Executive Summary

Community services are the defining element of any community. A complete, healthy and vibrant community has schools, community facilities, appropriate public transit, and useable public open spaces. These elements create an environment that allow residents to become part of the community by providing opportunities to walk freely within the neighbourhood, to enjoy open space, or to take a bus to the nearest café. Community services may not be the skeletal makings of a community, but they are the muscle that makes the community strong.

The purpose of this document is to outline services that will be included in Pine Creek Villages. Two scenarios will be examined: 1) designs according to current City of Calgary planning processes; and 2) designs that incorporate joint use facilities and transit oriented development.

Schools

Schools serve as a stepping-stone for communities to be healthy and grow. They offer the community a place to meet, as a place that looks over their children, as a place to play. In a nostalgic sense, schools are the community. However, the school's relationship with the community is under financial pressure and many of the strict planning guidelines that have been put into place have left vacant fields for communities to look at and not enjoy.

New communities, in an attempt to raise density, have lost valuable open space due to an outdated land calculation system that is held by both of Calgary's school boards. Calgary's school boards are acquiring more than 75% of the municipal land reserve that is intended for schools, community facilities, and open space.

The school section looks at the current model that new communities are being built under. It will show the available space for facilities other than school sites and how it will directly affect the community. This section will also look at some alternatives that school boards may use to increase the likelihood of a school being built. Joint use

agreements may be the predominant way for schools to exist within a community; creative ways to implement the agreement will reduce costs, reduce land consumption, increase community interaction, and offer more amenities to the community. This section will also look at one school that has been built, in Alberta, following a joint use agreement and how it has benefited the community.

Transit

Even though the current Calgary Transit System offers a good quality of services, the population in Calgary still relies on the idea of using private cars, either for convenience or for status. Also, late implementation of the LRT system in new suburban developments (because of the minimum population threshold) has contributed to making the Calgary population dependant on vehicles.

New approaches based on transit oriented development are taking place as part of planning policies. By generating a balance between different modes of transportation, pedestrian-friendly streets and encouraged use of the public system, cities can be made safer, healthier and more vibrant. Key to the success of transit oriented development is the community and neighbourhood node structure, road hierarchies, and land saved through an adapted Park ‘n’ Ride site.

Community Facilities

Based on the community node and the neighbourhood node concepts, many facilities will be strategically located throughout Pine Creek Villages to promote accessibility of services. Through these facilities, residents will have opportunities to meet together and interact while their various services requirements are met. Appropriate facilities contribute to create and sustain a vibrant, healthy, safe and caring community, and enhance the sense of community. Through joint use of sites, some land requirements for

community facilities can be reduced and this will save costs for infrastructure and maintenance.

The facilities considered in the plan include: fire / EMS / police services, public library, community associations, medical clinics, recycling depots, bottle depots, post offices, churches / places of worship, and daycares.

Public Open Space

There are two ways for the city to acquire land for public open spaces. The first is through the environmental reserve and accounts for 473 acres available for passive recreation in Pine Creek Villages. The second method is the municipal reserve which is ten percent of the gross developable area provided by the developer. However, the land available for public open space from the municipal reserve is dependent on the needs of schools. Under the current policies, the two school boards will require a significant portion of the municipal reserve land (based on a population of 74 000) leaving public open space with only 48 acres of land to share with the community associations. A second alternative is to create joint use sites which increase the land available to 187 acres. Nonetheless, the land required for schools is still attached to the site, but designed in such a manner as to provide activities for the entire community.

Municipal reserve public open spaces should enable all residents to recreate and interact within the neighbourhood or community. This is accomplished by designing a diverse range of public open spaces including active and passive recreation parks, a pathway system linked to the regional system, natural environmental parks, urban plaza and employment centre parks. Other uses for these sites include stormwater management, educational opportunities, community involvement and stewardship, and ecological functions such as habitat and wildlife corridors. In addition to the diversity of activities required, one of the main roles of public open space is to create connections between schools, transit, roadways, parks and other community facilities.

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3.0 Community Services

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3.1 Introduction

The future site of Pine Creek Villages has tremendous opportunities for unique community design. The area is bounded by Highway 22x to the north, Macleod Trail to the east, 14th St. to the West and Pine Creek to the south. The entire site encompasses 3600 acres (Figure 3.1 and Appendix A for Calgary context) of which much land is covered by wetlands and environmentally significant areas. The landscape of Pine Creek Villages provides considerable natural amenities, but these features also constrain development.

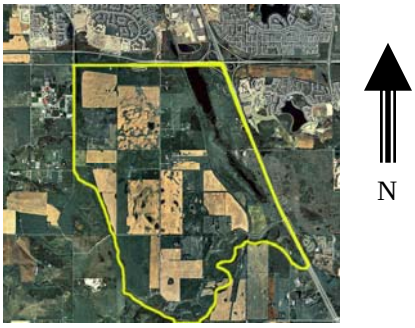


Figure 3.1: Site Context

Community services play a vital role in the design of communities and neighbourhoods. These are the services that bind community members to the area and provide vitality to living space. Streets that are walkable with efficient, convenient transit enable residents to enjoy amenities and receive necessary services without having to rely on a vehicle. Inclusion of school sites is fundamental to any new suburb. However, the design strategy for Pine Creek Villages is also to ensure schools are integrated into the community through joint use sites; thus, encouraging diverse activities for all residents. Essential services such as police, fire, EMS, libraries, health care and community associations are strategically located through the study area so every resident has access by walking or transit. Designing community services in this manner provides Pine Creek Villages with an immense opportunity to create public open spaces that draw the community together. With more public space available through

joint use sites, a diverse range of activities can be accommodated. The creation of a significant public realm with services centred on community/neighbourhood nodes promotes civic involvement and enjoyment of the local amenities.

3.2 Background

3.2.1 Mission Statement

To design community space focused on the needs of residents while fostering community involvement, accessibility and environmental protection.

3.2.2 Objectives

In designing community services for Pine Creek Villages, there were four main objectives: healthy, liveable communities, ecological protection, accessibility, and efficient land use. The detailed objectives for each of these categories are discussed below.

Healthy, liveable communities:

- To create communities that respond to the changing recreational, social and educational needs of residents.

Ecological Protection:

- To design environmentally sensitive spaces for use as wildlife corridors and passive recreation trails as well as educational opportunities to promote awareness and stewardship.
- To encourage public transit and alternate modes of transport resulting in lower air pollution emissions.

Accessibility

- To ensure that all residents have convenient access to community and regional services through walking/cycling or public transit.

Efficient Land Use

- To promote joint use sites between school boards, community facilities and open space so all residents may enjoy the community's amenities.

3.2.3 Approach

In planning for community services, two scenarios were developed to compare alternative planning techniques and the results of each. Scenario A: Current Practices uses the City of Calgary's current policies and regulations to create community services and tends to have separate land uses and funding. Scenario B: Joint Use, Transit Oriented Development (TOD) focuses on joint use sites, TOD, integration and linkages between community services, accessibility of services, ecologically sensitive corridors and space for active recreational opportunities. Based on these elements, recommendations were made for number of facilities and locations.

3.2.4 Methods

In preparation of this report, several methods were used including:

- a literature review of key documents (Calgary Plan, Sustainable Suburbs Study, Open Spaces Plan, MGA, FCC "Ideal Community", TCRP Reports, Natural Area Management Plan, various Calgary community plans);
- interviews (with staff members from Calgary Parks and Recreation, the Catholic Board of Education and the Public Board of Education);
- case studies (Fox Run School, Somerville, Massachusetts, Nose Creek Recreation and Library Complex, South East False Creek, Stapleton Colorado, Baxter Village) were

analysed to determine how some of the recommendations function in existing communities or plans;

- land requirement calculations were conducted for both scenarios allowing comparison between the two planning styles; and
- information was gathered from guest lecturers, videos, a site visit and brainstorming.

3.2.5 Overview of Trends, Policies and Guidelines

Pine Creek Villages is expected to be a suburban residential area with a population consistent with trends in Calgary. Initially, the population demographic of suburbs is young and generally first home owners. However, the community's needs are dynamic and within ten years, there are more children and elderly people. By twenty years, the maximum population is reached (Abrams 2001, 3). In the Pine Creek Villages scenario, the development time of 40 years suggests that the maximum population for the entire region would not be reached for 60 years. By that time, the population would be diverse across the entire site. Thus, community services must be designed in such a way as to anticipate the changing needs of the community members.

The Sustainable Suburbs Study highlights many of the objectives of this report and provides guidelines for the development of new suburbs. Included in this report is a sweeping statement from the Calgary Transportation Plan that supports the design elements for community services. The Calgary Transportation Plan states,

> include community and neighbourhood centres, designed to be pedestrian and transit-friendly, which provide a mix of services and amenities for nearly all residents and a range of job opportunities; accommodate a mix of compatible land uses; provide for natural areas to be protected and integrated into both regional and neighbourhood open space systems; contain a variety of housing types; achieve a density of at least 17.3 units per gross ha (7 units per gross ac); be designed to encourage people to make more of their journeys by walking, using transit or cycling; and be designed with an aim to reducing the costs associated with the construction and maintenance of public infrastructure (qtd. in City of Calgary Planning and Building Department 1995, 1).

