices Network - CATRAL, Ile-de-France** involves the creation a network of neighborhood tele-working offices on the periphery of Paris through the use of technology in an attempt to reduce the level of traffic congestion in Paris. The Neighborhood Office is a professional working environment that is open to the public and provides various solutions to implement teleworking. The typical services and solutions for tele-working include dedicated office space, computer workstations connected to high-speed Internet access, and boardrooms equipped for teaching and training purposes. Space can be reserved for special events such as public meetings, exhibits, or sales presentations. Independent tele-workers have access to logistic support when working from home as well as when they are in a Neighborhood Office. These Neighborhood Offices are typically located near access points to the public transportation system and are linked together by public or private digital telecommunications networks. The synergy centre is modeled after this initiative.

- **Calgary's Technology Centre - Calgary Technology Inc.** operates a high-tech incubator facility in the University of Calgary's Research Park, offering a variety of one-stop services to its tenants. The Calgary Technology Centre is a 120,000 square foot facility located in the University of Calgary Research Park. The facility is ten minutes from downtown Calgary and within walking distance of a Light Rail Transit Station, restaurants, shopping, parks and recreational facilities. The facility currently houses approximately 75 high-tech companies ranging from one-person startups to established,

publicly traded corporations. The facility offers its tenants with access to offices, laboratories, and prototype development facilities that enable and foster high-tech innovation and research.

- **High Technology Centers - Newark, New Jersey** illustrates the re-purpose of former industrial/retail property in order to meet the space demands of telecommunications companies. Old industrial and commercial buildings typically have sturdy floors and high ceilings to accommodate heavy, delicate equipment, abundant electrical power and access to the fiber-optic cables found along established railroad lines.

- **Community Access Program - Industry Canada** is a federal initiative that is intended to provide universal access to the Internet and to improve the technology capabilities of all Canadians. All Community Access Program site locations are designed to be accessible to all members of the community, including those persons with disabilities. This is achieved through "smart-card" technology is used to adapt the computers to meet user preferences and abilities. A "smart-card" is similar to your banking-card that also contains computer chip with information regarding the user's identification and computer configuration preferences. This "smart-card" technology allows the same computer to be used by a variety of types of users, including those with disabilities.

- **The Waag (The Society for Old and New Media) - Amsterdam, Netherlands** is a cultural research and development centre for communications technology that provides a sociable application of technology utilization in Amsterdam. The development of technological applications for the cultural and social expression of groups and individuals is believed to be central to "The Society." It is place where designers, software engineers, artists and scientists collaborate with outside partnerships in the social, education, trade and industry sectors of the economy. The Waag building also has a media lab, a monumental conference theatre, and a restaurant-cafe. The types of activities that are supported in The Waag building include Internet access, computer software & design, training, workshops, conferences, and exhibits within a social atmosphere.

2.0 Conclusion

Each of the telecommunications initiatives examined have a unique perspective and desirable aspects that will be integrated into the synergy centre concept. Based on the telecommunications initiatives examined a synergy centre should have good access to public transit, telecommunications infrastructure, public amenities, and large population base. The synergy centre should also provide for a variety of users, purposes, and a sociable setting that enables residents to utilize and access digital telecommunications in order to encompass the largest possible spectrum of users within the community and surrounding area.

It is apparent that synergistic and social environments can be achieved through the integration of technology and telecommunications. All of the initiatives appear to generate some level of synergy through shared services and utilization of telecommunications. The Waag demonstrates that telecommunications technology can create a more sociable and interactive environment through the application of technology utilization.

The telecommunications initiatives examined also suggest that space and high-technology equipment within a common space can be more economical and feasible when shared amongst a group rather than individual ownership. This is dependent on the type of technology that is being accessed, complexity, and cost to obtain and maintain the technology. Shared equipment can make technology more accessible and affordable, this would likely be more applicable for the casual teleworkers, who may not demand technology and high-speed Internet access on a daily basis.

Opportunity and choice is also demonstrated in the telecommunications initiatives examined. The Community Access Program in Canada provides rural, remote, and inner city communities the opportunity and choice to access to the Internet, The Neighbourhood Office Network in Paris, France also provides opportunity and choice to telecommute from a professional neighbourhood office instead of commuting into the city each day. The proposed synergy centre is intended to provide opportunity and choice for individuals within and surrounding the Community of Mission. The opportunities envisioned within a synergy centre could range from Internet access to teleworking. The choice can be working in a professional and digital environment within your community instead of from your private residence.

The budget of the telecommunications examined range from $17,000 (US) to millions of dollars depending on the complexity and the size of the facility or facilities. In many of the Community Access Program sites the funds are typically used to upgrade or purchase computer equipment and provide high-speed Internet connections in public facilities such as public

schools, community centres, and public libraries. At the other end of the spectrum the Neighbourhood Offices Network in Paris, France is very complex and includes funding and investment from all levels of government and private industry. The average cost to build a Neighbourhood Office is approximately $525,000 (US) and the facility would charge daily rental rates of $70 to $105 (US) per day depending upon the level of service required. There are approximately 100 unconfirmed Neighbourhood Offices, which translates to an estimated $52,500,000 (US) for the Neighbourhood Office Network Program. This number becomes less significant when it is compared to the approximate 12,000,000 hours that are consumed in Paris every day in traffic jams and hour-long train commutes (Gauthier, 1995). This is equivalent to approximately 1,500,000 people working a regular 8-hour workday or $120,000,000 (US) per day assuming the average wage is only $10.00/hour.

Similar to the telecommunications initiatives examined the cost to build a synergy centre would depend on the proposed uses, size of the facility, and if it is integrated into a public facility. The anticipated cost is $525,000 (US) similar to the average cost of a Neighbourhood Office and user fees would cover the cost of all operations and upgrades. User fees would depend on the level of service. Partnerships and possible subsidizes could be considered as a means to provide some services that are considered to have a societal benefit or/and regional economic benefit.

Chapter 4 - Mission Community Profile

1.0 Introduction

Mission is an inner city community located in the southwest quadrant of the City of Calgary and immediately south of the downtown core and the Calgary Tower. Mission is a strong and vibrant inner city community with good access to downtown Calgary and regional amenities. It's eclectic housing stock of varying styles and types provide residents with affordable housing alternatives. This mixture also lends to the diversity of people who live, work, play, and learn in the Community of Mission. For the purpose of this study, this chapter examines the community profile in order to gain a better understanding of the community. The proposed synergy centre is shown as a star in the aerial photography provided below.

Figure 6. *Aerial photo of mission and surrounding communities*

2.0 Brief History & Potential Heritage Sites

Mission has a long history with significant milestones and was first settled in 1883 by the Fathers Lacombe and Leduc, who homesteaded two sections of land south of downtown Calgary. The Communities of Mission, Cliff Bungalow, Erlton, and Roxboro now occupy this area.

A small French speaking community developed around the St. Mary's Church and became known as Rouleauville. Apparently, it was named after the Chief Justice Charles B. Rouleau who resided in the area. In 1907 the City of Calgary annexed Rouleauville and after the annexation it was renamed the Community of Mission.

Before the 1907 annexation, 4 Street SW (Broadway) developed as a local commercial area serving Mission and neighboring communities. Commercial development form was typically limited to two or three storeys in height, having ground floor commercial uses with apartments above. Since the 1950s the redevelopment trend has included multi-storey commercial buildings. This has since been followed by an influx of mid-rise buildings with mixed commercial and residential uses.

Historical documents indicate that the majority of the original residential development in Mission occurred from 1900 until 1914, as well as infill-type development up to the early 1920's. The form of development that took place during 1900 to 1914 was single-family detached homes with some having upper suites. Prior to 1945 a small number of apartments were built in the "moderne" architectural style. In the 1950s the majority of the residential construction was four-story walk-up apartments. Eventually, the redevelopment trend evolved to high-rise condominium development (south of 25 Avenue SW) during the late 1970s.

The Draft Mission Area Redevelopment Plan recommends that the entire community be blanketed as a heritage district, meaning that all buildings of at least 45 years in age may be considered a potential candidate for this special district. The mechanisms and implications have not been worked out at the time of this study and will also require Calgary Council approval. There are a number of potential heritage buildings located within the Community of Mission, however only the former Canadian National Railway Station building has been designated as a provincial heritage building. At the local level the City of Calgary's Heritage Advisory Board recognizes the former St. Mary's School (1916-2 Street SW) as a potential heritage building, as well as several other buildings within the community.

For reference the City of Calgary's Heritage Advisory Board Ranking is summarized in the *Table 2.0 City of Calgary's Heritage Advisory Board Ranking.*

Table 2.0 City of Calgary's Heritage Advisory Board Ranking

Category	Common Name & Address
A	Holy Cross Centre, 2210-2 Street McHugh House, 110-18 Avenue Rouleau House, 114 - 8 Avenue **C.N.R. Station, 141 -18 Avenue** Sacred Heart Convent, 225 - 19 Avenue Lang House, 228 - 26 Avenue
B	(former) St. Mary's School, **1916-2** Street
C	Bannerman Block, 2306 - 4 Street House of Israel, 102-18 Avenue Sibley Apartments, 316-18 Avenue Flexford House, 304-21 Avenue Strand Apartments, 237 - 25 Avenue
Source. *The City of Calgary. 2000.*	

3.0 Population

Growth rates for Calgary and Mission are shown in *Table 3.0 Population of Calgary and Mission.* From 1995 to 2000, Mission grew at a rate of 10.2% and Calgary 14.9%. In relative terms, the new growth in Mission was a result of redevelopment, while the majority of the City's growth was a result of new development. A 10.2% rate of growth based primarily on redevelopment suggests that the community undergoing some significant changes. Full development of Mission under the existing land use districts would accommodate a population of 8,000 persons living in 5,600 dwelling units (Mission ARP, 1982). This is approximately 2.2 times the existing population and additional population could also be accommodated within areas designated for commercial use along 4 Street SW and 17 Avenue SW and increase the total population around 10,000.

Table 3.0 Population of Calgary and Mission

	1995	1996	1997	1998	1999	2000	% Change
Mission	3,325	3,406	3,510	3,550	3,614	3,664	10.2%
Calgary	749,073	767,059	790,498	819,127	842,388	860,749	14.9%
Source: City of Calgary, Civic Census, 2000.							

4.0 Age Groups

Table 4.0 Age Groups for Calgary and Mission is shown below. For each age group an absolute and percentage value is provided. Mission's population can be divided into three major categories. The first category contains a small population of children to young adults, ranging in age from 0-19 years of age. The middle category contains the largest population of adults, ranging in age from 20-54 years of age. The final category contains a slightly above-average population of older adults, ranging in age from 55+ years of age.

Relative to the Calgary composition, Mission's first category is below average, while the second and third categories appear to be both above the Calgary average in composition. In summary, Mission's population has a very small population under the age of 19 and has an above-average population over the age of 20. The findings suggest that the population is a mixed mature population ranging from young adults to seniors.

Table 4.0 Age Groups of Calgary and Mission

	Mission		Calgary	
	Number	**Percent**	**Number**	**Percent**
0-4	34	0.9%	51,912	6.2%
5-14	42	1.2%	114,995	13.7%
15-19	38	1.1%	55,1bb	6.5%
20-24	**326**	9.0%	63,961	7.6%
25-34	**1,235**	34.2%	145,114	17.2%
35-44	**703**	19.5%	167,494	19.9%
45-54	**391**	10.8%	111,336	13.2%
55-64	**269**	7.4%	57,337	6.8%
65-74	**310**	8.6%	45,911	5.5%
75+	**266**	7.4%	29,163	3.5%
Total	3,614	100.0%	842,388	100.0%

Source: City of Calgary, Civic Census 2000.

The 20-54 age cohort is approximately 2,700 persons and if we assume that 1-2% would benefit from a synergy centre that is only translates to 54 persons in Mission. However, given the potential total population of 8,000 - 10,000 in Mission and assuming the 20-54 age-cohort percentage is maintained this translates to approximately 54 x 2.5 = 118-145 persons. The number of persons ages 20-54 could be increased further by including adjacent communities.

5.0 Household Size and Composition

In Mission, 61.8% of the total occupied dwellings consist of only one (1) occupant, while 95.5% of the total occupied dwellings consists of two (2) or less occupants. These results are likely related to the fact that the overwhelming type of dwelling in Mission is the apartment style.

Table 5.0 Occupancy Size for Dwellings in Mission

	1	2	3	4-5	6+	Total Occupied Dwellings
Mission	1,540	840	87	22	3	2,492
Percent	61.8%	33.7%	3.5%	0.9%	0.1%	100.0%
Source. *City of Calgary, Civic Census, 2000.*						

The net area of Mission is 34 hectares (83 acres). Approximately, 51% is actually used for residential purposes. Within the residential area 3,664 persons reside in 2,492 dwelling units being an occupancy rate of 1.47 persons per dwelling unit. The Calgary occupancy rate is 2.64 persons per dwelling unit.

Approximately 90% of all the dwellings in Mission are apartment type dwellings, and fewer than 5% are single detached type dwellings. In Calgary, single detached dwellings are the predominate type of dwelling at 59.6%, while apartment type dwellings rests at 19.4%. It is anticipated that continued redevelopment pressures will result in the loss of single detached dwellings in Mission.

Table 6.0 Dwelling Types in Calgary and Mission

	Mission		Calljary	
	Number	Percent	Number	Percent
Single Detached	115	4.6/o	194,362	59.6%
Semi Detached	4	0.2%	21,241	6.5%
Townhouse	21	0.8%	34,241	10.5%
Apartment, Detached Duplex	2,261	90.7%	63.299	19.4%
Other	91	3.7%	12,925	4.0%
Total Occupied Dwellings	2,492	100.0%	326,068	100.0%
Source: City of Calgary, Civic Census. 2000.				

6.0 Education

Table 7.0 Education Level in Calgary and Mission indicates that population in Mission is slightly more educated than the Calgary average. Less than 18% have less than a High School Diploma versus the City's 27%, while 34.2% have Other Non-University education or had been to University without degree versus the City's 27.2% and 12.8% respectively. It is believed that educated people have a greater propensity to enroll in continuing education programs and classes. The level of education is also an indicator that which is related to the frequency of Internet usage. Individuals that have college or university education tend to access the Internet more frequently than those individuals without post-secondary education.

Table 7.0 Education Level in Calgary and Mission

	Mission		Calgary	
	Number	**Percent**	**Number**	**Percent**
Less than High School	585	18.0%	162,110	27.0%
High School Graduation	375	11.6%	68,240	11.4%
Trades Certificate	35	1.1%	17,140	2.9%
Other Non-University	1,110	34.2%	163,480	27.2%
University without Degree	525	16.2%	76,765	12.8%
University with Degree	610	18.8%	112,400	18.7%
Total Population Aged 15-), **Not Registered in School**	3,245	100.0%	600,130	100.0%
Source: City of Calgary, Civic Census, 2000.				

7.0 Median Income

Table 8.0 Median Income in Calgary and Mission indicates a decrease in the overall median income for both Calgary and Mission from 1990 to 1995. On average the median income for Mission is approximately $15,000 lower than Calgary. Income is considered to be a factor in the level of adoption for technology. Individuals with higher incomes can typically afford better computers and access to the Internet than individuals with lower incomes.

Table 8.0 Median Income in Calgary and Mission

	1990	1995	**% Change**
Mission	$30,201	$29,859	-1.1%
Calgary	$49,744	$45,777	-8.0%
Source. Statistics Canada. Census of Canada. 1996.			

8.0 Land Use Districts

The predominant land use districts within Mission are C-3 (Genera! Commercial District), RM-5 (Residential Medium Density Multi-Dwelling District) and RM-6 (Residential High Density Multi-Dwelling District). The remainder of the land use districts within the community include C-2 (General Commercial District), RM-7 (Residential High Density Multi-Dwelling District), PE (Public Park, School And Recreation District) and DC (Direct Control) districts.

Table 9.0 Land Use Districts - Calgary Land Use Bylaw 2P80

Section	Land Use District	Purpose
Section 30	RM-5 Residential Medium Density Multi-Dwelling District	The purpose of this district is to provide for a variety of low profile residential building forms in a medium density range.
Section 31	RM-6 Residential High Density Multi-Dwelling District	The purpose of this district is to provide for high density, medium profile apartment development.
Section 32	RM-7 Residential High Density Multi-Dwelling District	The purpose of this district is to provide for high profile, high-density residential buildings.
Section 36	C-2 General Commercial Districts	The purpose of this district is to provide for a wide variety of retail commercial and personal service uses at moderate intensity that serve areas beyond the surrounding community.
Section 37	C-3 General Commercial Districts	The purpose of this district is to provide for a wide variety of retail commercial and personal service uses at high intensity.
Section 51	PE Public Park, School And Recreation District	The purpose of this district is to provide for educational, recreational and conservation uses.
Section 50	DC Direct Control District	The purpose of this district is to provide for developments that, due to their unique characteristics, innovative ideas or because of unusual site constraints, require specific regulations unavailable in other land use districts.
Source: Calgary Land Use Bylaw 2P80, Office Consolidation 2001.		

Figure 10: Land Use Map shown on the next page illustrates that the Commercial Land Use Districts are concentrated along 4 Street and 17 Avenue SW. Institutional uses are concentrated adjacent to the Elbow River north of 21 Avenue SW and south of Holy Cross Lane. The remainder of the community is either designed with Direct Control Land Use Districts or Residential Land Use Districts.

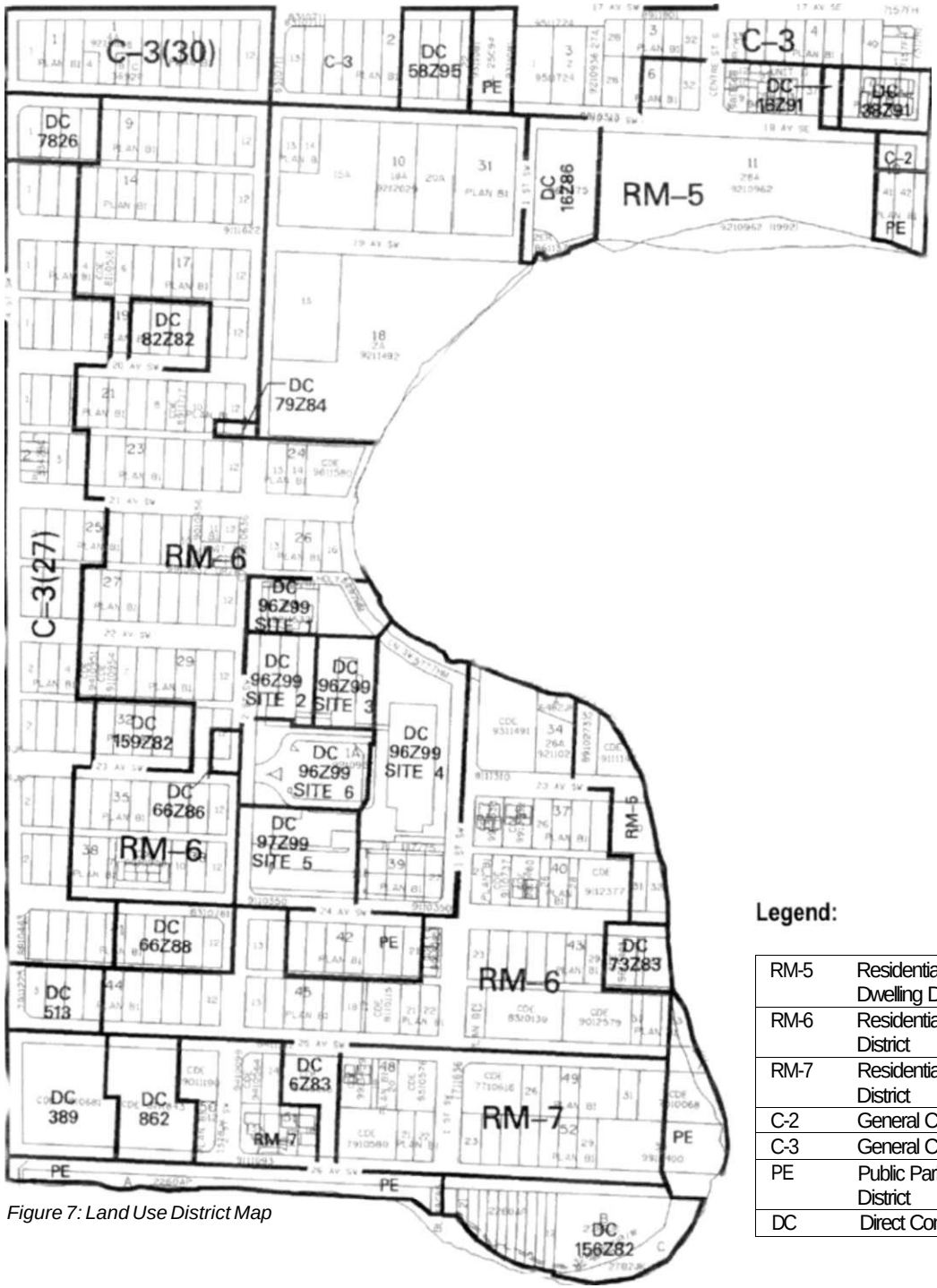

Figure 7: Land Use District Map

Legend:

RM-5	Residential Medium Density Multi-Dwelling District
RM-6	Residential High Density Multi-Dwelling District
RM-7	Residential High Density Multi-Dwelling District
C-2	General Commercial Districts
C-3	General Commercial Districts
PE	Public Park, School And Recreation District
DC	Direct Control District

9.0 Open Spaces

Since the 1950s, the City has been authorized through the Alberta Municipal Government Act to require a landowner to provide up to 10% of the land within a proposed subdivision for parks and school sites. This provision of Reserve can be provided as land, as money in place of land, or as any combination of both. Sites that are designated as municipal reserve, school reserve, or municipal and school reserve may be used only for a public park; a public recreation area; school authority purposes; and to separate areas of land that are used for different purposes. All school authorities must return Reserve school sites to the City once they are to be determined as permanent surplus to the school board's needs.

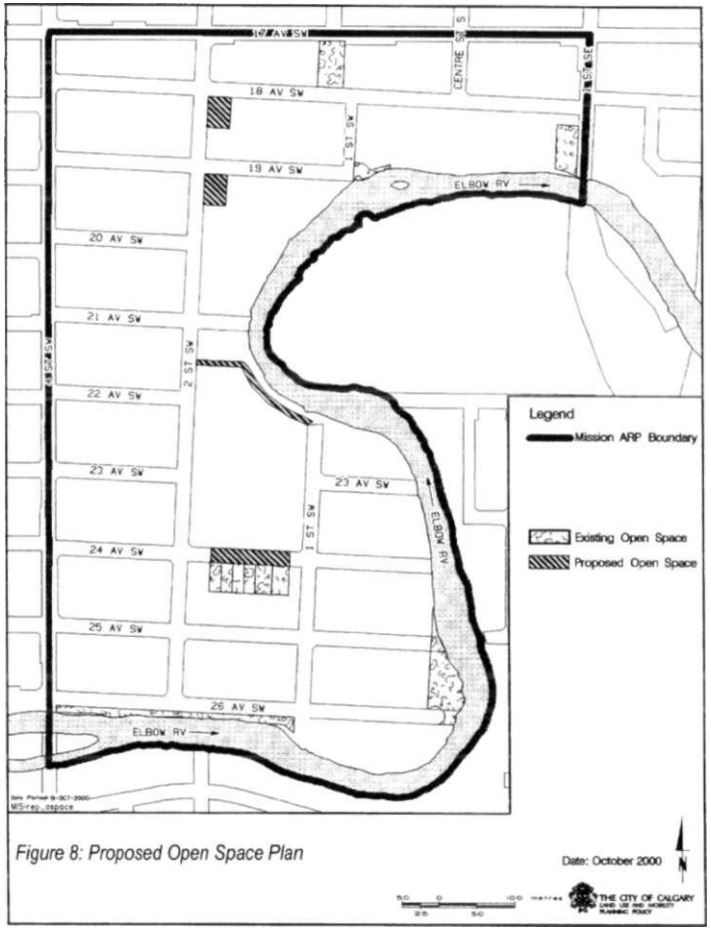

Figure 8: Proposed Open Space Plan

The largest park is 0.4 hectares (1.0 acre) and is located on 24 Avenue SW and has children play equipment and community garden. Fragmented linear open space exists along the bank of the Elbow River at the south end of the community and is approximately 0.65 hectares (1.6 acres) and provides for connection for cycling, jogging, and strolling. Open space area comprising of 0.15 hectares (0.4 acres) also exists along the Elbow River at the north end of the community adjacent to 1 Street SW. Two schools, St. Monica's and St. Mary's are private property and are not available for community use.

Lindsay Park and the Calgary Stampede Grounds are located east of the community and are also within walking distance. Lindsay Park is located directly across the Elbow River and comprises approximately 9.7 hectares (24 acres) of land. Direct access to Lindsay Park is currently available from the C.N. Bridge and a pedestrian bridge from 22 Avenue.

The Community of Mission currently has about 1.3 hectares of recreational open space. This calculation does not include St. Mary's High School and St. Monica's School, since these sites do not allow for public access. The present ratio of recreational open space to population (not including the schools) is 0.35 hectares/1000 people.

According to the Inner City Open Space Study (1994), Mission is considered an Inner City Adult Prototype where less than 5% of the population is under 15 years of age. Based on the guidelines in the study, the recommended provision of recreational open space for Mission should be between 0.5 and 0.7 hectares/1000 people. As a result, the Community of Mission is deficient in recreational open space.

The Inner City Open Space Study (1994), states that, "not all open space parcels can easily accommodate primary active recreation activities, as well as serve passive recreation and aesthetic functions, sensitive site-specific designs must be evolved to allow the broadest spectrum of user needs to be satisfied." Therefore, it is conceivable that the City of Calgary could acquire the former St. Mary's school site as a synergy centre for the purposes of maintaining open space and amenities within Mission for the greater surrounding community.

The Inner City Plan (1979) also suggests that Area Redevelopment Plans should contain recommendations for specific uses of school sites declared surplus for educational purposes. An example of this can be found in the Cliff Bungalow Area Redevelopment Plan (1993), it recommends that the City acquire the Cliff Bungalow School site for open space, if the school is declared surplus by the Calgary Board of Education. Since the drafting of the Cliff Bungalow Area Redevelopment Plan, the Cliff Bungalow School site has been acquired by the City of Calgary.

10.0 Transportation System

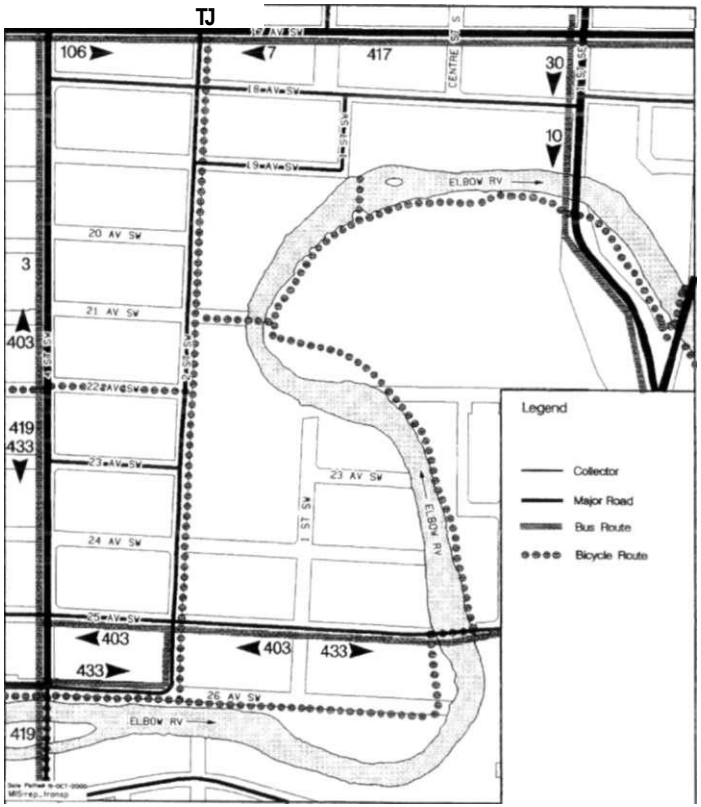

Figure 9: Proposed Transportation Network.