The recommendations and policies found in the Sustainable Suburbs Study, the Calgary Plan, the Open Space Plan and GRAMP were used to inform this study.

Moreover, the trend towards joint use sites is a major element of this report and was developed based on the Joint Use Agreement (1994, 4.10) between the Calgary Board of Education, the Catholic Separate School Board and the City of Calgary.

3.2.6 Assumptions

In order to coordinate with the policy, employment and housing groups, several assumptions were made about the planning of Pine Creek Villages. These assumptions include:

- an area of 3600 acres;
- a population of 74 000 people;
- a development time of 40 years for the whole area;
- a population density of eight units per acre;
- six communities ranging between 10 000 and 12 000 people each;
- two LRT stations will eventually service the area;
- vehicular access provided via Macleod Trail, Highway 22X and the future Sarcee connection;
- the city's authority to acquire MR and ER lands is provided through the MGA in sections 661-670. This enables the city to claim ten percent of the gross developable land for MR and undevelopable lands for the ER (detailed explanation below); and
- allotment of land to ER equals 472 acres and MR equals 309 (Table 3.1 and 3.2).

Environmental Reserve Allocation	
	Acres
Pine Creek	75
Priddis Slough and Radio Tower Wetlands	397
Total	472

Table 3.1

Municipal Reserve Allocation	
	Acres
Total Area	3600
Minus ER	472
Minus Area for High Schools	40
Gross Developable Area	3088
Minus Municipal Reserve (10%)	308.8
Minus Transportation Requirements (27%)	750.4
Net Developable Land	2028.8

Table 3.2

3.3 Schools

3.3.1 Introduction

Schools should be viewed as a community resource, and every community as a resource for the schools. Creating an environment that allows the school to serve, as a neighbourhood node, will ensure that the community will use the school site to its fullest capacity. School sites should be centrally located, within the community, making the site available to local residents to use for both educational and social functions. The school section provides the methods that both the Calgary Board of Education (CBE) and the Calgary Catholic School District (CCBE) use to determine the amount of land that is needed for future school facilities in new communities. Population targets that have been established help determine the number and type of school facilities that will be needed by using population threshold guidelines created by each school board. This section will also look at current policies that the boards' use, and some current joint use trends that are emerging that will benefit the school boards, the city, and the local community. This section will focus primarily on elementary and junior high schools; both school boards are not responsible for the development of high school sites.

3.3.2 Assumptions

The following assumptions are included, in order to establish a time frame for building school facilities in new communities:

- school boards will ensure that neighbouring schools, in separate communities, are used to their fullest capacity prior to building new educational facilities;
- community and neighbourhood development will be built and sold in separate phases;
- phasing of entire area will be completed in 40 years;
- community will be built to house 74,000 people;
- the respective school boards will determine school site requirements for each level of school, except high school;
- land that is reserved for school sites is directly withdrawn from the mandatory amount of municipal reserve (MR);
- threshold populations have been established by the two school boards to determine the amount of land that will be needed according to a projected population in the community;
- schools will be built after the community has been built and the threshold population and appropriate demographics have been achieved; and
- the Province of Alberta will provide funding.

3.3.3 Case Study

The idea of joint-use schools, meaning the development of kindergarten to grade 12 schools in combination with other facilities, is the key to help make schools the centres of their neighbourhoods. Today, most educational facilities are under utilized as stand alone institutions with limited access or joint use by other community organizations.

New school facilities should be accessible day or night to the community's needs. Schools should serve, as a variety of community needs in partnership with public, civic, and private organizations. Innovative designs for new school facilities can accommodate direct community access to open spaces, libraries, theatres or gymnasiums.

Unfortunately, many school districts seem to have never included developers, the municipality, or the community in the new school design or planning process. Rigid guidelines, set by school boards, have restricted the effectiveness of new communities by acquiring more valuable open space land than may be needed. Often school boards do not have the appropriate funding to build facilities on these sites and the land is left vacant.

Creative joint use agreements can give new communities the opportunity to have a school, have more free open space, and have community friendly amenities the surrounding neighbourhoods can enjoy.

Red Deer Regional Catholic School board and the Chinook Edge School Division received approval from the Alberta government, and built a joint use facility in Sylvan Lake. The catholic school is an elementary/junior high population, while the public system included grades 6-8.

Building a joint use site, between the two school boards, just seems to make sense. The Fox Run/Mother Theresa joint use school facility has a larger gymnasium than the traditional school; it has a 225-seat performing art centre, and a commercial kitchen that can be used for catering. The school also has two separate library areas, community offices for community associations, recreation offices, and a community meeting room (http://www.group2.ab.ca/Portfolio/Education/education.html).

Integrating these two school boards in one facility may be challenging, however the benefits far outweigh the negatives. The Calgary South West development area, by using innovative joint use agreements could have schools built faster (more funding), have more space available for open space, and offer the community more services than was previously possible. The Calgary school boards are hesitant in over seeing such lofty endeavours,

however, once the inhibitions have been surpassed the South West's new communities may have a high level of community involvement that has never been truly attainable in the past.

3.3.4 School Facility Thresholds

The CCSB and the CBE have established threshold guidelines that allow the boards to determine the appropriate number of school sites that needs to be allocated in new communities. These threshold guidelines look at the total potential population, according to projected density recommendations, and withdraw school space from the municipal land reserve accordingly. This land, as the name suggests, is a reserve of land that is set aside for the specified school board to use when there is an appropriate demographic and population living within the area. Therefore, it may be accurately assumed that communities that have been built in the first phase of development will receive the school facility first.

In order to have an educational facility built the school board must examine the current demographic within the area, as well as examine projected demographics for the area.

The following table examines the school threshold guidelines that have been established by both school boards.

The threshold numbers have been established as general guidelines (Table 3.3) for each school board to calculate the appropriate land needed to be acquired in new communities and are not followed strictly. The CBE and the CCSB study each development area and request land on a site-specific basis, and follow the guidelines accordingly.

The Province of Alberta will release the capital expenditures needed to construct the school facilities once the new community has attained the appropriate population threshold. Traditionally, the school boards have used a system called the mini-school. The intent of this school program was to allow for small portable school facilities to move onto the school site, until a more stable and appropriate school facility was built. The Alberta government does not fund these mini-schools, and the school boards have found these schools too expensive to maintain.

Threshold Populations Needed Prior to Schools Built in New Communities		
	Calgary Board of Education (CBE)	**Calgary Catholic School Board (CCSB)**
Elementary (Elem)	6,000	8,000-10,000
Junior High (JHS)	12,000-15,000	**
Elem/JHS	*	12,000-13,000
Senior High School (SHS)	30,000-50,000	100,000-120,000

Table 3.3

* The CBE's policy is to construct stand alone elementary and junior high schools. The elementary schools have classes Kindergarten to Gr.4, the Junior High Gr.5-Gr.9.

**The CCSB's policy combines junior high schools with elementary schools as a joint use site. (Hughes 2004; Stewart 2004)

Schools will be built to be flexible with the community's needs. Each school will be built to have a core student population (Table 3.4), once this population has reached capacity the school will have the ability to attach a 'portable' onto the main structure. This portable system will accommodate the community's needs as the area grows in population, and as the area is waiting for other educational facilities to be built in locations that have reached the population threshold. The schools have been designed to be able to attach up to sixteen portables onto each core structure, allowing for a longer lifespan of a school facility as the community demographics change over time.

Priority will be given to elementary schools so that young children will be able to walk to school, or so that young families can walk their children to school. Junior High schools will be built once the necessary thresholds have been attained in the community, until then the children will be bussed to neighbouring communities.

Student Population Targets		
	Core Enrolment	**Maximum Enrolment***
Elementary (CBE)	250	450
Elementary (CCSB)	300	700
Elementary/JHS (CCSB)	400-425	700-750
Junior High (CBE)	500	800-900
Senior High	1500	2200

Table 3.4

*Maximum enrolment includes the school portables; core enrolment is the built school facility.

3.3.4.1 Land Requirement

The land needed and acquired from the MR varies between school types and between school boards (Table 3.5). Calculations for the Pine Creek Villages' school needs have been based on a population of 74,000 people. The threshold system creates an environment that allows school boards to acquire more land as the density of an area increases. The following table looks at the amount of land that is needed per school type and board. The CCSB policy is to not have a stand-alone Junior High school. The CCSB's policy is to have joint-use site that combines both elementary and Junior High facilities.

School Land Requirements (in Acres)		
	Complete Land Parcel	**Foot Print of Built Structure**
Elementary (CBE)	10	4
Elementary (CCSB)	9	4
Elementary/JHS (CCSB)	12	4.5
Junior High (CBE)	12	4
High School	20	6

Table 3.5

3.3.5 Guiding Policy for School Sites in New Communities

- Schools should be centrally located within the community, allowing for easiest access to residents.
- Elementary aged students must not be located more than 1.2 kilometres away from school without appropriate transit links.
- School children will be bussed to existing school facilities, outside of the community, until the appropriate thresholds have been met and a facility is built.
- The joint use agreement will be examined and encouraged on all levels of educational development to promote efficiency of land use and community interaction. Ex. (Public/Private, CBE/CCSB)
- Appropriate phasing will occur as the new community grows with the priority given to elementary schools.
- Mini Schools will be discouraged and will not be used as an alternative in phasing.
- School facilities that are built will be flexible enough to use up to 16 portables. This will allow for greater usage, and life expectancy of school facility.
- Vacant school sites will be re-examined, in the open space plan, after 20 years following first phase of development.
- School sites will be built to serve as a neighbourhood node or focal point of the community. Full community access is a primary goal.