The major roads in Mission are 1 Street SE (MacLeod Trail), 2 Street, 4 Street, 17 Avenue, 25 Avenue, and 26 Avenue. The bus routes and bus stops can be found on all the major roads with the exception of 2 Street. The Elbow River Pathway System along the Elbow River and 2 Street are the recognized Bicycle Routes that serve the Community of Mission. The existing network of roads, bus, and bicycle routes serve the Community of Mission very well. The exceptions are that 2 Street and a portion of 25 Avenue is both one-ways.

The Inner City Transportation Study, approved by Calgary Council in 2000, provides recommends to the Mission transportation system and is scheduled for implementation sometime in 2002. Some of the recommendations for Mission are summarized in *Table 10: Transportation System Recommendations.*

Table 10: Transportation System Recommendations

Street/Avenue	Road Category	Vehicles per day	Recommendations
4 Street	Secondary Routes	10, 000 to 30,000	Supports main routes by connecting to or being a continuation and also serve a mix of through and local traffic.
2 Street between 17 and 26 Avenues & 25 and 26 Avenues between 2 and 4 Streets	Minor Collectors	1,000 to 7,000	Have residential frontage and on street parking. Recommended to be converted to 2-way traffic.
2 Street between 17 and 26 Avenues	Minor Collectors	1,000 to 7,000	Recommended becoming an on-street cycle route.

Source: City ol Calgary, Inner City Transportation Study, 2000.

11.0 Community and Social Development

The Community of Mission is known for its active community and social life. The Cliff Bungalow-Mission Community Association regularly sponsors block parties, Lilac Festival, and educational courses in gardening, and composting. The Mission Statement (formerly Free Press) is the community newsletter, which is published every two months by the Cliff Bungalow-Mission Community Association.

Each spring, The Lilac Festival is hosted on 4 Street and it attracts 10,000s of people from in and around Calgary. During the event 4 Street is closed from 26 Avenue to 17 Avenue for food, craft, art, and music venues. Attendance at the Lilac Festival is free and continues to grow each year.

12.0 Conclusion

The Community of Mission is an inner city community that has a growing potential to support a synergy centre. The current population is approximately 3,700 persons and based on existing land use the community's population at full development could be 8,000 - 10,000 persons. Within the total population range it is anticipated that 1-2% of the working population (20-54 age cohort) would benefit from a synergy centre. This represents approximately 118-145 persons within Mission. In order to increase the number of persons who would benefit from a synergy centre the catchment area would expand to include adjacent communities and people commuting 10 minutes by car or public transportation. Adoption of telecommuting and teleworking initiatives will likely translate to an increase of persons who would benefit from a synergy centre, particularly if they do not have adequate space within their residence.

Other community characteristics of Mission are:

- a large percentage of the population has some level of post-secondary education, which is one attribute that has been linked with adoption of technology;
- majority of the population is considered to be youthful and is also considered to be more apt to adopt technology; and
- a significant percentage of the dwelling types are apartment style that are typically smaller in size and less conducive for telecommuting or small office home offices.

Chapter 5 - Calgary Planning Documents

1.0 introduction

It is anticipated that communities around the globe will continue to be revitalized and redefined through the adoption and integration of what has been termed the "enabling infrastructure," this also applies to the City of Calgary. This chapter provides a brief summary of the main planning and policy documents which guide and influence development in the City of Calgary. The main documents include The Calgary Plan, Go Plan, Inner City Plan 1979, Calgary Land Use Bylaw, and Draft Mission Area Redevelopment Plan. These documents also contain the essential mechanisms and tools that enable urban planners in the City of Calgary to utilize and embrace digital telecommunications in all planning projects.

Notwithstanding the openness and flexibility that is exercised in the interpretation of these documents planners should also consider strengthening the recommendations and policies for digital telecommunications initiatives, such as synergy centres and telecommuting within residential neighbourhoods.

2.0 The Calgary Plan

The Calgary Plan, municipal development plan, is the pre-eminent plan guiding growth and development within The City of Calgary. The Calgary Plan (the Plan) provides a strategic and city-wide framework for guiding more detailed plans and policies, which are incorporated and implemented through local community plans, policy documents and municipal projects. The Plan also addresses land use, development, and transportation and includes policies and goals that provide the municipality the planning tools to address matters related to the health of the environment, the vitality of the economy, and social well-being.

The vision statement for the Plan suggests that Calgarians will be living closer to where we work, and experience intensification of older communities, and changes in the way we work. The Plan makes reference to Calgary's position as a key player within the global economy as a result of its central location in the west as a major distribution hub for goods and services destined for markets in Western Canada, the Pacific Northwest, and internationally. However, the Calgary Plan neglects to mention that Calgary is also considered to be one of the most wired cities in North America and is becoming Canada's biggest technology and innovation center.

The exercise for this chapter is to attempt to summarize the intent of the Calgary Plan and suggest how the development of synergy centres is supported and supports the goals and policies within the Calgary Plan. Goals and policies within Part 2 of the Calgary Plan - Healthy Environments, Growth Strategy, and Healthy Communities are reviewed in the context of the proposed synergy centre concept (see Appendix C).

Overall, the Calgary Plan is a general planning document that appears to allow for the integration of synergy centres at the community scale, city scale, and regional scale. The development and integration of synergy centres within residential neighborhoods appears to address some of the underlying objectives related to the environment. Within this land use and mobility context the integration of synergy centres would enable the City to realize each of its growth strategy objectives. The synergy centre and its partnering concept could also be conceived with the specific purpose of providing accessible social services and opportunities in an equitable way as well as providing diversification and range of employment opportunities to all Calgarians. Some of my major criticisms of the Calgary Plan are that it does not identify or seek to address issues related to telecommunications as being a community interest and relies heavily on an age-old planning paradigm of planning the hard visible infrastructures.

3.0 Calgary Transportation Plan (GoPlan)

The Calgary Transportation Plan encourages Calgarians to live and work within their community, while having less demand on the transportation network. Telecommuting is considering one of many possible alternatives and solutions. In addition, linking transportation and land use planning is a cornerstone of the GoPlan's strategic long range planning effort. In conclusion GoPlan suggests that as Calgary approaches the population threshold of 1.25 million, new directions will be warranted to reduce the dependency on the private automobile.

GoPlan objectives suggest that all new suburban communities should incorporate a pedestrian-friendly design, and a greater mix of compatible local services, and amenities. It also suggests a gradual and sensitive intensification of existing neighbourhoods and the downtown must continue to have an integrated balance of activities, jobs, housing, cultural events, and shopping.

Although synergy centres are not presented in the Calgary Transportation Plan there is a strong indication that these types of facilities could be used as a possible transportation alternative. Given the key land use policies and intent of the Calgary

Transportation Plan it is suggested that simply building more transportation infrastructure alone is not enough to effectively and efficiently management the projected traffic demands by the year 2024.

The development and integration of synergy centres within new and existing residential neighbourhoods could allow for new opportunities in addressing the growing number of transportation issues. For example, a network of synergy centres developed within Calgary combined with other transportation initiatives could further support alternative modes of transportation and transit. Instead of moving people and products in the physical sense the synergy centre could enable people to work and live within their community as teleworkers, telecommuters, or simply as small entrepreneurial businesses moving data and information over networks. Furthermore, if people choose to work and live differently, then this could influence the design and redesign of communities in Calgary.

It is also anticipated that the development of synergy centres throughout the City could contribute to an increase in the overall carrying capacity of the existing infrastructure by providing continued and valuable live work options to all Calgarians.

4.0 The Calgary Land Use Bylaw 2P80

The Calgary Land Use Bylaw controls the land use redesignation and home occupation permit approval processes in Calgary. It controls the use of all land in the City of Calgary. The Calgary Land Use Bylaw is also an important tool for implementing the policies within the Municipal Development Plan, Area Structure Plans, Area Redevelopment Plans, and other policy studies. The Land Use Bylaw regulates the type and mix of housing; the location and type of shops and services; and the development potential of each property. Within the Calgary Land Use Bylaw, synergy centres and other digital telecommunication initiatives such as telecommuting and teleworking in small office home offices are possible.

4.1 Home Occupations

Within the Calgary Land Use Bylaw a Home Occupation - Class 1 means an accessory use of a dwelling unit by a resident for a small-scale business which is incidental to the primary use as a residence. Home Occupation - Class 2 means an accessory use of a dwelling unit or private garage by a resident for a small-scale business that is incidental to the primary use as a residence.

The requirements for both types of Home Occupations as described by the Calgary Land Use Bylaw are provided (see Appendix D, page 97).

The requirements for Home Occupations have been established in order to minimize and regulate the impact of these types of uses within a community. Unfortunately, there are situations where the Home Occupation is not applied for or registered with the municipality. These situations typically translate into complaints received by the municipality regarding a Home Occupation in a neighbourhood. In the City of Calgary, the Bylaw Enforcement Office will send a representative to investigate and to enforce the land use bylaw. A person operating a Home Occupation without planning approval or a registered business license can be fined by the City of Calgary.

The number of illegal Home Occupations in the City of Calgary is difficult to determine, since the municipality will have no record or permit listed in their database. Illegal Home Occupations are usually discovered when reported by a neighbour. The City of Calgary is currently working to improve it's ability to monitor and regulate Home Occupations and illegal Home Occupations. The overall accuracy of monitoring illegal Home Occupations is anticipated to improve when income tax and population census information is linked to the City's databases.

Notwithstanding the development of illegal Home Occupations, the Calgary Land Use By-law also provides for the development of synergy centres. For the purposes of this study a synergy centre is an alternative to working from home.

4.2 Possible Land Use Districts for a Synergy Centre

Public or quasi-public building means a building which is available to the public for the purpose of assembly, instruction, culture or community activity, including but not limited to, a church, a library, a museum, an art gallery and the recreational, social, or educational activities of a public group or organization. For the purposes of this study, a synergy centre appears to fit the category of Public or quasi-public building (see Appendix D, page 98).

It appears that synergy centres could be interpreted as a public or quasi-public building. The Calgary Land Use Bylaw recognizes and permits the development of public or quasi-public buildings in a variety of land use districts. Therefore, it is assumed that synergy centres should also be permitted as discretionary uses within the same land use districts. These land use districts include residential, commercial, industrial, open space, and special districts, all of which are possible within a residential community. The former St. Mary's School site is designated as RM-5 Residential Medium Density Multi-Dwelling District which is included in the list provided above.

5.0 **Inner City Plan 1979**

pressure to change. This change was identified as a direct result of population growth, intrusion of transportation arteries, changing demographics, and uncertainty as to the future role and likelihood of redevelopment in specific areas. The Inner City Plan recognized that there were some stable communities within the inner city, while others were struggling to maintain a livable environment and some aspect of neighborhood identity.

The goals of the Inner City Plan (1979) are as follows:

- The accommodation of a larger inner city population;
- The maintenance of a diversity of lifestyle alternatives,
- Housing choices and household types within the inner city, the increased stability of inner city neighborhoods;
- An attractive and livable inner city environment; and
- The accommodation of a variety of commercial strips and nodes within the inner city (The City of Calgary, 1979).

A summary of the criteria, recommendations, and specific guidelines for the Community of Mission are provided (see Appendix E). The Inner City Plan (1979) recognizes that open space should be improved in the north part of the Community of Mission, being north of 25 Avenue. The Inner City Plan (1979) also suggests that open space is an all-encompassing term, which refers to a variety of spaces and facilities serving distinctly different needs.

The recommendations for local open space and facility guidelines in the Inner City Plan (1979) could be implemented in the Draft Mission Area Redevelopment Plan in order to acquire the former St. Mary's School for the purposes of a community synergy centre. The Society for the Preservation and Restoration of St. Mary's School (1909) has been working with the Community Association, City of Calgary, and Province of Alberta to advocate the ultimate recognition, protection and re-use for the 1909 section of the old St. Mary's School with some success. It is clear that members of the community and greater Calgary agree that the former St. Mary's School should be protected and re-used, which conforms to The Inner City Plan recommendations for local open space and facility guidelines. The proposed synergy centre concept could be used to advance the groups and individuals within the community who are interested in reusing and possibly maintaining the St. Mary's school as a quasi-public facility for the greater community.

6.0 **Mission Area Redevelopment Plan**

City of Calgary Council approved the current Mission Area Redevelopment Plan in 1S82. For this study, the Mission ARP (1982) was reviewed but will not be included. Instead, The Revised Mission Area Redevelopment Plan (draft) which was released to the public in October 2000 was reviewed for the purposes of this study.

As a supplement to the Land Use Bylaw the Area Redevelopment Plan provides direction within which the discretion of the Approving authority should be exercised for a particular community. The Land Use Bylaw applies uniformly throughout the City while the Area Redevelopment Plan is intended to provide a community orientation to the district uses and rules. Like all Area Redevelopment Plans the boundaries, goals, land uses, open space and recreation facilities, transportation, and public improvements are established and/or defined within a community context.

The Revised Mission Area Redevelopment Plan provides direction for future development within the community. Its policies and regulations provide the mechanisms and understanding of the intended development of the community. The Revised Mission Area Redevelopment Plan also suggests that there is insufficient usable open space in the north part of the community. It also notes that the two schools, St. Monica's and St. Mary's are private property and are not available for community use. A policy in the Revised Mission Area Redevelopment Plan suggests that the amount and distribution of open space consistent with the guidelines in the Inner City Open Space Study (1994) should be achieved in Mission.

7.0 Conclusion

In general the Calgary planning documents appear to be flexible in interpretation to allow for the development of synergy centres and other telecommunications initiatives such as telecommuting and small office home office developments. However, the Calgary Plan and the Revised Mission Area Redevelopment Plan in particular fall short of providing adequate support for digital telecommunications and initiatives. This should be of concern if we assume that the adoption and integration of digital telecommunications is becoming an increasingly critical factor in maintaining quality of life for residents in Calgary. The opportunity to include references to digital telecommunications exists when the City of Calgary revisits these documents. That opportunity exists now for the Mission Area Redevelopment Plan, which is currently under review.

The former St. Mary's School site should be acquired for a synergy centre as a means of maintaining open space and amenities within Mission and greater surrounding area. To facilitate the development of a synergy centre in Mission, the Revised Mission Area Redevelopment Plan should be amended to include a new section on Digital Telecommunications Initiatives. This new section should include a brief introduction, objectives, policies, and implementation of digital telecommunications initiatives and identify potential sites and areas within the Community of Mission. Digital telecommunications initiatives should include at minimum telecommuting, small offices home offices, and a synergy centre.

Chapter 6 - Proposed Mission Synergy Centre

1.0 Introduction

As a demonstration project, this chapter proposes the design and function of the former St. Mary's School site as a synergy centre. The proposed synergy centre is designed to enable individuals to work, live, play, and learn within the Community of Mission. The broader intent also includes bringing the community residents together to build upon and enhance the existing networks that already exist and provide a technological means for citizens and community to access the global economy.

Figure W: Proposed Mission Synergy Centre

It is anticipated that as digital telecommunications improves and becomes more affordable more and more individuals will have the opportunity to work from an alternative working environment such as a small office home office and a synergy centre facility located within a residential community. Evidence is beginning to demonstrate that telecommuting and working from a community tele-center (synergy centre) appears to be gaining momentum as an alternative digital working environment.

Today, individuals have more choices and options for working. However, some of these choices include decisions of whether or not to operate a small office home office from their personal residence. In the inner city, space typically comes at a premium when compared to suburban space. Typically the area of a dwelling unit in the inner city is smaller than the area of a dwelling unit found in suburbia. As a result, inner city residents may not have the same opportunities or capabilities to support telecommuting and SOHO developments based on dwelling type and size. Therefore, this study suggests that spaces and places for these types of activities should be provided within the Community of Mission. This place could be a community synergy centre that supports telecommuting and teleworking activities outside of the home within a residential neighborhood.

2.0 Site Selection

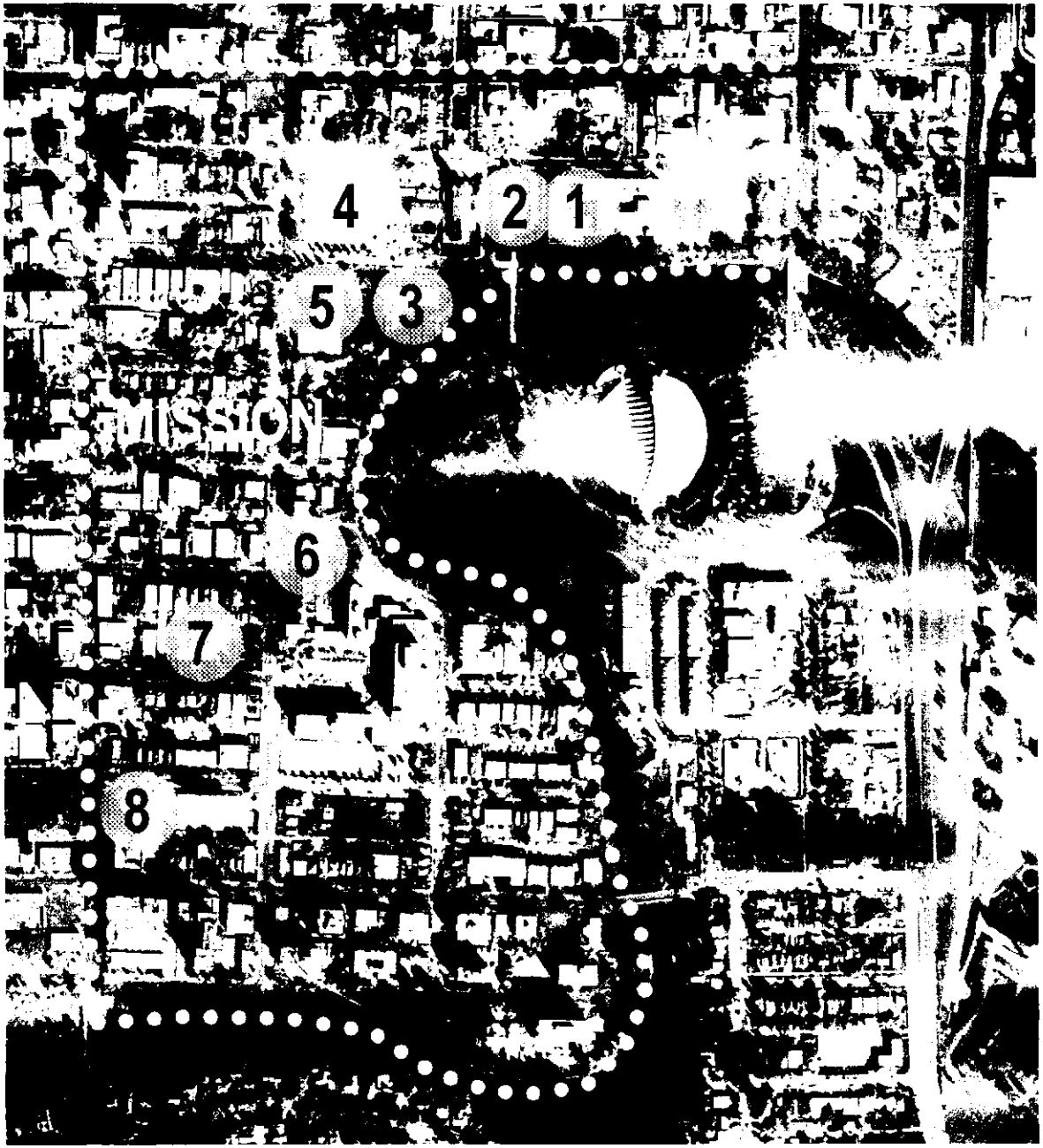

Figure 11: Aerial Photographic of Mission

For the purpose of this project only sites within the Community of Mission were considered. In total eight (8) possible synergy sites were identified and are shown in the aerial photograph of Mission. A preliminary site selection and analysis is shown on the next page.

Of the eight (8) possible sites identified, the former St. Mary's School appeared to be the most desirable site with the greatest potential relative to the other sites identified. This does not preclude the possibility of the synergy centre locating in existing or proposed commercial developments along 4 Street and 17 Avenue, proposed mixed residential developments, and/or the Holy Cross Centre (former Holy Cross Hospital).

Fiaure 12: St. Mary's School /former)

21 Site Selection Analysis

Table 11: Site Selection

Number	Site	Building Significance	Availability of Building	Floor Area	Accessibility of Building	Location	Development Potential	Total
1	St. Mary's High School	2	4	6	9	7	4	33
2	CPR Building	9	4	4	8	8	7	40
3	Sacred Heart Convent	8	4	7	8	9	6	41
4	St. Monica's School	1	4	6	9	9	4	33
5	Former St. Mary's School	9	7	9	5	9	9	48
6	Holy Cross Hospital	7	6	8	8	7	7	43
7	Medical Building	2	5	5	8	6	5	35
8	CHRA Parking Lot	0	0	9	0	6	9	24

The selection criteria was limited to building significance, availability of building, floor area, accessibility of building, location, and development potential. The assigned values for each site were subjective and based on current knowledge of the site, 0=least significant and 10=most significant.

Building Significance	Meaning historical significance of the building or site.
Availability of Building	In most cases the buildings are occupied and the owners/tenants have no real intent of moving or relocating making the building available. However, depending on the size or magnitude of the intervention, in some situations the building could be made available after hours.
Floor Area	The floor area of the building and potential for that area being available for synergy centre purposes.
Accessibility of Building	Given building codes and standards is the building accessible to all people with varying abilities.
Location	Walking distance to public transportation nodes, amenities, and population.
Development Potential	Meaning the opportunity for having the greatest positive impact on the community through (re)development and the opportunity for enhancing the surrounding area.

Both strategically and aesthetically, the former St. Mary's School site is a highly visible landmark within the Community of Mission. The building has character and historical significance, both of which could be maintained through redevelopment. The building has more than one level and is large enough to accommodate a variety of uses.

Relative to the other possible buildings within the immediate area, this particular building has the greatest potential for reinforcing and redefining the Community of Mission. Firstly, the location of the former St. Mary's School site is strategic, since it provides the opportunity to serve the north portion of the community as part of the open space requirement identified in the Inner City Open Space Study. Secondly, should the Convent be redeveloped as a convention or meeting centre then the redevelopment of the former St. Mary's School site as a synergy centre could provide a linkage between the Convent and the surrounding residential component of the community. Thirdly, due to its accessibility and location to Lindsay Park, the former St. Mary's School site could also serve as a place for education, meetings, and presentations related to "Health and Wellness" in Lindsay Park's expansion program. Fourthly, the area immediately north of the former St. Mary's School site, which is currently used as surface parking for the Convent and St. Monica's school should also be developed as the synergy centre's New Media Park. This New Media Park could be envisioned as a "connected" park and below grade could be developed as an underground parkade that could serve the surrounding public and private facilities as overflow parking.

3.0 Building Upon Community

Redeveloping the former St. Mary's School site is also an opportunity to build upon the existing physical fabric of the community. This would allow the site to continue to evolve and be a part of the history through its continued transformation and change in use. As well, the synergy centre could become an integral part of the community by reinvesting revenue generated in the facility back into the community. This could be achieved through coupons, tickets, prizes that are specific to the amenities located within the surrounding communities.

Building upon the community could also be achieved by developing the synergy centre as the physical gateway or the stepping-stone to access the global economy. From a physical sense and location within the community it could be used to generate new connections and relationships throughout the Community of Mission

From a symbolic, perspective, the transformation process by maintaining the historical significance of the St. Mary's School facade also represents another possibility of building upon community. This could be accomplished by constructing a glass box around the historical facade protecting it from the natural elements, similarly to the music theatre in Barcelona. The synergy centre could provide for entirely new purposes that could be viewed from local, regional, national, and international perspectives as a symbolic icon of the community. More importantly, the redevelopment of the former St. Mary's School as a synergy centre could become representative of the place for ideas, vision, and technology in the Community of Mission.

Figure 13: Barcelona I Music Theatre

3.1 History & Historical Significance of St. Mary's School

This part of the study was included in order to suggest that one possible means of maintaining the history and historical significance of the former St. Mary' School site is to allow it to continue to evolve as a synergy centre. The following paragraphs provide a historical summary of the highlights and evolution of the former St. Mary's School site as reported by Harry M.Sanders (1998):

St. Mary's School was built in 1909 and it is both the original and oldest purposed-built Catholic school in the City of Calgary. The school itself was established in 1885, and its early history was closely linked to the Roman Catholic presence in the area.

During Calgary's pre-World War I boom enrolment at St. Mary's School was the school's greatest issue. In January 1909, Architect James O'Gara was hired to design the existing building, with Hodgson and Bates as associate architects. St. Mary' School opened in January 1910 and was marveled as very ornamental and spacious building. In 1915 the Board of trustees ruled out adding another floor in the building in order to accommodate the increasing enrolment. In 1918 senior boys' classes were relocated to separate facility, creating St. Mary's Cathedral College for boys (later renamed St. Mary's Boys' School). At this point the old school effectively again became St. Mary's Girls' School.

In 1935 the school was overcrowded again, however no major building expansion took place during the Great Depression or World War II (1939-1945). Instead internal alterations occurred during the 1930s and 1940s to accommodate the larger number of students.

In the 1950s The Catholic School Board concentrated on building both elementary and junior high school facilities to serve the growing demand for schooling in the area. Beginning in 1957 the St. Mary's Boys' School was built on 18 Avenue SW, followed by the construction of two large additions to the existing St. Mary's Girls' School in 1958-1959. The new wings at the girls' school - designed by architects Rule, Wynn & Rule - included classrooms and a gymnasium, library and cafeteria.

In 1969 the former St. Mary's Girls' School was converted into a junior high school and renamed St. Martin de Porres. Administratively, St. Martin de Porres became part of St. Mary's Community School, which included a high school component (St. Mary's High School), a junior high (St. Martin de Porres), and an elementary (St. Monica's).

By the late 1970s, enrolment at St. Mary's Community School was in decline. The Catholic School Board closed St. Martin de Porres School (former St. Mary's) in 1979 and transferred its classes to nearby St. Monica's. From about 1979-1995 the old St. Mary's Girls' School was rented to the Roman Catholic Diocese of Calgary for use as the Catholic Pastoral Centre. Since then the existing building has been vacant when the Pastoral Centre moved and now the building is being considered for demolition.

This brief historical account of the former St. Mary's School demonstrates that utility and versatility that this building can offer to the surrounding Community of Mission. Today, the Catholic School Board and The City of Calgary are debating the fate of this building. The re-purposing the building as a synergy could be possible through extensive renovations and change in use.

3.2 Renovation & Reuse

"In the 1920s one was forced to do away with nineteenth-century tendencies, when one had to begin again from scratch. Today the situation is completely different. We stand at the beginning of a new tradition. One need no longer destroy what the preceding generation accomplished, but one has to expand it (Giedion, 1955)."

The former St. Mary's School building has its advantages such as high ceilings and historical significance. Firstly, buildings prior to the 1950s typically have high ceilings and can easily accommodate rewiring and new modern infrastructure. Secondly, capitalizing on the historical significance we have the opportunity to reinforce the historical integrity of the community and provide space for various activities and amenities demanded by the community.