3.3.6 Scenario A: Current Practices

The study area of Pine Creek Villages has a square area of 3,600 acres and a projected population of 74,000 people. Following the current policies, standards, and guidelines a total of 26 school sites, including two High Schools will be required. In Scenario A the assumption is that the CBE will build stand-alone elementary and Junior High schools. The

CCSB will build stand-alone elementary schools and combined elementary/Junior High Schools.

In Scenario A, an estimated 261 acres will be needed from the available 309 acres of MR (Table 3.6). This will leave 48 acres for open space within the entire developable area. Two High Schools will be built within the area; however, the land used for these sites will not come out of the MR.

Scenario A: Schools Needed and Land Usage			
	# of Schools needed	**Total Land needed per school (acres)**	**Total land needed from the MR (acres)**
Elementary (CBE)	12	10	120
Elementary (CCSB)	5	9	45
Elementary/JHS (CCSB)	3	12	36
Junior High (CBE)	5	12	60
Senior High	2	20	*this land has been removed
Total	26 schools	63	261

Table 3.6

3.3.7 Scenario B: Joint Use, TOD

Scenario A has not utilized many of the joint use opportunities that are available. Using some tools that other municipalities have adopted would help reduce the amount of MR that is used by the significant school boards. One such tool would enable the joint use between the two school boards. Creating an environment that enables schools to be built on the same school site, and perhaps within the same school facility. This will reduce the amount of land needed and acquired from the MR, allowing some of this valuable parkland to go into alternative uses such as open space or community facilities (Table 3.7). Combining the two school boards, on one site, will also increase the opportunity for schools to build at a more

reasonable pace. Schools will be built more accordingly with the growth of the community, reducing the amount of vacant land that is left in many of the new communities.

Land Requirements for Schools			
	Scenario A Land Required (Acres)	**Scenario B Land Required (Acres)**	**Land Saved (Acres)**
MR Requirements			
Elementary Schools (CBE)	120	16	
Elementary Schools (CCBE)	45	NA	
Elementary/Junior High Schools (CCBE)	36	NA	
Joint Use Elementary & Elem/Junior Schools	NA	56	129
Junior High Schools (CBE)	60	20	40
Total MR School Requirements	261	92	169

Table 3.7

Schools also have the opportunity to reduce land consumption by adopting a joint use policy with community facilities. There may be opportunities to combine school facilities with libraries and other municipal community facilities.

3.3.8 Conclusion

Under current policies the amount of land that is required by the two major school boards, from the MR, greatly reduces the opportunity for other vital community uses. The land is earmarked for school site development including school facilities, parking, playgrounds, soccer fields, and baseball diamonds. Though this land may seem available to the local community to be used, the reality suggests that this land must be rented according to the joint use agreement.

Under Scenario A there is little land left over to build parks, or other open space opportunities that may be considered vital to build a vibrant healthy community. Scenario A also hinders the construction of essential school facilities within new communities due to a lack of capital funding. The projected demographics of this community suggest that many of the people moving into the area will be young families, and the fastest availability of school

facilities is essential in order for this development to succeed. The neighbouring community schools have reached their maximum enrolment and children are being bussed into further community schools.

Scenario B offers an opportunity to the community to have a school built faster because of shared costs between school boards. This will also enable the individual joint use school to have a larger school field, as well as have better facilities than was possible in the past. Scenario B also allows some of the valuable MR land to go back into the open space freeing up more land for parks throughout the community.

Scenario B, with creative negotiation, increases the probability of a community obtaining a library, or community recreation centres that may have been too expensive in the past.

Joint use sites will allow for a more appropriate use of land that will become available to the surrounding neighbourhoods. Combining resources will also ensure that the lifespan of educational facilities will increase, and the fear of losing facilities in the future will be reduced. Creative and responsible techniques of developing schools sites will increase the vibrancy and sense of community in an area, they will allow for facilities to be built faster and more effectively, they will increase land available for other uses, and they will increase the life span of all facilities.

3.4 Transit

3.4.1 Introduction

Calgary's rapid suburban growth, which is 1.9% annually according to the Transportation Infrastructure Plan, has increased travel time for commuters into employment centres. In Calgary, the major employment centre is located in the downtown core where approximately one third of the employment force commutes daily (City of Calgary 1998).

However, Calgary's downtown is not the only area where employment is offered. There are a number of industrial districts and other employment centres that make up a large portion of jobs within the labour market. Having multi-area employment centres ensures people must

commute throughout the city on a daily basis. The steady expanse of Calgary's borders and the relative low density in its communities has meant that efficient transit service is difficult to provide. This lack of convenient and efficient service has forced many commuters to drive to work; often the only person in the vehicle is the driver. According to the City of Calgary Transportation Department, Single Occupant Vehicles (SOV) made up 76% of all daily work trips while only 13% of the commuting population used public transit (City of Calgary 1998). The issue of SOV is compounded by the availability of free or low cost parking stalls within the downtown area and at various employment centres (Lynch 1974).

Calgary's large municipal footprint, combined with a city that has a relatively high income per capita has led to a city that has become reliant on private motorized vehicles for transportation. Car ownership has increased from 1.4 cars per occupied dwelling in 1991 to 1.6 cars per occupied dwelling in 2003 (City of Calgary Transportation Department 2004).

In this study we will briefly describe the legal framework pertaining to traffic standards and the current status of Calgary's transit system.

3.4.2 Trends

LRT extensions will be built into the study area by 2015 (City of Calgary 1998). Therefore, implementing an effective express and shuttle bus service prior to the arrival of the C-Train is essential to ensure that residents moving into the community have an opportunity to use public transit. If residents have the opportunity to use an efficient public transit system prior to the LRT expansion, there may be a chance that people will continue using this system rather than relying primarily on private vehicles.

Pine Creek Villages will be developed following pedestrian-friendly TOD guidelines. This will provide a safe and attractive environment for residents as well as encouraging residents to use the transit system while discouraging private vehicles. TOD communities encourage different modes of transportation – such as Light Rail System, bicycling, carpooling, walking, or in-line skating – for people's daily trips to work or shopping (Wohl 1972).

The added benefit of having a community designed with TOD is that street activity is achieved through residents being active and results in a more vibrant, safe community that has an enhanced sense of community (Lynch 1974).

3.4.3 Policies and Guidelines

3.4.3.1 The Clean Air Act (1990) and the International Surface Transportation Act (1991)

These examples of recent legislation require cities to make improvements in air quality and street congestion through more efficient transportation modes. Their primary goal is to increase public transit rider ship (Dueker & Strethman 1998, 15).

3.4.3.2 Calgary Plan (1998)

The Calgary Plan has a primary focus on public transit and transportation opportunities. The intent is to create a healthy environment through increased air quality. This can be achieved by reducing the population's dependence on the vehicle.

The Calgary Plan also seeks to make changes by encouraging the design of new communities to incorporate employment opportunities closer to where Calgarians live. It also advocates reducing traffic speeds, encourages off-street parking, and suggests locating high-density residential development near collector and major roads (City of Calgary 1998, 52).

3.4.3.3 Calgary Transportation Plan (1998)

The Calgary Transportation Plan's main goals are:

- facilitate the efficient movement of goods and services;
- provide safe travel for all users;
- provide convenient, comfortable personal travel;
- provide for personal and vehicular safety;

- offer reasonable choice of travel modes recognizing that this is not possible at all times in all locations; and
- promote a healthy environment, exemplified by clean air, minimal noise and an aesthetically pleasing appearance (City of Calgary Transportation Department 2004).

3.4.3.4 Transit Friendly Design Guidelines (1995)

The following principles have been guiding land use and development as well as the design of public system and transit facilities:

- provide appropriate community density;
- minimize walking distance;
- provide mixed land uses;
- organize density, land use and building to benefit from transit;
- create a pedestrian-friendly environment;
- route transit into the community;
- reduce transit travel time; and
- build quality user-friendly transit facilities (City of Calgary Transportation Department 2004b, 6-7).

3.4.4 Transportation Network in Calgary

Calgary's transportation road network is based on a system of road hierarchies guaranteeing the city's connectivity (Figure 3.2). This hierarchy of roads is explained as follows:

- Free ways/Express roads – The major function is to provide heavy and free flow traffic. These roadways are under federal restrictions.

- Major streets – These are divided arterial roads with at-grade intersections and traffic signals. The primary function is to collect and distribute traffic from/to freeways to/from less demand oriented streets. The average speed is 80 km/h.

- Primary collector street – This type can either be a divided or undivided roadway with traffic signals at a major intersections. The major function is to distribute traffic from major streets to local streets and to serve the traffic created within a community. It is distinguished from a Collector Street by its higher design volume and may function as a bus route. It may also serve as a community boundary. The average speed is 60 km/h.