From a post-modern perspective, the approach would be to redevelop the former St. Mary's School as a synergy centre and preserve as much as possible and reuse that which is practical. The focus of redeveloping this facility would be the integration of digital telecommunications and computer technology. The addition of this new layer of technology could be the intervention that would facilitate the continued evolution of the former St. Mary's School.

Figure 18: New Layer of Technology Intervention

3.3 Immediate Area

Figure 19: View of Downtown Calgary

The downtown is within walking distance from the former St. Mary's School site. The photo is taken from one of the two pedestrian bridges that connect the community of Mission and Lindsay Park looking north towards the downtown skyline. Several types of amenities are within walking distance of the proposed synergy centre, such as businesses along 17 Avenue and 4 Street SW, Stampede Grounds, Lindsay Park, Elbow River, and a number of satellite education facilities housed in the Holy Cross Centre.

The immediate area appears to be more cosmopolitan than other parts of Calgary and also supports a wide and diverse range of activities, amenities, and destinations. The introduction and integration of a synergy centre is anticipated to add to this diversity and reinforce this part of the city as a destination for activity, culture, education, and employment. The synergy centre is also intended to enhance the relationship between existing facilities/amenities and provide both physical and digital linkages to other parts of the community and globe.

Figure 20: InterVisual, 4 Street & 19 Avenue SW

Two major firms, IBM (2 Street & 12 Avenue SW) and InterVisual (4 Street & 19 Avenue SW), have relocated their Calgary offices to this part of the city and are both within a ten-minute walk from the former St. Mary's School site. The flexibility of its existing older buildings and attractiveness of the Community of Mission lured InterVisual into a former medical building along 4 Street SW that has been under utilized and largely vacant since the closure of the Holy Cross hospital. The site selection criteria used by InterVisual in relocating its Calgary office are listed below:

- Environments that contribute to attracting and retaining employees, that encourages them to work as a team;
- A place with a cafe, with places to go after work for a drink, or entertainment, possibly a health club; and
- Keen on green space and trees (Real Direction, 1999).

Figure 21: View of Lindsay Park

Lindsay Park Recreation Centre I s a regional public athletic facility and park accessible from the proposed synergy centre via two pedestrian bridges. As previously mentioned, the synergy centre could provide "Health and Wellness" programs and classes on behalf of Lindsay Park. The physical link and connection between the two facilities also needs to be reinforced with directional signage and corridor improvements.

If the convent is utilized as a conference centre, the integration of a synergy centre would be a tremendous addition to facilitate this area as a conference/meeting destination. If this is the case every effort should be taken to secure the parcel to the south of the synergy centre for open space. This existing surface parking lot would be removed and replaced with an underground parkade. It would be designed to satisfy the parking requirements for the synergy centre, convent, Lindsay Park, and other uses in the immediate area.

3.4 Regional Impact

One can only speculate that the synergy centre will provide an efficient means of enabling growth and development within the regional context, particularly if there is a network of synergy centres. The synergy centre network could be located within walking distance or integrated into existing and proposed LRT stations located throughout Calgary. Within this regional community network the identity of each centre would be unique and representative of their respective areas. Ideally each synergy centre could take on the characteristics of the demands in their respective communities, linked by common interface and public transit. The intent would be to ensure that all users could access their information from multiple sites located throughout the City through "smart" card technology.

Figure 22: Victoria-Stampede LRT

The adjacent photos were taken of the two LRT stations, which are both within a 10-minute walk of the proposed synergy centre in the Community of Mission. The Victoria-Stampede LRT Station is located near the intersection of 18 Avenue SW and Macleod Trail SW. The Erlton-Stampede LRT Station is located near the intersection of 25 Avenue SW and Macleod Trail SW. In addition, excellent access to an extensive bus network and Calgary Regional Pathway System also exists within a 5 minute or less walking distance from the proposed synergy centre. Notwithstanding the arguments for redeveloping the St. Mary's School as a synergy centre, the two LRT stations have potential to incorporate a synergy centre component with a redesign of either station. Of the two locations, the Erlton-Stampede LRT Station appears to have more physical space to accommodate a synergy centre component than the Victoria-Stampede LRT Station.

Figure 23: Erlton-Stampede LRT

3.5 International Implications

The integration of a synergy centre within a residential neighborhood is also intended to attract the interests of large corporations, local and abroad, as a means to provide potential clients and employees the opportunity to participate in the growing international teleworking component of the global economy.

High-speed Internet access and personalized (custom) configurations for individual users is an attractive feature that is demanded by the traveling sales person, company employee, teleworker, and small office home office business. Providing access to a remote corporate network, ability to make last minute changes to proposals, customize documents, and submit daily invoices or timesheets are all possible from a synergy centre. These functions are attractive for the employees that are on the go and need to send or confirm recent updates of information with the main office without having to return to the office for changes that can easily be completed over the digital telecommunications network. The wireless capabilities of the synergy centre may even allow mobile employees within range to access third generation wireless technologies (high-speed wireless cellular services) that have not yet been deployed in Calgary.

From an international perspective the synergy centre may allow groups to collaborate on projects that demand more advanced computing and networks that would be otherwise out of reach for the typical teleworker or business executive to solve while working remotely. In other words, the synergy centre could provide the necessary support and capacity to facilitate collaborative working for the business traveler.

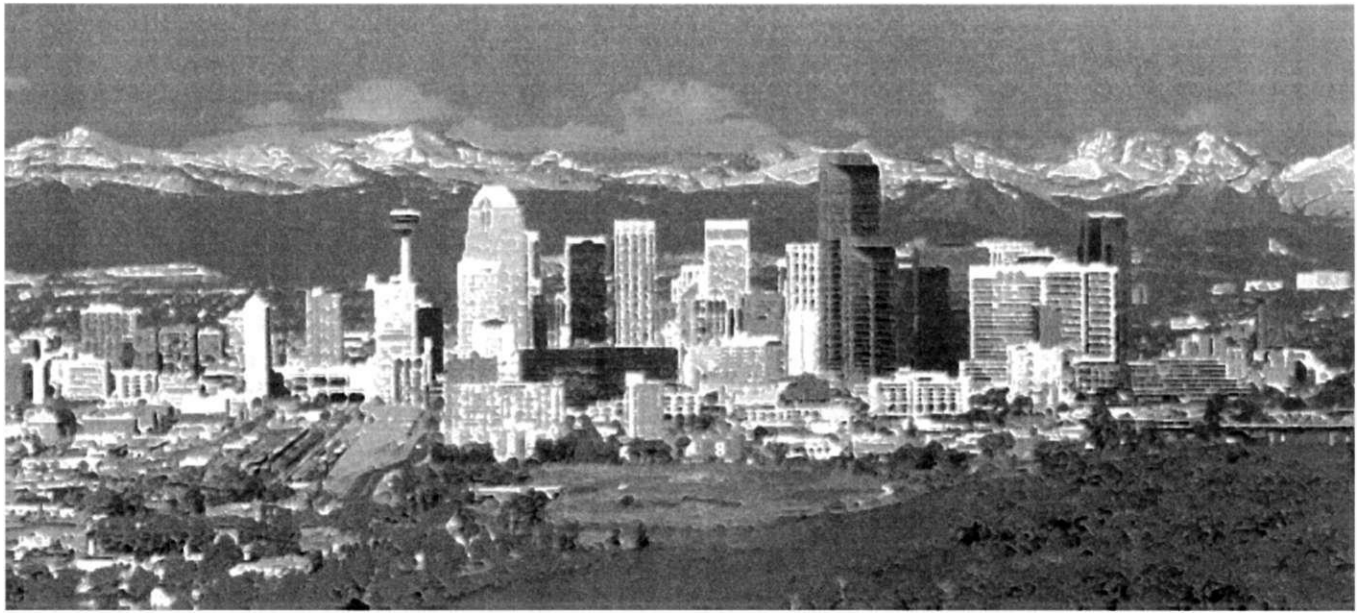

Figure 24: City of Calgary Skyline

4.0 The Proposed Facility

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some expertise that sustains its existence. However, given their expertise or core competency, this would indicate that certain tasks, services, or products are better suited or executed by others. It is conceivable that home offices could be better off if they could focus on the expert task at hand, while someone else manages their business, advertising, promotions, and digital telecommunications. The synergy centre is built to serve this purpose of various types of experts to share resources and talent pool to deliver the best product affordably and efficiently in a digital environment.

Initially, the synergy centre will be based on anticipated programs and activities through surveys and its design will inevitably evolve over time. Each user will have to fill out an application form, which will be used to determine the user's profile. As well the programs and configurations will be saved on a "smart" card, so that when the user logs onto a computer the computer and all peripheral devices will be configured to their specific user profile. These user profiles will improve the ease of use and hopefully reduce some of the problems associated with sharing equipment. Both windows and Mac environments will be available at the synergy centre to aid those individuals who prefer a specific operating environment.

The synergy centre will enable you to do something that you may not be able to do otherwise. For example, within the semi-private and private profiles users can reserve access to "super" computers to do specific tasks that would otherwise be too time consuming on the "standard" computers. Fee for service for these tasks will more than compensate for the desired outcome. The benefit to home office users, is that they would have access to very powerful computers and software to allow them to accept more demanding and interesting projects on a contract work basis.

The centre can also be used for meetings and presentations and other social type events, either in private meeting rooms, classroom environment, theatre, or simply over a cup of coffee in the common areas.

The synergy centre is also a facilitator. It will provide access to resources and equipment that will facilitate and enable those seeking to work in a professionally controlled environment.

4.1 Membership Profiles

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Public, Teleworker, and Business User Profiles.

For example, the synergy centre will maintain a minimum of 20 percent floor plan area for each of the user profiles as listed below, which leaves 40 percent of the remaining space for other services, amenities, and possible expansion:

Table 12: User Profiles

Public User Profile	**Teleworker User Profile**	**Business User Profile**
• Access to high speed Internet • Can attend public presentations in theatre or lecture rooms • Work areas will be available on first come first serve basis • Printing and copying facilities available for fee Help desk Cafeteria • Public bulletin boards for postings • Synergy centre community registration directory • No reservations available	Access to everything available to the public user Semi-private cubicles with desk, computer, and phone Shared printers, fax, scanners, plotters, and copiers Secured environment • Hourly, daily, weekly, monthly rates (paid in advance) Membership listing and web page to advertise • Communal meeting room, classroom, theatre/lecture room • 24 hr - fax, postal, and courier services • training and development (fee)	• Access and priority over public user and teleworker user profiles Private meeting rooms Secretarial services • Receptionist services • Parking passes for visitors • Advertising within centre • Technical help and assistance • Training and development (free) Secure and private office space Full reservations available • Monthly and Quarterly Rates (paid in installments) limited reservations available

"Smart" card technology will be utilized in the synergy centre for access and services available in the building. Call forwarding, programmed numbers and frequently called phone numbers, and other business preferences will be encoded on the "smart" card for those members who have access to teleworking and office space within the building.

The actual area of a synergy centre facility will be dependent upon the number of users and diversity of uses to be supported. As noted above, each user profile use should be provided space within the synergy centre facility. For example in a building of 50,000 sq.ft., each user profile would be provided 10,000 sq.ft. and the remaining 20,000 sq.ft would be provided for other services, amenities, and possible expansion.

4.2 **Stratification**

The term stratification will be used to describe the level of service through division (layering). The intent is to put in place the order and magnitude of products and services available to users who will be accessing the synergy centre. Stratification is a critical component in allowing the synergy centre to provide a level of service that best serves the three recognized user profiles.

The synergy centre is intended to reduce the barriers of entry by providing a tier user system through stratification. The public user will have access to a number of uses and activities within the synergy centre. The causal/telework user will have access to a greater variety of uses and activities within the centre. The private/business user will have the greatest access to uses and activities within the synergy centre.

The synergy centre will consist of public areas, semi-public areas, and totally private areas within the building. The help desk/main reception areas are available to all users and visitors as the initial point of control. Beyond these areas the hallways, staircases, and walls will separate and stratify the next level of uses. Public areas could remain or be confined largely to the inner part of the building on lower levels while semi-private and private areas could be found on the periphery or on top floors.

Design interventions will be used to achieve sensible separations and divisions of space. The intent is to provide a blend of public, semi-public, and private spaces. Some specific types of funding may require the space to be public and allow for public access, while other spaces will require user fee to access private spaces. The limitation of most other business centres is that the facilities are totally private and are exclusive for businesses. On the other extreme community access centres are totally for public use and tend to lack upgrading, help, services, and support.

A major attraction of the synergy centre will be that it provides access to a range of individuals and businesses, which will have greater potential in creating a more diverse environment for synergy amongst its users. Combination and integration of public and private spaces will reflect demand and funding, however, minimum of each needs to be maintained to ensure variety of users the potential for synergy.

In order to appropriately separate public from private spaces the synergy centre will be designed in both obtrusive and non obtrusive manners to create excitement and synergy, while maintaining access security between public and private spaces, as previously introduced. This will be achieved through stratification and layering of different uses and types of space. Another way is to provide strategic access points and transition zones requiring the use of an access card to go beyond different points within the building.

Elevation, steps, and ramps can sometimes act as natural barriers that may be enough to separate uses effectively. Visual connections between spaces will be encouraged so that isolation and total separation does not occur. Note, that some offices may have limited security access, but the hallways and reception areas may be visible to the public. Glass block, stained glass, glass partition to separate certain areas allowing for some transparency and sharing of natural light. Even though access will largely be permitted, due to some privacy and information confidentiality, some areas will be totally restricted with no public access.

4.3 Diversification

Diversification of uses will be achieved and provided through design constraints and solutions. The existing building will be renovated in order to accommodate a variety of uses within the synergy centre. The constraints and opportunities indirectly create and define useable spaces for a variety of uses. These spaces should also be designed to serve or function differently for a variety of purposes.

Diversity will be achieved through the following uses and activities that will be provided or made available through users of the synergy centre:

- High speed Internet access
- Access to variety of software programs
- User identification accounts
- Digital backup and storage
- Call forwarding fax and voice
- Printing and publishing services
- Mail and courier services
- Lease office space
- Classroom and workshop areas
- Working space, cubicles
- Administration services
- Technical support help
- Training and development programs
- Advertising
- Public bulletin boards
- Membership listing
- Pay as you go services
- Statements of activity, purchases, invoices
- Cafeteria
- Other products and services available by other users

4.4 Container

Within a community there are individuals with ideas, ambitions, and energy. The synergy centre is designed to receive, process, and enable the production of products and services that otherwise would not be considered possible at the community level. It is intended to facilitate existing creativity of individuals and groups within a professional and controlled environment with minimal initial investment. As a container, the synergy centre will house a number of different uses and equipment to be accessed by individuals.

4.5 Theatre & Re-purpose of Gymnasium

The theatre located in the attic of the historical part of the former St. Mary's School building could be renovated for live theatre and the reuse of the gymnasium located in the 1959 Addition could be reused for multi-media presentations, music events, and movies.

The gymnasium could be renovated and the existing walls could be replaced with windows and glass block, while the interior walls would be removed and opened up into the synergy centre, making this part of the building more transparent and more functional. The proposed design is based on Kunsthall II, shown in the adjacent pictures, by Rem Koolhaus. In addition, the intent behind generating this space is to open up the existing building facade and allow the public to view inside. As well the users will be able to view out into the community when inside the building. Activities within the theatre could also be broadcast in the New Media Park on the south side of the synergy centre. These live simulcasts would allow individuals to watch any performance from outdoors while adding to the diversity of experiences available through digital telecommunications.

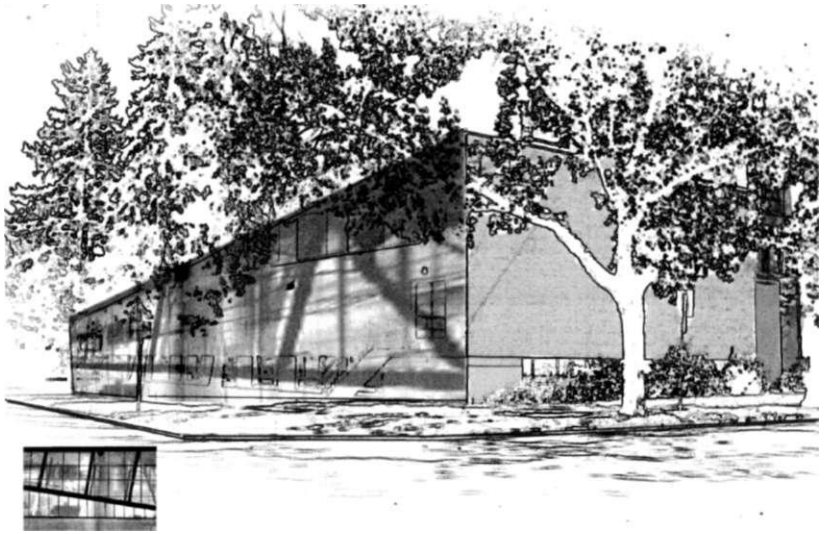

Figure 26: Proposed Mission Synergy Centre Facade

4.6 Classrooms & Work Space

The existing classrooms and few remnant offices could be renovated to accommodate both modern classrooms and appropriate workspace environments. These spaces could be designed to meet the anticipated demand of the uses proposed (public, semi-public, private). Most of the rooms in the building have direct exposure to outside light, which will be maintained where possible.

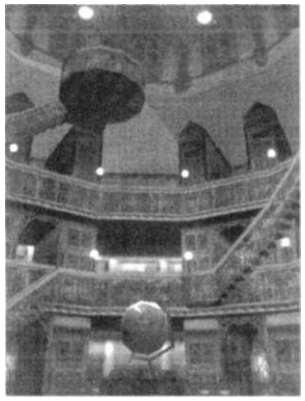

Figure 27:6DOS: The Library

4.7 Virtual Library & Archives

The development of a virtual library and archive could be achieved in partnership with the Calgary Public Library. Today, people can read and share books, magazines, and articles online. A virtual library, archived information could be available, similar to the interactive VRML project known as 6DOS:THE LIBRARY (New Media Pro, 2000) in the synergy centre.

4.8 Proposed New Media Park

The New Media Park could be connected to the synergy centre. As suggested earlier, the surface parking area could be developed below grade making the surface area available for a park-like area. This New Media Park could be more than just a park. It could also provide access to the synergy centre network through wire and wireless digital technologies. The intent of the New Media Park is to enable and provide users the opportunity to work outside in the natural elements when possible.

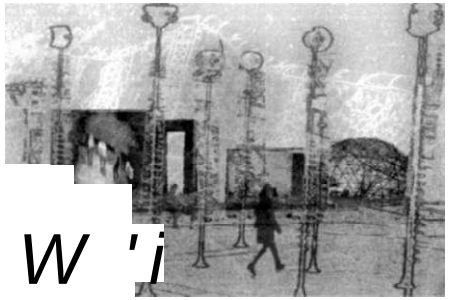

Figure 28: New Media Park

The design of the New Media Park would use cellular towers, network receivers, and portal plug-ins as part of its design. Instead of hiding and concealing these technology devices they will be used to heighten the awareness of these technologies. The challenge will be to protect these devices from vandalism and the weather elements. As well, live broadcast feed from the synergy centre theatres could be projected on the walls of small kiosks and stairwell entrances to the underground parkade, creating a dynamic environment outside.

The New Media Park and its connection to the synergy centre is indirectly supported in "Welcome to Phonespace" written by Anthony Townsend (2001), who states that, "we find ourselves building a completely new dimension into the established city-scape." Townsend also suggests that the individuals who are responsible for creating our public spaces should seriously consider the need to combine the real world with the information "space" that can be accessed through a mobile connection.

5.0 Safety & Security Issues

Safptv anH sprnritv icsiipc; arp a nrnui/inn rv-inrprn fnr hnth hnmp nffirpc anH nnhlir farilitipc The fnllnvuinn naranranhc arp intended to show how similar issues regarding security and safety can be addressed more effectively and efficiently within the synergy centre than in a home office.

The synergy centre is intended to be a 24-hour facility, however limited access to telework and office user profiles for after-hours. Public users will have reduced hours of access in order to limit traffic in and out of the facility and possible loitering in the immediate area. The attempt is to reduce or minimize nuisance conflicts.

Backing up and protecting digital information in a home office environment is typically overlooked. The reasons that information is not backed-up regularly is associated with the time and cost. In comparison, information at the synergy centre is secure and protected through daily scheduled back-ups. The cost is shared amongst all the users at the synergy centre making it more affordable and reliable.

Another point of concern regarding home office environments is that most people have disabled their passwords allowing anyone to gain access to critical information. At the synergy centre, access to your information is password protected. Remote password protected access would have limited capability, such as uploading and downloading files to only your designated directories.

Security of the physical premises of both the home office and synergy centre is very important. In comparison, the synergy centre is intended to be open 24-hours a day, where permitted. Surveillance cameras will be used to monitor both interior and exterior areas. Interior monitoring is necessary to ensure that users, equipment, and information is protected. Similarly exterior cameras will be used to monitor the periphery around the synergy centre throughout the day. The advantage of the synergy centre over a home office environment is the level of security and safety.

Automatic update of passwords will prompt users to change their passwords on a regular basis at time of login (either remotely or at the synergy centre). Failure to log-on correctly at the synergy centre will warrant a visit from security to check personal ID and direct the user to the information desk for clearance. Similarly, if this should happen from an external location, two failures would freeze the account until such time the synergy centre is contacted by the user with proper verification and confirmation of identity.

6.0 Public Consultation Process

The proposed synergy centre concept highlighted is this project is based on academic and public information that is currently available. In order to finalize the concept of a synergy centre it is recommended that a public consultation process occur prior to the formal planning process.

Caves (2000) suggest that there should be many participants involved in any digital telecommunications initiative. Some of these participants that he identifies include:

- Private citizens;
- Government;
- Business;
- Non-profit organizations;
- Educational institutions;
- Media;
- Labor; and
- Other groups.

There are also three major components of developing a community telecommunications initiative according to Caves (2000):

1. Community education involves informing residents/businesses/groups on how technologies can be used to help them.
2. Community organizing involves getting people together to work on common issues.
3. Community planning involves working with a community to meet their needs (Caves, 2000)

In order to confirm Mission's capability in supporting a synergy centre, marketing surveys at identify certain "target" groups should be undertaken. These "target" groups should consist of randomly selected individuals who are representative of the overall population, such as students, young professionals, families, near retirement individuals, and the elderly. This "target" group should participate in an initial survey in order to determine if a market niche exists and to help develop the synergy centre concept for the area through a series of discussions and presentations. Essentially, these findings should help identify the types of uses that would be of interest and supported by each group.

The information collected through the "target" groups should be reviewed and evaluated in order to develop a more specific and tailored concept design. This concept design should then be taken back to the "target groups" for confirmation. When the results and review of the concept design is satisfactory it will be presented to the entire community for their review.

The general community review should be limited to written comments so that the project team can use for evaluations of how successful the concept design is and whether or not such as facility is generally accepted by the community.

It is anticipated that the "target" group findings should have identified most of the perceived community issues and concerns with the proposed synergy centre concept. Armed with this information the task of gaining overall community support should be achievable. Some level of opposition should always be anticipated for any type of project.

The intent of the public consultation process is to provide an opportunity to refine and improve upon the initial synergy centre concept that is specific to the community needs that have been confirmed through the process and generally accepted research. The extent or degree of public participation is difficult to establish for any project. However, it is important that a balance be struck to involve the public throughout the entire process.

Chapter 7 - Conclusion

1.0 Introduction

Digital telecommunications and its potential impact on the urban form are gaining interest and momentum in planning. Telecommunications initiatives, such as telecommuting, small office home offices, and teleports are being researched by a variety of disciplines including planning. The major obstacle for planning research is the fact that digital telecommunications appears to challenge the planning paradigm understood and used by many planning professionals and educators. Digital telecommunications not only provides us with the ability to change the way things are done (processes), but also how, when, and where we live, work, play, and learn.

As we move from a global perspective down to a local municipal perspective the ability to evaluate and study the impacts of digital telecommunications initiatives appears to improve. The concept of "thinking globally and acting locally" seems to make more sense at the municipal planning level, since these interventions (telecommunications initiatives) typically occupy physical space within the planned community.

The telecommunications initiatives examined demonstrate the flexibility and level of specialization that digital telecommunications can deliver to nations, regions, communities, and individuals. Through cooperation among government, industry, educators, and the citizenry, these initiatives demonstrate that through the use of digital telecommunications existing places and spaces can be transformed with new purpose and possibilities. As well, the impact and change brought about through the adoption and integration of digital telecommunications is fundamental rather than incremental.

The telecommunications initiatives also indicate that projects like a synergy centre located in a residential community should have good access to public transit, telecommunications infrastructure, public amenities, and large population base. The synergy centre should also provide for a variety of users, purposes, and a sociable setting that enables residents to utilize and access digital telecommunications in order to encompass the largest possible spectrum of users within the community and surrounding area.

The Community of Mission is an inner city community that has a growing potential to support a synergy centre. The current population is approximately 3,700 persons and based on existing land use the community's population at full development

could be 8,000 - 10,000 persons. Within the total population range it is anticipated that 1-2% of the working population (20-54 age cohort) would benefit from a synergy centre. This represents approximately 118-145 persons within Mission. In order to increase the number of persons who would benefit from a synergy centre the catchment's area would expand to include adjacent communities and people commuting 10 minutes by car or public transportation. Adoption of telecommuting and teleworking initiatives will likely translate to an increase of persons who would benefit from a synergy centre, particularly if they do not have adequate space within their residence.

Other community characteristics of Mission are:

- a large percentage of the population has some level of post-secondary education, which is one attribute that has been linked with adoption of technology;
- majority of the population is considered to be youthful and is also considered to be more apt to adopt technology; and
- a significant percentage of the dwelling types are apartment style that are typically smaller in size and less conducive for telecommuting or small office home offices.

In general the Calgary planning documents appear to be flexible in interpretation to allow for the development of synergy centres and other telecommunications initiatives such as telecommuting and small office home office developments. However, the Calgary Plan and the Revised Mission Area Redevelopment Plan in particular fall short of providing adequate support and direction for community level digital telecommunications and initiatives. This is a particular concern if we assume that the adoption and integration of digital telecommunications is becoming an increasingly critical factor in maintaining quality of life for residents in Calgary. The opportunity to include digital telecommunications in these documents exists when the City of Calgary reviews them in the future. That opportunity exists now for the Mission Area Redevelopment Plan, which is currently under review.

The Calgary planning documents and policies also allow for acquiring the former St. Mary's School site as a synergy centre for the purposes of maintaining open space and amenities within Mission. To facilitate the development of a synergy centre in Mission, the Revised Mission Area Redevelopment Plan should be amended to include a new section on Digital Telecommunications Initiatives. This new section should include a brief introduction, objectives, policies, and implementation of digital telecommunications initiatives and identify potential sites and areas within the community of Mission. Digital telecommunications initiatives should include at minimum telecommuting, small offices home offices, and a synergy centre.

As demonstration project, this study provides a conceptual design for the former St. Mary's School site to be developed as a synergy centre. The proposed synergy centre is intended to enable individuals to work, live, play, and learn within the Community of Mission. The broader intent also includes bringing the community residents together to build upon and enhance the existing networks that already exist and provide a technological means for citizens and community to access the global economy.

2.0 Recommendations

This project did not consider or conduct a marketing survey. It is anticipated that a marketing survey would be able to confirm the viability of such a proposed project as well as identify some of the desired uses that would be provided in the proposed synergy centre.

The City of Calgary Municipal Development Plan and the Mission Area Redevelopment Plan should be amended to recognize digital telecommunications as a tool for economic development at the local level, particularly within residential neighborhoods.

Partnerships should also be established in order to make this project financially viable. Initial Community Access Program funding should be obtained and partnerships with other public and private bodies should be coordinated. Partnerships particularly within the community businesses and telecommunication companies are paramount. Ongoing monitoring and research opportunities should also be available to subsidize memberships and facilities.