Figure 3.2: Transportation Network
(City of Calgary 1998)

- Collector street – This is an undivided road with traffic signals at major intersections. The main purpose is to collect and distribute traffic from major streets to secondary traffic generators. It is a low volume design and may function as a bus route. The average speed is 40 km/h.

- Residential or local street – This has an undivided road design to permit low speed travel (less than 40 km/h) and provides direct access to residential, business and other adjacent properties. The intersections are at-grade and traffic signals are provided at intersections with collector streets.

- Pathway system – Pedestrian paths are physically separated from the roads and are multifunctional facilities that may be used for walking, jogging, cycling, or in-line skating (City of Calgary Transportation Department 1991b, 14-19).

3.4.5 Calgary Transit System

(City of Calgary Transit 2004)

3.4.5.1 Bus system

Low floor buses provide service in many areas of the city. These buses, which are equipped with ramps, have no steps and can "kneel" within 10 cm of a standard curb, make boarding and exiting easier for all customers. Each low floor bus can carry two customers in wheelchairs or scooters.

3.4.5.2 Shuttle Bus System

Shuttle buses allow Calgary Transit to introduce service in new communities that do not have a large enough population to support full-size bus service.

3.4.5.3 Premium Express Bus

The premium express bus provides temporary service that is implemented in areas where the majority of the community is beyond 20 minutes travel time by feeder bus to the nearest LRT station. Premium express service will be removed when LRT is extended and the communities fall within the 20 minute feeder bus travel times.

3.4.5.4 Light Rail Transit line (LRT)

Calgary Transit operates a fleet of 115 Seimens-Duwag built LRTs that operate on 35.7 kilometres of track with 34 stations.

3.4.5.5 Other Transit Services

Park n' Ride

Calgary Transit provides park and ride access for transit customers who wish to park their vehicles at designated C-Train Stations and main line bus corridors. Park 'n' Ride facilities are offered for free except at Fish Creek Lacombe Station where a few stalls are reserved as paid-for-guaranteed parking.

Access Calgary

Access Calgary provides transportation services for Calgarians who may not always be able to use Calgary Transit's buses and C-Trains. They offer a shared-ride, door-to-door service within Calgary's city limits.

Centre Street HOV Lane

Calgary's first High Occupancy Vehicle (HOV) lane is located on Centre Street North between 20 Avenue North and 3 Avenue South. During weekday rush hours the curb lane in the peak direction is reserved for HOVs.

3.4.6 Assumptions

- Calgary has one of the lowest per capita of transit rider ship among major Canadian cities (City of Calgary 1998).
- Access to Pine Creek Villages (Figure 3.3):
- North: half interchange Highway 22X and Sheriff Kind Road and one full interchange at Highway 22X and 14th Street

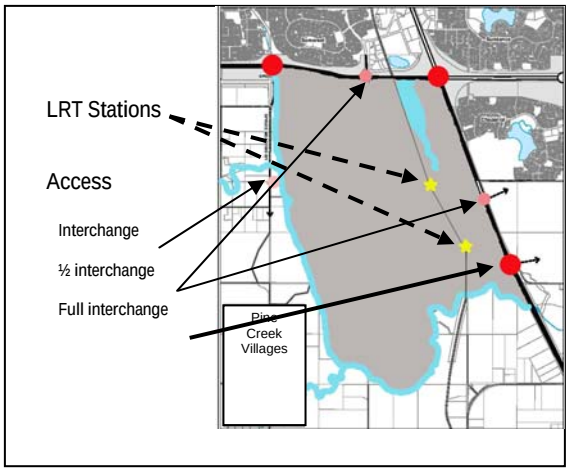


Figure 3.3: Interchange Locations

- South: restricted access because of Pine Creek
- East: half interchange at Macleod Trail and 194th Avenue and one full interchange at Macleod Trail and 212th Avenue
- West: a road linking the community with 14th Street through Radio Tower wetland
- Two LRT projected stations within the area (City of Calgary 2004a).
- Transit will be implementing on the basis of population and employment thresholds.

3.4.7 Scenario A: Current Practices

Scenario A is based on a density of eight units per acre (UPA) and on the existing parameters for new urban development within Calgary area (see Appendix B for the distribution of modes of transport under Scenario A). The information was taken from the Calgary Plan, City of Calgary Transportation Department website and Calgary's Sustainable Suburbs Study.

3.4.7.1 Service Area Coverage

(City of Calgary Transportation 2004)

Walkable distances to the nearest transit stop for all the residents based on the assumption of four blocks or five minutes walking distance. The thresholds are:

- LRT station = 600m and serves 7,533 residents[1]
- Bus Stops on residential streets = 400m and serves 3,348 residents (Figure 3.4)[2]

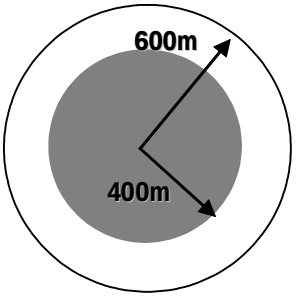


Figure 3.4: Walkable Distances

[1] Based on density of 8UPA, and considering 3 persons per occupied dwelling within an area of 358.7 acres (census community profiles)
[2] Based on a density of 8UPA, and considering 3 persons per occupied dwelling within an area of 194 acres

Distance between stations:

- LRT Station = 1.6 km intervals
- Bus Stops = 300m for primary collector streets and 250m for collector streets

3.4.7.2 Service Implementation Phases

(City of Calgary Transportation 2004)

Before transit service is implemented certain population thresholds must be achieved. Therefore, the first service to be offered would be shuttle and express bus routes. As the community grows they would be replaced by regular buses and complemented by the LRT stations. The thresholds are:

- Express bus = 12,000 residents or 5,000 jobs
- Bus = 800 residents with minimum 20-25 passengers per hour
- Shuttle bus = 600 persons[3] with a minimum of 12-15 passengers per hour
- LRT station = 25,000 residents or 10,000 jobs catchments.

3.4.7.3 Frequency of Bus Services

(City of Calgary Transportation 2004)

The following guideline is used for frequency of services:

- peak hours (6:30am to 8:30am and 4:00pm to 6:30pm) buses are scheduled every 15-20 minutes;
- midday (8:30am to 4:00pm) buses should be scheduled every 30 minutes; and
- evening (6:30am to end of service) buses should be scheduled every 30 minutes.

[3] Minimum 200 households based on 3 persons per occupied dwelling (600 people)

3.4.7.4 Land Requirement

Pine Creek Villages' only measurable land requirement for Calgary Transit is the one used by the Park 'n' Ride program:

- The average parking stalls per acre is 100-110 stalls.
- The area required for the LRT Station is 1 acre (excluding the right of way).

Based on Pine Creek Villages projected population, we will need 900 stalls[4] (City of Calgary Transit 2004a).

The final land requirement would be:

2 LRT Stations	=	2 acres
Park 'n' Ride	=	9 acres
		11 acres

3.4.8 Scenario B: Joint Use, TOD

3.4.8.1 Pedestrian and Transit Oriented Development

In this innovative scenario, we would focus on principles of TOD. This community will be compact in size, pedestrian-friendly in design, and can be customized to offer a wide variety of housing options, with convenient access to jobs and services. This makes it possible to live a higher quality life without complete dependence on a car for mobility and survival (see Appendix B for the distribution of modes of transport under Scenario B). The components of this approach are (Townes 1998, 40):

[4] Based on Calgary Transit Park n' Ride lot size by these variables:
- population at build-out
- 30% of transit trips
- 65% transit trips leave the area
- Parking lot efficiency = 95%
- 1.2 times turnover per stall
- Space for one way travel

E.g. Population of 14,000 needs 220 parking stalls.

Providing a high level of mobility and connectivity by reinforcing pedestrian & transit opportunities can be accomplished by using these TOD guidelines:

- mixed land uses;
- high density near bus loops and LRT stops;
- balanced street use (buses, cars, pedestrians, bicycle);
- transit efficiency (accessibility, frequency, quality);
- decreased daily trips made with SOV; and
- environmentally friendly (creating a buffer between pedestrians and cars).

As an organizing framework, the TOD defines the importance of community and neighbourhood nodes.

Community nodes (Figure 3.5):

This important node is located within a primary collector road with easy accessibility to the Light Rail System to guarantee easy mobility for the users. High commercial intensities, job clusters and moderate to high residential density in this area would bring the needed vibrancy to the community (Engwicht 1992, 125).

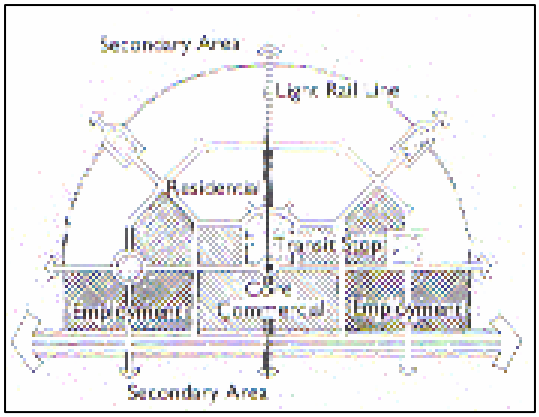


Figure 3.5: Community Node Road System
(City of Calgary Planning and Building Department 1995)

Neighbourhood nodes (Figure 3.6):

It is important to understand that a neighbourhood must have its own vibrant meeting place which will usually be a

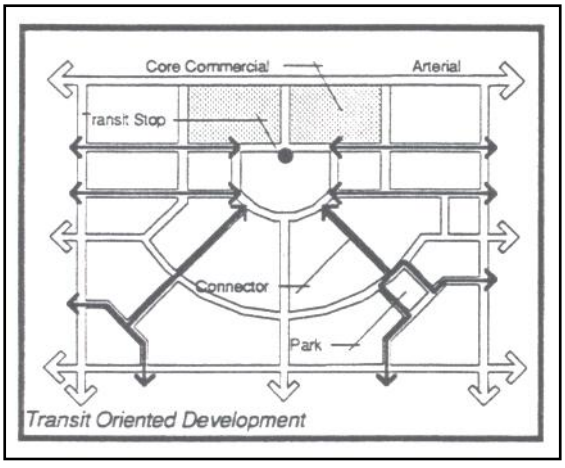


Figure 3.6: Neighbourhood Node Road System
(City of Calgary Planning and Building Department 1995)

gathering of shops, community facilities or a transit centre. Integration of living, shopping, recreation, social interaction, work and cultural activities should be located in compact neighbourhood nodes so residents can avoid travel (Engwicht 1992, 125).

Neighbourhood nodes should be located on a major intersection of collector streets with the necessary bus routes to meet the demand of the neighbourhood (Engwicht 1992, 128).

Scenario B also recognizes the importance of road hierarchy and design, but also focuses on implementing new and more ecological patterns such as green buffers between pedestrians and cars. Community amenities will be located near bus stops. Figure 3.7 shows how roads link different nodes within a community.

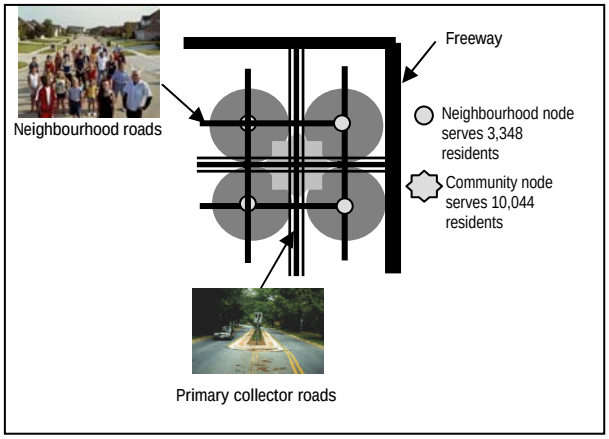


Figure 3.7: Hierarchy of Roads

3.4.8.2 Service Area Coverage

Within Pine Creek Villages, the transit network should be planned with the idea that the furthest point to a bus stop should be no more than 400m within residential areas, and 250-300m within central areas and on primary collector streets (City of Calgary Transportation Department 2004). This will provide the residents opportunities to use commuter systems to connect them with the rapid rail transit system. One of the main points would be to provide bus loops near the LRT station to make this connection.

3.4.8.3 Service Implementation Phases

In Pine Creek Villages, we must implement the idea of Express bus and Shuttle bus services before the LRT station is built. The services must be offered to encourage people to use the

transit system instead of using private cars for their daily work travel. The thresholds are the same as under Scenario A.

3.4.8.4 Frequency of Bus Services

To ensure that Pine Creek Villages has an efficient traffic system, we must ensure that the frequency of buses meets the demand of the riders because we are trying to increase the numbers of users. The guidelines are the same as under Scenario A.

3.4.8.5 Land Requirement

When the LRT station is built, the goal is to reduce the Park 'n' Ride's footprint while providing more parking stalls. A four story parkade is proposed with a footprint of 5 acres that would accommodate approximately 1600 parking stalls.

The LRT station will also acknowledge bicycle commuters by providing bicycle parking lockers.

The final land required would be:

2 LRT Stations	=	2 acres
Park 'n' Ride	=	5 acres
		7 acres

3.4.9 Case Study David Square, Somerville, Massachusetts, USA

Somerville, Massachusetts, the most densely populated suburb of New England, was selected as a case study for TOD (Townes 1998). This project incorporated a new subway station with a vision of radical street transformation and pedestrian access to the square while providing street parking, and creating opportunities for retail development. The process started by an intensive program to involve the residents throughout the planning process, creating

consensus in the idea to preserve the residential character of the community and to create a setting for transit based on a comfortable balance between pedestrian and vehicles.

Figure 3.8: Somerville, Massachusetts

The square is a convergence of a six point intersection – four major collector roads and two local roads (Figures 3.8, 3.9, 3.10). The intersection was reconfigured with a plaza added between the subway station entrances as well as other pedestrian enhancements, side roads were widened in strategic spots particularly crosswalks while the roads were narrowed by adding street parking to ensure a buffer between cars and pedestrians. This project also provided parking for the subway riders within the park 'n' ride program. Bikeways were included in the new design, bringing balance through different modes of mobility. The streets were converted into pedestrian-friendly environments that encourage safety and street side amenities.

Figure 3-21. A dedicated bus way serves the College Avenue T station entrance.

Figure 3.9: Somerville Streetscape

Figure 3-20. In Davis Square, ample paved pedestrian crosswalks and refuges are provided to make navigating between the Red Line T (subway) station, bus stops, and this seven-point intersection easier.

Figure 3.10: Somerville Pedestrian Space

3.4.10 Conclusion and Recommendations

Scenario B is highly recommended because:

- the hierarchy of roads must link the neighbourhood nodes with community nodes and with other focal points (like the employment centre);
- this system will attract users to transit;

- it will guarantee the mobility, safety and quality of services through the implementation of the express bus and shuttle bus before the LRT stations are provided;
- the employment centre within Pine Creek Villages should provide the opportunity for a significant percentage of residents to work close to home and avoiding the daily rides to downtown or other employment centres; and
- amenities within the transit system should be provided to attract more users.

3.5 Community Facilities

3.5.1 Introduction

Community facilities are essential to every community. Yet, many of these services are often overlooked by the residents. The reasoning for this is that they are expected to exist. These facilities are required in appropriate proximity to every community and many are not considered amenities. Therefore, the difference between Scenario A and Scenario B is not overwhelming in the amount of space saved. However, the difference is highlighted in the accessibility of services.

The role that police services, fire protection, emergency medical services and formal health care play in ensuring a community is safe and healthy cannot be underestimated (City of Calgary 1998, 61). Yet, community services cannot be reduced strictly to whether or not they exist. These services act as the community's backbone upon which amenities can flourish. There are certain requirements of each community facility that must be considered first and foremost, but then one must contemplate how the location of these services will impact residents' interactions. As the Sustainable Suburbs Study states, "[c]ommunities are designed to be socially diverse, adaptable to changing lifestyles and to further the objective of providing all Calgarians with access to affordable housing, education, health care, essential goods, public amenities and services, such that their basic needs are met" (City of Calgary

Planning and Building Department 1995, ii). This suggests that community facilities are a critical component of a community.

3.5.2 Case study

A good example for joint-usage is Nose Creek Recreation and Library Complex - a unique facility for unique communities.

The Nose Creek Recreation and Library Complex will be located on a 57-acre site immediately north of the Country Hills Town Centre (Figure 3.11). The site has been purchased by the City of Calgary for the new Complex and two future schools (CCSB and CBE schools). A new tri-services facility, transit hub and 700 vehicle parking lot are also being planned and constructed on the site's western edge. This project started in 1997 and the facility is estimated to be opened in the fall of 2004.

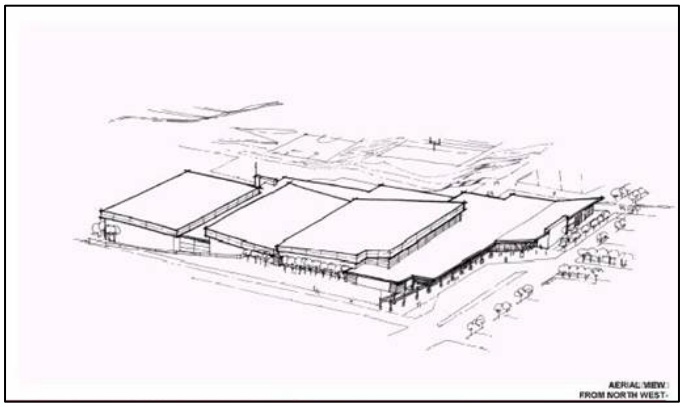


Figure 3.11: Nose Creek Recreation Centre
(Nose Creek Sports and Recreation Association 2004)

This multi-purpose facility will offer a broad range of recreation and active wellness programs, activities and services. The complex will include a lifestyle aquatics centre, a fitness centre, three gymnasiums, community meeting rooms and offices, retail spaces and a full service library. The combination of various programs, activities and services provides a great opportunity for the residents to meet together and be involved in the community activities; therefore, it helps create unique communities and strengthens sense of community. As well, this joint use site will save a considerable amount of land through sharing outdoor

facilities, open space and the parking lot. From this point of view, it is a good example for the proposed urban plaza (library/high school joint-use site) in Pine Creek Villages.