The City of Calgary should also consider evaluating whether or not there is a relationship between land use districts and location of home based businesses. This evaluation could be extended to examine the relationship between different housing types and incidence of home based businesses. It is anticipated that there would be a relationship between land use districts, housing types, and home based businesses. The results of this study could provide useful information in developing telecommunications initiatives that are specific to different parts of the City.

To take this study one step further, it is recommended that future studies consider evaluating how many synergy centres could be located within the City of Calgary. This could provide planners with some information about the catchment areas of synergy centres and identify areas of the municipality that should consider developing a synergy centre. The next step would be to design a network of possible synergy centres to be accessible to the greatest population. In addition it would be useful

to determine if there should be a hierarchy of synergy centres that feed into the Downtown Core or suburban employment centre.

3.0 Conclusion

We are embarking on "the information age" where traditional values, laws, beliefs, and traditional processes are all under siege. The infrastructure is digital telecommunications, which has the potential to have the greatest impact on where people, live, work, recreate, and learn.

The City of Calgary is currently working with residents to update the Mission Area Redevelopment Plan. Through the public consultation process discussions of digital telecommunications initiatives was suggested to the planning representatives at the City of Calgary. This study provides planners with a general overview of digital telecommunications and its applications through telecommunications initiatives. As a demonstration, the former St. Mary's School site was identified and selected as a possible location of a synergy centre within the Community of Mission. The proposed synergy centre is intended to be a quasi-public space that would fulfill the role of enabling the residents to live, work, play, and learn within their community.

The intent of developing and integrating a synergy centre within the Community of Mission was also to demonstrate that digital telecommunications can transform and reinforce spaces and places at the residential and community scale. The synergy centre concept was envisioned to address both the dynamic nature of residential communities and the urban planning policies that are influencing the urban fabric in Calgary.

The proposed synergy centre will:

- Enable and facilitate the development of telecommuting and home based businesses;
- Reduce some of the social and economic barriers to experiencing and accessing the Internet;
- Present a possible solution to inner city a school closure; and
- Provide a synergistic and professional environment for growth within an inner city residential community.

There are opportunities and mutual benefits of integrating digital telecommunications in residential communities for community purposes. Planners are very well posed to undertake this integration task by facilitating partnerships with telecommunication providers, municipal authorities, and other community interests. As well, Calgary planners should consider the adoption and integration of digital telecommunications initiatives as part of an overall redevelopment strategy for the Community of Mission.

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Appendix B - Telecommunications Initiatives

1.0 Neighborhood Office Network in Ile-de-France

In July, 1993, the concepts of the Neighborhood Office and the Neighborhood Offices Network were created by Christine Gauthier and Philippe Dorin, the General Secretary and Director of CATRAL (Regional Agency for Time Management of the Ile-de-France Regional Council), respectively. The development and implementation of the Neighborhood Offices Network was possible through partnerships with software companies, Regional Transit Authority of Paris (RATP), and the National Railroad Company of France (SNCF) (Giussani, 1995).

The Neighborhood Office is a professional working environment that is open to the public and provides various solutions to implement tele-working. The typical services and solutions for tele-working include dedicated office space, computer workstations connected to high-speed Internet access, and boardrooms specially equipped for teaching and training purposes. Space can be reserved for special events such as public meetings, exhibits, or sales presentations. Independent tele-workers have access to logistic support when working from home as well as when they are in a Neighborhood Office.

The first Neighborhood Office was opened in Provins, a small suburban city about an hour and a half away from downtown Paris — where 1,500 people commute daily. A Neighborhood Office at this location was to reduce the number of commuters, and to create new jobs and opportunities locally. The unconfirmed number of Neighborhood Offices is approximately 100 sites within the Ile-de-France Region. These Neighborhood Offices are typically located near access points to the public transportation system and are linked together by public or private digital telecommunications networks.

Access to any Neighborhood Office and equipment requires a "smart" card having a unique chip that identifies the user and personalization of his workstation settings. The card is also used for purchases and services used within any Neighborhood Office. The average cost to construct a Neighborhood Office is about $525,000 US, however this is partially funded by the CATRAL. Daily rental fees are around $70 to $105 (United States dollars) depending upon the level of service required. The proposed synergy centre in this study is modeled after The Neighborhood Office Network. The aspects of partnerships, location in residential neighborhoods, access to public transit, providing a variety of services specifically tailored for telecommuting and tele-working should be considered when developing a proposed synergy centre.

2.0 **The Calgary Technology Centre**

The Calgary Technology Centre is a 120,000 square foot facility located in the University of Calgary Research Park. The actual facility is located on a 5.85-acre site adjacent to the University of Calgary main campus and is just ten minutes from downtown Calgary and within walking distance of Brentwood Light Rail Transit Station, restaurants, shopping, parks and recreational facilities.

The facility currently houses over 75 high-tech companies ranging from one-person startups to established, publicly traded corporations. The facility offers its tenants with access to offices, laboratories, and prototype development facilities that enable and foster high-tech innovation and research.

Tenants of the Calgary Technology Centre access shared administration services and meeting facilities, which minimize overhead costs. The Business Centre Facility located within the Centre is supported by a fee basis. There are four meeting rooms that can be configured for small meetings, board meetings (28-person capacity) or theatre-style presentations (50 people). In addition, the facility uses the latest audiovisual equipment, video and teleconferencing, digital white boards, and high-speed data lines available.

The facility is accessible 24-hours a day with remote card access systems located at all accessible exterior doors as well as a second level card access to tenant zones and tenant-related business centre facility. There is also on-site parking for 300 vehicles and designated parking areas for bicycles and motorcycles.

The use space in the Calgary Technology Centre demonstrates another important aspect of synergy. Firstly, within a single facility a variety of users and services are accommodated and provided respectively. Secondly, the use of second level card accesses to zones and 24-hour controlled access offer a level of security and separation of uses. Thirdly, access to digital telecommunications services are also available within the building and meeting rooms. The variety of uses and functions available within the Calgary Technology Centre should be included in the proposed synergy centre.

3.0 High Technology Centers

The conversion of former department store buildings in the United States is a national trend. These older buildings are being converted into high-tech centers according to John Holusha in "Web Gives White Elephants a New Life." This is just one example of how old industrial and retail properties, formerly considered white elephants, have suddenly become highly attractive to Internet and telecommunications companies who need sites to expand — and need them now (Holusha, 2000).

These old buildings have what the Internet companies need which include sturdy floors and high ceilings to accommodate heavy, delicate equipment; abundant electrical power to keep the machines humming and easy access to the optical-fiber cables that are the highways of the Internet (Holusha, 2000). In most cases old industrial buildings are within good proximity to the high-volume fiber cables that have been installed along established railroad lines.

The conversions of older buildings and location to digital telecommunications are two important factors when selecting the building and site for a synergy centre. A synergy centre could be located in a new building, but for this study it is proposed in an old abandoned school. The former St. Mary's School site is an older building with high ceilings and can be easily serviced with digital telecommunications infrastructure.

Location to digital telecommunications is an important factor to consider when proposing a telecommunications initiative, such as a synergy centre, which is dependent upon this type of infrastructure. Both Shaw Communications Inc. and Telus Communications Inc. have advanced telecommunications infrastructure in the area, which can service the proposed synergy centre.

4.0 **Community Access Program**

The Community Access Program (CAP) is a federal initiative that is focused on providing Canadians with affordable public access and to assist Canadians in developing skills to utilize the Internet. CAP sites are typically located within local schools, libraries, and community centres which act as the "on-ramps" to the Internet and provide support on how to make the best use of the Internet. CAP is also a joint venture of federal, provincial and territorial governments and may include interests of the private sector and local communities to ensure that the economic and social benefit of the Internet is accessible to all Canadians (Industry Canada, 1999).

Since its launch in 1995, CAP originally focused on establishing 5,000 access sites in rural and remote communities. Since then the federal budget has provided increased funding toward the creation of an additional 5,000 Internet access sites to include urban neighborhoods across Canada. Industry Canada (1999) believes that access to the Internet will help create awareness and potential to facilitate new and exciting opportunities for jobs and growth, by providing communities with the ability to communicate with one another, conduct business, enhance job skills or simply exchange ideas and information.

Each CAP site has a physical location within a community where public access to the Internet is offered. Depending on the purpose of the CAP site or the size of the community a location could have only one computer, printer, and other peripheral devices. All CAP site locations are designed to be accessible to all members of the community, including those persons with disabilities. This is achieved through "smart-card" technology is used to adapt the computers to meet user preferences and abilities. A "smart-card" is similar to your Interac banking-card that also contains computer chip with information regarding the user's identification and configuration preferences. This "smart-card" technology allows the same computer to be used by a variety of types of users, including those with disabilities.

The uses of technology and digital telecommunications in the development of CAP sites demonstrate a level of synergy. Firstly, the CAP program involves all levels of government and provides an opportunity for public and private partnerships. Secondly, the CAP sites are also designed to be accessible and adaptable to all members of the community. These two achievements of accommodating all members of the community and providing the opportunity for public and private partnerships are positive aspects that should be included in the development of a synergy centre.

5.0 The Waag (The Society for Old and New Media)

The Society for Old and New Media is a cultural research and development centre for communications technology in Amsterdam, Netherlands. The development of technological applications for the cultural and social expression of groups and individuals is believed to be central to "The Society." It is place where designers, software engineers, artists and scientists collaborate with outside partnerships in the social, education, trade and industry sectors of the economy.

The Waag building, which houses the Society, has a media lab, a monumental conference theatre, and a restaurant-cafe. The types of activities that are supported in The Waag building include Internet access, computer software & design, training, workshops, conferences, and exhibits.

The Society for Old and New Media is a foundation and its core consists of twenty full-time staff that include editorial experts, designers and software engineers. Freelancers are contracted to work on specific programs, which are dependent upon available funding through partnerships and grants. Partnerships and funding are typically provided through educational organizations, cultural organizations, public health organizations, other foundations, and governmental organizations.

The most interesting aspect of The Waag is provided through the descriptions provided by Matt Steinglass in his article "Amsterdam's Brave New World." Steinglass (2000) describes inside The Waag as "an open and sociable environment" that is more appealing that the typical "nerdy and unpleasant cyber-cafes" that he has experienced in North America. In addition, Steinglass (2000) suggests that, "in North America, new media tends to be a private affair. Whether you're emailing, web surfing or playing computer games, in the office or at home, you're usually doing it alone. In Amsterdam, using new media is more social."

In addition to the research and innovative endeavors, the sociability of The Waag is the most appealing aspect that should be encouraged in a synergy centre through design and social activities.

Appendix C - The Calgary Plan

1.0 Healthy Environments

The development and integration of synergy centres within residential neighborhoods appears to address some of the underlying objectives related to the environment. Firstly, the integration of a synergy centre within a community enables people to work, live, play and learn within their own community. This opportunity will lead to the reduction in the length of trips to get to work and in some instances reduce the dependency on private automobile ownership. Reducing the length of the commute to work, limiting the commute within your own neighborhood, or eliminating the car dependent commute altogether may result in improved quality of life and indirectly the environment. Reduced emissions and increased cardiovascular exercise by offering the opportunity for alternative transportation such as walking or cycling could also contribute to the safety and quality of the environment within a community.

The synergy centre concept also reinforces the principles of sustaining sense of community and environmental sensitivity. Firstly the integration, reuse, redevelopment of an existing building through digital telecommunications is intended to improve upon the existing environment and services currently available within the community. The scale and services provided at the synergy centre are in response to the services and opportunities demanded within the community as well as surrounding communities.

The synergy centre is intended to be a facility that promotes local and corporate responsibility in ensuring a sustainable environment through its management of waste, recycling initiatives, and programs that encourage public awareness and participation. Public awareness and participation could include seminars for community members of how they can improve the environment of their own community while improving their lifestyles.

The development of synergy centres can bring be a positive impact on the environment. This impact can be measured by the amount of converted parking areas into green space and maintaining (reducing) the demand for bigger and wider road networks to serve a larger commuting population.

The Plan suggests that Calgary should develop more compact and integrated land uses, which reduce the need to travel by car. The Plan also supports more telecommuting and flex time, which will change the way Calgarians work. More compact

and integrated land uses could be enhanced through the development of synergy centres through possible partnerships and building upon existing synergies in communities.

2.0 Growth Strategy

Policies outlined in this section of the Plan focus on the relationships between land use and mobility, the efficient use and development of land and optimization of the transportation system. Land Use and Mobility directions are intended to guide an increase mobility options, protect environmentally significant areas, reduce the reliance on the automobile/increase transit use, and reduce the need for additional river crossings. It is believed that this will be achieved by locating new jobs closer to where people live, concentrate employment in the Downtown and in several "centres," increase population densities and range of housing choices, and design transit supportive neighborhoods.

The Plan encourages suburban jobs to be located in active mixed-use and higher density centres that will work well for pedestrian and transit. The locations of these centres are to be planned to take into account the capacity of major roads and the potential for transit use. As well, new suburbs are encouraged to provide employment opportunities within walking distance from residences.

Within this land use and mobility context the integration of synergy centres would enable the City to realize each of its growth strategy objectives. The notion of locating these facilities within a residential context is supported by bringing people and work closer together, while maintaining some level of separation. The synergy centre could also be developed nearby or within transportation nodes in partnership with public transit services that could compliment the demand for synergy centres.

The integration of synergy centres at the community level could be used to implement some of the key aspects associated with linking land use and mobility, regardless of whether its in established inner city communities or new communities. The benefits of locating a synergy centre within any community is that it will enable residents to either commute shorter distances or even use alternative forms of transportation to get to work, such as walking and biking. The environmental benefits of shorter commute distances or alternative forms of transportation can be measured and the public-private partnerships could be rewarded with further incentives and/or funding the maintenance of the synergy centres at the community level.

The Plan also encourages the availability of more goods and services within walking distance of many households. In new communities, the Plan suggests that commercial development should be integrated with a mix of services and amenities to

promote an active centre for community life. Commercial development should be located and designed in a manner that supports transit use by maintaining short walking distances and safe pedestrian environments.