From the angle of cooperation, partnerships between school boards, government agencies and non-for-profit organizations are important to ensure the realization of the joint use project. In this case, the City of Calgary, the Nose Creek Sports and Recreation Association (NCSRA), the City of Calgary Recreation, the Calgary Public Library, the school boards, the fire and police boards are all needed to participate, negotiate and work together. The facility will be developed by this joint partnership, but operated by the NCSRA. The proposed joint use sites in Pine Creek Villages can use this site as a good example for the development of future initiatives in the Calgary context.

3.5.3 Assumptions

The assumptions for community facilities build on the general assumptions for community services. In addition to the general assumptions, the analysis used several other assumptions:

- phasing would begin from the southeast corner because of the connection to the Pine Creek Water Treatment facility, but also some development will occur in the north because of access to the rest of the city;
- existing nearby facilities will be used for the area until thresholds for each facility are met and the services are in place; and
- only the community centres will be constructed on lands from the MR allotment.

3.5.4 Neighbourhood Node and Community Node

The neighbourhood is the basic component of a community. The number of neighbourhoods in a community depends on a five minute walking distance and the population of the neighbourhood. Normally a neighbourhood is “the area served by a 5 minute walk to a neighbourhood node, and approximately one-quarter of a community’s population” (City of Calgary Planning and Building Department 1995, v). In addition, a community should have

"sufficient size to accommodate about 12,000 people" (City of Calgary Planning and Building Department 1995, v).

The neighbourhood node is located at the centre of the neighbourhood and contains a small mix of activities, uses as well as a transit stop. Furthermore, the community node is the focal point of the community; it contains a mix of public, commercial activities and a transit hub.

3.5.5 Community Facilities Considered

To achieve the basic values of planning: health, safety, welfare, efficiency, and amenity (Hodge 1997, 227), community facilities are indispensable. Through diverse and accessible community facilities, residents are given the opportunity to meet and interact as well as providing protective, social and recreational services. Therefore, community facilities strengthen sense of community.

Normally, community services focus upon the neighbourhood and community level while regional scale services are provided by regional facilities. Some community facilities tend to be located in a neighbourhood node, such as day care, but most are located near or in a community node including protective, recreational and social services (Figure 3.12).

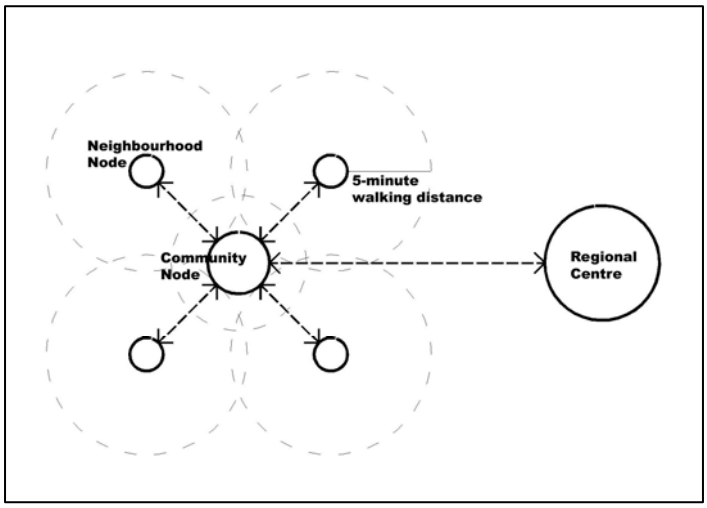


Figure 3.12: Hierarchy of Service Provision

The community services considered for Pine Creek Villages include:

- fire / EMS / police services,
- public library,

- community associations,
- medical clinics,
- recycling depots,
- bottle depots,
- post offices,
- churches / places of worship, and
- daycares.

The character, location, land requirement, linkage and integration of each kind of service will be discussed below.

3.5.6 Fire / EMS / Police Services Requirements (Appendix C)

3.5.6.1 Fire and emergency medical service[5]

The Calgary Fire Department serves the community by reducing or eliminating the threat of fire, environmental spills, accidents, and disasters. GRAMP states that, [t]he EMS Department responds to all requests for emergency medical care in the Calgary and surrounding area. Requests for service arrive through the paramedic staffed 911 accessible medical communications centre which deploys the appropriate paramedic units" (Calgary Growth Management Plan Planning Committee 1999, 26). The EMS department also receives backup by Calgary Fire Department's First Responders during time-dependent life threatening calls. The location requirement for the fire/EMS station is on a major roadway with duel direction access. Generally, a corner location and close proximity to health care facilities is preferred. As well, the facility should be integrated with police services whenever possible. The location is dependent on response time as the threshold for facilities.

[5] Normally in Calgary, an EMS station is housed within a fire station.

Thresholds:

- The National Fire Protection Association (NFPA) standard for the first pumper to arrive is six minutes while international respond time is 5 minutes.
- The standard EMS response time is within eight minutes of receiving a request for service in a life-threatening emergency.

Land Requirements:

- Three to four acres of land with a building dimension of approximately 12 000 sq. ft. for a permanent site
- One acre of land for a temporary site[6].

3.5.6.2 Police service

The primary focus of the police service is on crime prevention, crime detection, apprehension and traffic safety. The police service is dedicated to community-based policing which relies on the close cooperation between the communities and the police officers (Calgary Growth Management Plan Planning Committee 1999, 47). Each police office needs to be located on a major road with high visibility and integration with the fire/EMS service is encouraged.

Threshold:

- 80,000 people

Land requirement:

- 3 acres with a building size of approximately 20,000 sq. ft. for a stand-alone site.

[6] All community facilities' land requirements confirmed by Sasha Tsenkova (Tsenkova 2004).

3.5.6.3 Tri-service

The delivery of services from a tri-service facility has been explored by the Calgary Fire Department. This combined service helps to improve quality and reduce land requirements. The thresholds must be consistent with the individual site requirements.

Land requirement:

- 4 acres with a building size of approximately 35,000 sq. ft.

3.5.6.4 Existing Facilities

Currently, nearby protective service facilities will serve the region until the community reaches the required thresholds. This includes the city's first multi-services building (police district 8 office – Figure 3.13, fire station #26 – Figure 3.14 and EMS station #26 – Figure) located at 450 Midpark Way SE and fire station #6 located at 2375-162 Ave. SW.

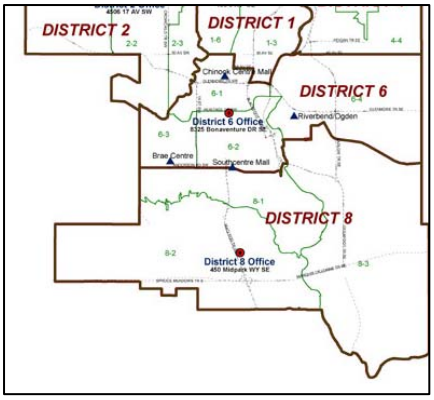


Figure 3.13: Police District 8 Office
(Calgary Police Service 2004)

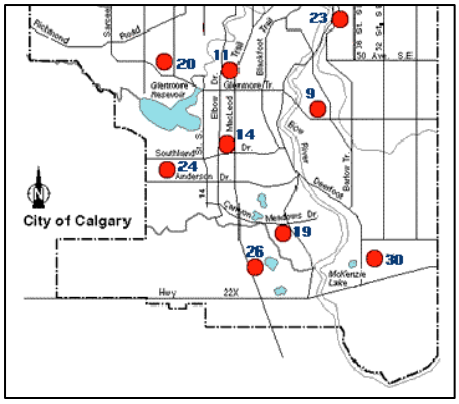
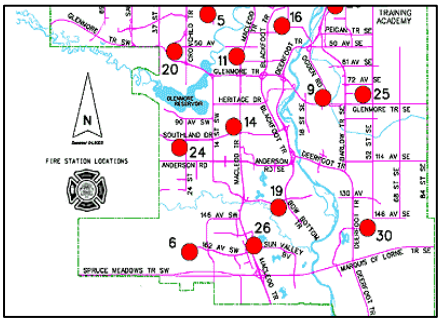


Figure 3.14: Fire Station 26
(City of Calgary 2004e)



3.5.6.5 Projection

Before the new facilities being built, the fire/EMS/police services for Pine Creek Villages will be provided by the existing tri-services and the fire station #6.

Scenario A: once the response time is challenged, a fire/EMS station will be built. A separate district police office will be built once the threshold population is reached.

- Land Requirement of 7 acres for two facilities

Scenario B: once the response time is challenged, a temporary fire/EMS station will be built. However, a tri-service facility (joint use) will be constructed once the whole area has been developed.

- Land Requirement of 4 acres

3.5.7 Public Library

Public library is another basic service for residents. The library's mandate is "to ensure equitable access to library facilities and services" (City of Calgary 2002a, 78). The planning of new services is based on population and the distance each facility serves. The target is "for all Calgarians to live within an average travel distance of 3.5 km from a library, with a minimum population base of 40,000 people in a projected service area" (City of Calgary 2002a, 78). A public library site should be located near the centre of the planning area and within close proximity to areas of high population density. Convenient access for transit and vehicles is necessary while pedestrian or cycling pathways should connect to the site. The connection to the pathway system will help to create more pedestrian friendly environment. Wherever possible, the joint usage with other compatible facilities, like high schools, should be sought for promoting efficient land use. The library building should be highly visible and can act as a landmark for the area.

Threshold:

- 40 000 people
- 3.5 km distance

Land requirement:

- 2 acres with approximately 25 000 sq. ft. of building area including 30-60 parking stalls (about 0.11-0.22 acres of land assuming 15 sq. m. per parking stall) required for a stand-alone site.

3.5.7.1 Existing Facility

The nearest public library to Pine Creek Villages is the Shawnessy Library which is located in the South Fish Creek Recreation Education and Library Complex, 333 Shawville BV SW (Figure 3.16).

3.5.7.2 Projection

Before a new facility is built, Shawnessy Library will service the area. Once the population reaches the threshold, a new public library will be built to accommodate all of residents of Pine Creek Villages.

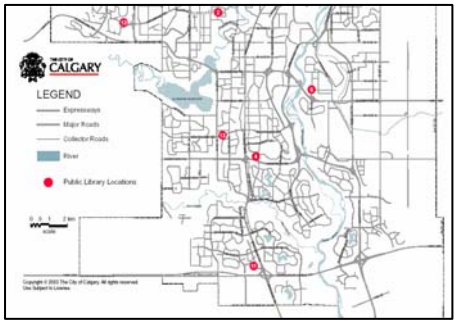


Figure 3.16: Shawnessy Library
(City of Calgary 2004f, 1)

Scenario A: Stand-alone site

- Land Requirement of 2 acres

Scenario B: Joint use with a high school

- Land Requirement of 0.5 acres

3.5.8 Community Association

Community associations play an important role for the development of communities. They are voluntary organizations supported mainly by volunteers and paid membership that offer residents a broad range of programs and services (City of Calgary Community & Neighbourhood Services 2004). For a vibrant, safe and healthy community, having playgrounds, skating rinks, parks, tennis courts, etc. is necessary. Both children and adults need places to play, recreate and exercise. Community associations are the organizations that raise funding, build and maintain these facilities, and provide various services (Federation of Calgary Communities 1999, 19 & 22)

Community associations are housed at community centres. Normally, a community centre contains a large hall (average capacity of 270 seats), several meeting rooms and a kitchen. It may also have gymnasiums, indoor arenas and fitness centres. Outdoor facilities such as tennis courts, swimming pools and hockey rinks are also common facilities for a community centre (Federation of Calgary Communities 1999, 23). Through these facilities, the services provided include recreational and social services, such as fitness and sports activities, after school child care, day care, family services, drug awareness educational programs and crime prevention programs, etc.

The site for a community centre should be located in the community node, near the spatial centre of the community, within the high density area of population and within a five minute walking distance for as many residents as possible. It should be along a major transit route and near a transit hub if possible. Pedestrian and cycling pathways should be connected to the site and integration with other compatible uses, like schools, is encouraged. Regarding design, the building should serve as a community landmark adding to the sense of community.

Threshold:

- Each community of approximately 10 000 to 12 000 people receives a community association.

Land requirement:

- 4 acres with a building of approximately 9,000 sq. ft. is required for a stand-alone site (at least 2 acres of land for every 5 000 people)

3.5.8.1 Projection

A centre for each community will be built when enough population (at least 5,000) is reached to support the facility. For scenario A, 6 stand-alone community centres require 24 acres of land. For scenario B, a joint-use site with either a junior high or an elementary/junior high school will share use for outdoor facilities, up to 18 acres of land can be saved.

Scenario A: Stand-alone site

- Land Requirement of 24 acres

Scenario B: Joint use with a junior high school or elementary/junior high school

- Land Requirement of 6.0 acres

3.5.9 Health Care Services

Health care facilities are necessary for protecting the public health. In planning for the South Calgary Health Centre, Calgary Health Region is developing a partnership service delivery model with family physicians. The service will be provided based on the appropriate location and by the most appropriate provider. Apart from the regional facility, the majority of health services are managed over the phone or in a family physician's office (Buzath 2004).

3.5.9.1 Existing Facility

The South Community Health Centre located at 240 Midpark Way SE provides the health care services for the south part of the city (Figure 3.17). The programs, services and clinics

offered at the centre include: Well Child (Vaccinations), School Health, New Baby Visits, Breast Feeding Support, Adult Wellness, Seniors Wellness, Family Planning Clinic, etc.

For the planning area, the regional scale health care services will be provided by the existing South Community Health Centre. In addition, the new South Diagnostic and Treatment Centre located in Sundance (Figure 3.18), constructed in June 2003, and a new hospital proposed to be near the intersection of Deerfoot Trail and Highway 22X will provide the regional health care services for Pine Creek Villages (Calgary Health Region 2004a).

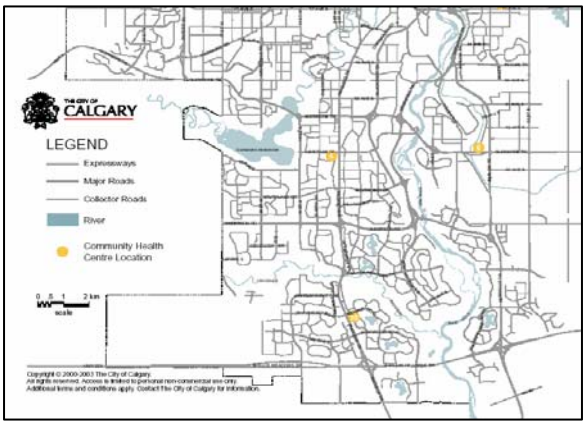


Figure 3.17: South Community Health Centre
(City of Calgary 2004b, 1)

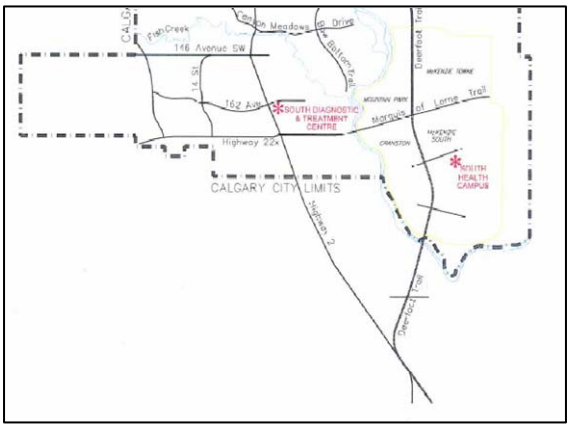


Figure 3.18: South Diagnostic and Treatment Centre
(Calgary Health Region 2004b)

3.5.9.2 Medical Clinics

At the community level, in order to create convenient, close-to-home diagnosis and treatment, three medical clinics will be needed for the six communities (one for every two or three communities). These medical clinics need to be located near the community nodes while connected to major roadways, transit and pathways for accessibility. These services should be highly visible within the community.

Threshold:

- One clinic for every two or three communities

Land requirement:

- 1 acre for each facility.

3.5.9.3 Projection

There is no difference between the land requirements for Scenario A and Scenario B. In total, three acres of land will be required for Pine Creek Villages.

3.5.10 Recreational Services

The Calgary recreation's mandate is "to enhance Calgarian's quality of life by offering accessible recreational opportunities that promote personal growth and well-being" (City of Calgary Recreation 2004). There are several regional recreation centres in Calgary. South Fish Creek Regional Recreation Centre provides service for the south and is located in Shawnessy Town Centre. This facility includes: a Catholic High School, a public library, twin ice arenas, an indoor jogging track, a community gymnasium, public education space and a YMCA.

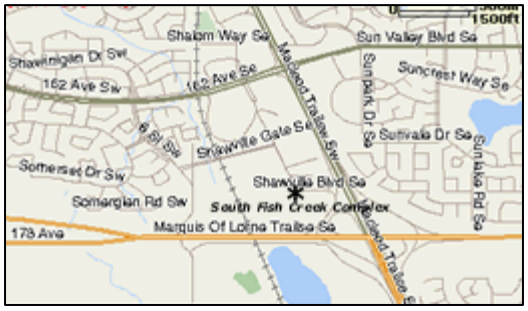


Figure 3.19: South Fish Creek Regional Recreation Centre
(South Fish Creek Recreation Association 2004)

For the planning area, the regional scale recreational service will be provided by the existing south fish creek recreation centre. Community-based recreational services will be provided mainly through the community associations. The local recreation facilities are located in community centres; therefore no further land will be required.

3.5.11 Social Services

Social services are aimed to contribute to personal well-being and enhance the quality of life for the residents. Five regions of neighbourhood services in Calgary have been established to better respond to specific needs within those geographic areas. The South Area Office is located at 502 Heritage SW (Figure 3.20). Through social workers, the social services focus is on providing public information, education, referral and advocacy.