3.0 Healthy Communities

It is understood that there is only so much the City can influence the health of individuals and communities. In response, the Plan recognizes and provides for solutions to the reductions in senior government funding for health care, housing, education, and social programs. The City has the opportunity to extend its influence in addressing individual and community health issues by partnering with senior governments, other public agencies, non-profit agencies, and the private sector.

The policies highlighted in the Plan encourage individual and community health by making leisure and recreation activities available, by seeking to provide accessible social services and opportunities in an equitable way, and pursuing economic diversification in order to provide a range of employment opportunities to all Calgarians. With this intent in mind, the synergy centre and its partnering concept could be conceived with the specific purpose of providing accessible social services and opportunities in an equitable way as well as providing diversification and range of employment opportunities to all Calgarians.

Diversification of the city's economic base is necessary to ensure long-term health and vitality of the economy. The Calgary Economic Development Authority (CEDA) actively pursues strategies that encourage the development of the information technology industry, tourism, manufacturing and other sectors. From an economic perspective, the integration of the synergy centre concept could contribute to the long-term health and vitality of the economy, by providing and enabling greater diversification of how people work in Calgary.

The Plan suggests that maintaining and increasing quality of life be of paramount concern for the City. It is believed that quality of life is both an individual and a community issue. The indicators of quality of life identified within the Plan include: accessibility to the basic prerequisites for well-being-housing; food; clothing; education; employment; security; health care; transportation; childcare; a sense of community; democratic participation in collective life; recreation; mutual assistance and social justice. In order to sustain or maintain a high quality of life, the Plan suggests that this can be achieved through community development. In other words, collaboration with communities and interest groups through partnerships with the private and non-profit sectors will strengthen community capacity and attain a shared vision for Calgary.

The synergy centre is the bundling of community development initiatives in order to address the aspect of quality of life for businesses, communities, and individuals. The importance of collaboration is critical and it is a possible means of achieving a sum greater than the whole. It is unfortunate that the Plan does not recognize accessibility to digital telecommunications as an important indicator influencing quality of life, as suggested in the planning literature examined in Chapter 2 - Digital Telecommunications.

The integration of the synergy centre within an inner city neighborhood is an opportunity that will enable a community to rethink, and renew itself by encouraging local employment and other amenities. Through partnerships and basic fundamentals in sharing resources and sustaining synergistic activities it is believed that this will further enhance the community and municipality to optimize public investment and infrastructure. The fact of identifying an under-utilized (Memorial Library in Connaught) or for the purposes of this study an unutilized facility (St. Mary's School in Mission) for reuse in itself one step towards the potential in optimizing public investment in infrastructure. It is not only the facility that is not being used but it is important to consider the opportunity cost that was incurred to build and support the facility, such as roads, utilities, and consumption of land.

The Plan suggests that consideration should be given to programs of capital improvements in order to enhance the attractiveness of existing communities. With this perspective, the integration of a synergy centre within any community would be one possible means of enhancing a community's attractiveness and competitiveness.

The Plan states that urban design is not just a matter of aesthetics, but the design of the urban environment which influences human behavior and can be a factor in how well public facilities and private attractions are used. As a result, the Plan indicates that particular attention needs to be given to the design of pedestrian environments to facilitate and encourage the establishment of safe and lively urban spaces. If urban design can influence human behavior, then it is conceivable that the integration of a synergy centre within a community would also influence human behavior. It is anticipated that the influence would be positive in that it would enable residents of the community to work, live, play, and learn within their community as well as provide other opportunities and amenities thereby improving the quality of life.

The Plan recognizes and respects the past by encouraging the preservation and reuse of heritage buildings. Whether they are sandstone, brick or clapboard, heritage buildings are evocative monuments of time and place. The integration of a

synergy centre is another means of maintaining the St. Mary's School being of historical significance while providing space for the arts and by way of celebrating cultural diversity and contributing to our image as Calgarians.

The Plan recognizes that schools, particularly elementary schools, are vital components of community life in the sense that they help to ensure that communities retain their attractiveness to families with children. The creation of joint use sites may contain schools and playing fields and are considered as integral components of the design of communities giving a focus for community life and activity and providing open space. While most new communities will retain a site for an elementary school, construction of the school often lags behind development of the community, as the school boards try to optimize the use of existing schools and minimize their capital expenditures.

This study proposes that both public and private sectors could go one more step further to optimize capital expenditures by the development and integration of the synergy centre concept. This could be achieved by rethinking and re-evaluating the dedication of fixed space for limited uses and identifying and planning for greater diversity of uses and activities within dedicated reserve areas located in communities. In situations where there are no children in the community, the school is abandoned and becomes a haven for criminal activities. Redevelopment is necessary and only occurs after years of neglect, however it should be a seamless process as the demand for other uses shift. As the demand for space for school purposes change other uses should be integrated or substituted in order to compliment the demands of the community and to maintain a high level of occupancy.

Appendix D - The Calgary Land Use Bylaw

1.0 Requirements for Home Occupations (from The Calgary Land Use Bylaw 2P80)

(a) Home occupations Class 1 and Class 2 are limited to one per dwelling unit and to those uses, which do not:

(i) have outside storage of material, goods or equipment on, or immediately adjacent to, the site;

(ii) display any form of on-site signage related to the home occupation;

(Hi) having more than 20% of the net floor area of the dwelling unit or 30 square metres, whichever is less, devoted to business usage;

(iv) create a nuisance by way of electronic interference, dust, noise, odor, smoke, bright light or anything of an offensive or objectionable nature which is detectable to normal sensory perception outside the building unit containing the home occupation;

(v) generate pedestrian or vehicular traffic, or on-street or off-street parking in excess of that which is characteristic of the residential district within which it is located;

(vi) have more than one commercial motor vehicle under 4000 kilograms gross vehicle weight associated with the business parked on-site or in the vicinity of the site at any time;

(vii) have any employees or business partners working on site who are not residents of the dwelling unit;

(viii) have any aspect of their operation visible from outside the building where they are carried on;

(ix) include the direct sale of any goods which are not produced on the premises; or

(x) advertise the address of the home occupation to the general public.

(b) Notwithstanding (a) above, home occupations - Class 2:

(i) may be accommodated within a private garage provided it does not prevent the continuing uses of the garage for the intended purpose of parking motor vehicles, or eliminate the provision of any by-law parking requirement; and

(ii) may have one non-resident employee or business partner working on site provided there is no direct correlation with an increase in business associated visits to the site.

2.0 Possible Land Use Districts for a Synergy Centre

Public or quasi-public building means a building which is available to the public [illegible] purpose of assembly, instruction, culture or community activity, including but not limited to, a church, a library, a museum, an art gallery and the recreational, social, or educational activities of a public group or organization. A public or quasi-public building is permitted as a discretionary use in the following Land Use District Sections in the Calgary Land Use Bylaw (2P80):

21. RR-1 Restricted Residential Single-Detached District

22. R-1 Residential Single-Detached District

22.1 RS-1 & RS-2 Residential Small Lot Districts

22.2 R-1 A Residential Narrow Lot Single-Detached District

23. R-2 Residential Low Density District

24. R-2A Residential Low Density District

26. RM-1 Residential Low Density Multi-Dwelling District

27. RM-2 Residential Low Density Multi-Dwelling District

28. RM-3 Residential Medium Density Multi-Dwelling District

29. RM-4, RM-4/125, RM-4/100, RM-4/75 Residential Medium Density Multi-Dwelling Districts

30. RM-5 Residential Medium Density Multi-Dwelling District

31. RM-6 Residential High Density Multi-Dwelling District

32. RM-7 Residential High Density Multi-Dwelling District

35. C-1 & C-1a Local Commercial Districts

36. C-2, C-2(20), C-2(16) And C-2(12) General Commercial Districts

37. C-3, C-3(38), C-3(30), C-3(27), C-3(23), C-3(20) And C-3(16) General Commercial Districts

38. C-4, C-4(38), C-4(30), C-4(27), C-4(23) And C-4(20) General Commercial Districts

39. C-5, C-5/.75, C-5/.5 Shopping Centre Commercial Districts

40. C-6 Highway Commercial District

41. CS-1 Commercial And Service District

42. CM-1 Central Business Commercial District

42.3 CM-2 Downtown Business District

45.1-2 General Light Industrial District

50. DC Direct Control District

51. PE Public Park, School and Recreation District

52. PS Public Service District

53. UNR University Research District

Appendix E - The Inner City Plan (1979)

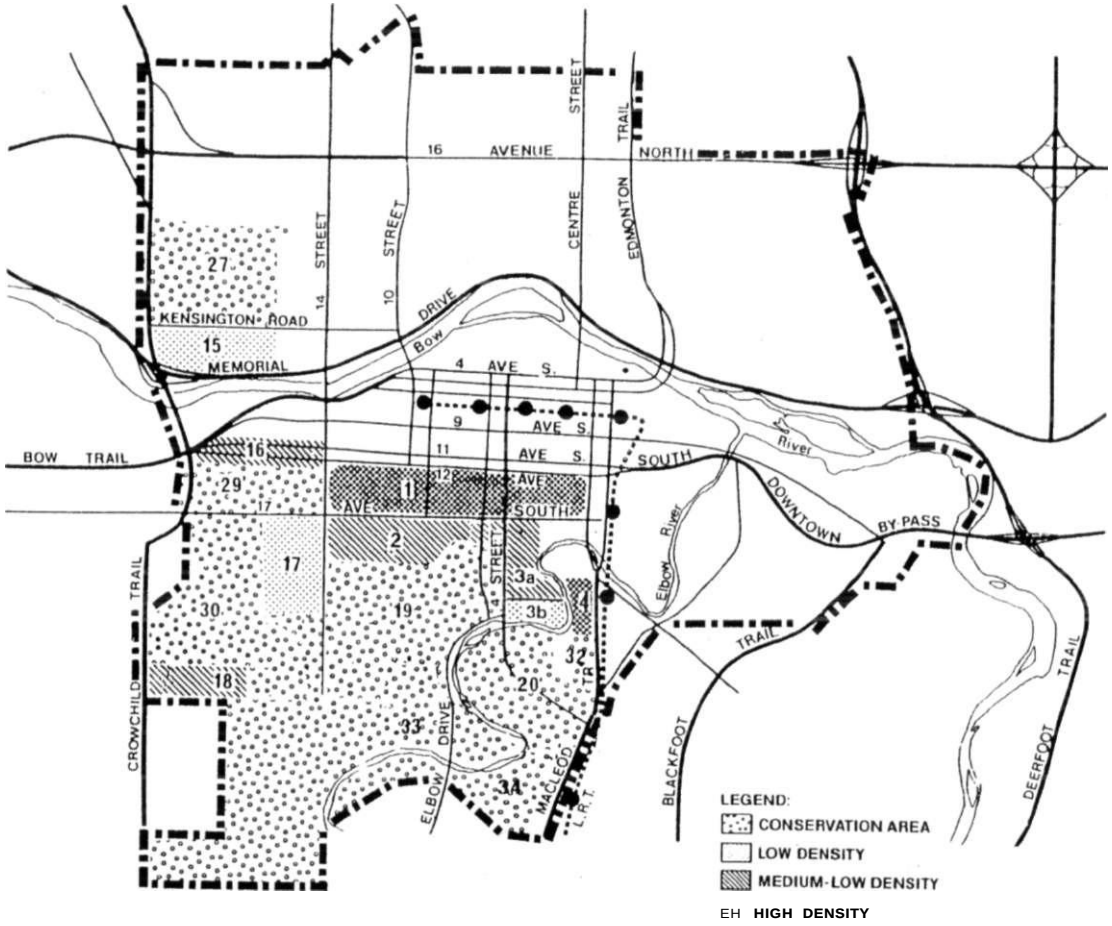
1.0 The Recommended Plan

According to The Inner City Plan (1979), a regional park is definitely an asset to adjacent communities in the same way that an escarpment is a visual amenity, but it is not reasonable that these should be considered as substitutes for local open space. The existing open space standard of 5.5 acres per 1,000 population was developed specifically for new subdivisions and is impossible to justify in the inner city.

Table E.1: Recommended Plan

AREA	CRITERIA									
	LOCATION	SURROUNDIN GUSES	QUALITY OF HOUSING	STABILITY & CHANGE	TRANSPORTATION CONSTRAINTS	COMMUNITY FACILITIES	UNIQUE FEATURES	EXISTING LAND USE CLASSIFICATION	DENSITY RECOMMENDATION	SPECIFIC GUIDELINES
3A Mission (North of 25 Avenue)	Excellent Close to downtown Specialty shopping Amenities	Residential Open space Shopping	Marginal	Active Considerable redevelopment	Served by 17 Avenue & Macleod Trail, 1 Street provides a direct link to downtown	Schools Open space Lindsay Park has the potential to serve as a major recreational facility	River Institutions Potential heritage sites		Mediu m Low	Open space should be improved Setbacks from river
3B. Mission (South of 25 Avenue)							Existing uses are intense		5)	
Source: The City of Calgary, Inner City Plan, 1979.										

Table E.1: Recommended Plan is a summary of the criteria, recommendations, and specific guidelines for the Community of Mission according to The Inner City Plan (1979). The corresponding *Figure E.1: Recommended Plan* is provided on the next page. The Inner City Plan (1979) provides a variety of means that might be used to obtain local open space, which include: Improving the quality and usefulness of existing open space; street closures; redevelopment levies; land purchase; use of school property; and bonus systems. It is suggested that the most appropriate means should be determined at the community planning level (The City of Calgary, 1979). The Inner City Plan (1979) also recognizes that schools and school sites are essential ingredients of community life and open spaces within the inner city. Area redevelopment Plans should contain recommendations for specific uses of school sites declared surplus for educational purposes. The plans should also include recommendations as to how the proposals may be implemented.



THE RECOMMENDED PLAN

(TO BE USED AS THE CURRENT BASIS FOR AREA REDEVELOPMENT PLANS)

Figure E.1: The Recommended Plan