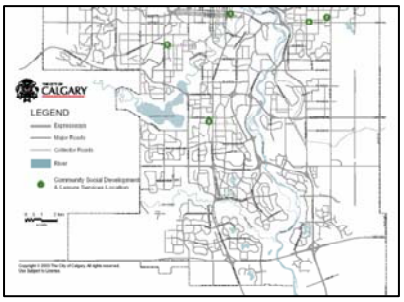


Figure 3.20: South Area Office
(City of Calgary 2004c, 1)

For the planning area, the regional scale social services will be provided by the existing south area office. The community-based social services will be provided through community associations. Volunteer social workers engage in dialogue with residents and solve problems at the community level. Offices will be located in community centres; therefore no further land will be required.

3.5.12 Other Encouraged Services

Apart from the community facilities mentioned above, there are many other encouraged facilities that contribute a vibrant, healthy, safe and caring community. They will be built depending on the communities' needs. These facilities include:

- Day care: To be located in the neighbourhood node or community centre, or along transit routes, based on development needs. Joint use with elementary schools should be considered wherever possible.
- Seniors centre: A senior's centre should be located near or in a community node, and along transit routes. The facility should also be attached to open spaces. A senior's centre is built once the maximum population has been reached and the population of seniors warrants a centre. Wherever possible, joint use such as sharing classrooms with community schools should be considered. The land requirement is three acres.

- Post office: Post offices are usually housed within retail buildings and should be located in community nodes or employment centres. The land requirement is minimal.
- Churches/worship places: Along with the community's growth, churches/worship places will be built based on needs. The location of churches/worship places should be near or in a community node.
- Recycling depot: The city's goal is to expand the recycling program by four recycling depots each year. For new communities, a recycling depot is necessary. It should be located in or near community nodes, such as grocery store parking lots, with good accessibility. The land requirement is minimal.
- Bottle depot: Bottle recycling helps to protect the environment. One bottle depot is required for the area. It should be located in or near a community node. The land requirement is one third of an acre.
- Public internet access and adaptive technology workstations: These facilities are encouraged to be placed in public libraries or community centres.

3.5.13 Comparison between Scenarios

Scenario A is based on the conventional way of separating land uses while Scenario B is based on the joint use strategy and TOD principle. Compare these two scenarios, for the principle community facilities only, Scenario B can save as many as 22.5 acres of land (Table 3.8).

Community Facilities Land Requirements (Acres)			
Typical community facilities	**Scenario A**	**Scenario B**	**Land saved**
Community Associations	24	6	18
Library	2	0.5	1.5
Police	3		
Fire/EMS	3-4	4	2-3
Medical Clinics	3	3	
Total	35-36	13.5	21.5-22.5

Table 3.8

3.6 Public Open Space

3.6.1 Introduction

Calgarians are highly supportive of their public open space and in current years have expressed their appreciation for natural environmental parks more than ever. Both the Natural Areas Management Plan and the Open Spaces Plan highlight the view of Calgarians to enhance the pathway system. One of the main comments has been that the pathway system should connect with other public open spaces and activities including natural areas[7] (City of Calgary Parks & Recreation 1994, 13; City of Calgary Parks Department 2003, 13). Furthermore, the Open Spaces Plan notes that Calgarians highly value their leisure time, but most feel that their recreational time is rushed (City of Calgary Parks Department 2003, 13). This provides sufficient reasoning to design new communities with public open spaces that link active and passive recreation throughout the area. The accessibility of recreational opportunities will allow residents to enjoy the local amenities without sacrificing time to travel. In addition to the attitudes of Calgarians, the Calgary Plan indicates that recreational and leisure services contribute to the overall health and wellbeing of a community (City of Calgary 1998, 67). It is also imperative that public open space is designed for the changing needs of the community. During the early stages of a community's life, the recreational needs will tend to be focused on the activities of young children with the requirement of being close to home, while more established communities will need to have meeting places and quiet park areas for seniors (City of Calgary Parks Department 2003, 27). Thus, the design of public open space should not be considered an afterthought, nor strictly conform to regulations. Each park, pathway and sports field needs to be considered within the community's context as well as how the linkages between these spaces create a network of creative space.

Planning for the life of a community means that public open space should encourage a diversity of uses (City of Calgary 2002b; City of Calgary Planning and Building Department 1995; City of Calgary 1998; City of Calgary Parks Department 2003). Facilities must provide recreational opportunities for people of all ages. Furthermore, as the community ages, future needs must be planned for and accommodated without sacrificing the needs of the current

[7] Defined as "relatively undisturbed areas of land and/or water, which have existing characteristics of a natural plant or animal community or portions of a natural ecological and geographic system" (City of Calgary 2002b, 78)

population. As well, one of the most important components of multiuse is the linkage to the public transit system, the schools and the community facilities through the community's open space system. Links to the regional pathway are another component that open spaces can provide to the community. However, public open space also serves the needs of ecological functions within the community and should be considered within the design such as habitat and water management.

In the case of Pine Creek Villages, the public open space system is comprised of a significant portion of ER land. The cause of the ER allocation is the wetlands[8] that are pocketed throughout this area and Pine Creek to the south. Although the reasoning behind the ER is not for environmental purposes, these areas provide a significant benefit to the community and recommendations have been made to ensure that wetlands are incorporated into the regional open space plan to maintain their sustainability (City of Calgary Parks Department 2004). The existence of these wetlands creates a tremendous opportunity for open public space that is not always available in the planning of a community.

3.6.2 Benefits

Public open space provides numerous benefits including environmental, economic, social and personal (City of Calgary Parks & Recreation 1994, 18-19). The combination of natural environment parks and green open spaces increases the biological diversity of an area, moderates extremes in temperature, reduces air pollution, and increases water quality. Wetlands also provide specific environmental benefits that are not as common with other types of natural spaces such as increased assimilative capacity, groundwater recharge, flood and drought protection as well as providing a source of nutrients for natural habitat that is critical for waterfowl (City of Calgary Parks Department 2004, 28-29). Economic advantages

[8] In Calgary, a wetland is defined as "…a water body and its bed and shores that is naturally occurring or disturbed and is located within the Foothills Fescue and Foothills Parkland Natural Regions within The City of Calgary. This wetland is saturated with water long enough to promote wetland or aquatic processes, as indicated by poorly drained soils, hydrophytic vegetation and various kinds of biological activity which are adapted to a wet environment. The bed and shores of the water body ends at the bank, or the physically ascertainable line where long action of water has caused the bed and shore to have no vegetation, distinct vegetation (i.e. marshland or other wetland vegetation) or a distinct soil" (City of Calgary Parks Department 2004, 14).

of public open space include increased property value as well as ecological services, for example, the assimilative capacity of wetlands has reduced the cost of stormwater management techniques. Socially, public open space provides opportunities for community involvement through voluntarism and interaction in common space. This space can also be used for educational purposes and can support various scientific inquiries. On a personal level, these spaces allow residents to recreate and relax within the community while enjoying aesthetic qualities. The advantages of public open space demonstrate the value that this aspect of planning brings to community life. Public open space is one of the truly community oriented functions that must be accessible to all people in order to create the lively, healthy community that is envisioned.

3.6.3 Authority

Authority for the allocation of ER and MR land, without compensation to the developer, is legislated through the *Municipal Government Act* (MGA) (RSA 2000, c. M-26). Sections 661 through 670 give municipalities the right to incorporate lands into either the ER or the MR; however, each of these has separate regulations. Land may only be designated as ER if it consists of:

(a) swamp, gully, ravine, coulee or natural drainage course,
(b) land that is subject to flooding or is, in the opinion of the subdivision authority, unstable, or
(c) a strip of land, not less than 6 metres in width, abutting the bed and shore of any lake, river, stream or other body of water for the purpose of
(i) preventing pollution, or
(ii) providing public access to and beside the bed and shore (s.664(1)).

The goal of the ER is not to protect significant environmental areas, but to identify areas that are not developable because of engineering constraints. Yet, protection does result through the city's general mandate to protect the natural environment (*Municipal Government Act*, RSA 2000, c. M-26 s. 160). Moreover, the developer is required to provide ten percent of the total developable land to the city for schools and public open space in the form of MR. Thus,

the ability to secure land from the developer for community services is derived from provincial legislation.

At the level of city authority, several plans contribute to the development of public open space. The Calgary Plan identifies the need for protecting environmentally sensitive lands as a high priority and also indicates that intermunicipal planning is encouraged to protect natural habitat (City of Calgary 1998, 25). The Open Space Plan discusses the need for recreational opportunities at a variety of scales throughout communities (City of Calgary Parks Department 2003, 13) and guides the overall open space land use planning. Furthermore, the proposed Wetlands Conservation Plan will provide policy direction for wetlands within the city that will be distinct from the current open space policies. These wetlands will be planned with the focus on ecological sustainability over recreational opportunities if the two land uses cannot complement each other (City of Calgary Parks Department 2004, 20).

3.6.4 Tools to Acquire Natural Areas beyond the Required MR

Occasionally, situations may arise in which areas of environmental significance are identified, but do not meet the ER requirements. Under the MGA, the city has the right to protect the natural environment and may do so through several tools:

- dedication of land as ER by the developer;
- dedication of land as credit MR by the developer;
- density transfer to the developer followed by a dedication of land as ER;
- required development setback standards;
- donations;
- land exchanges;
- purchase by the city (City of Calgary Parks & Recreation 1994, 32); and
- conservation easements (City of Calgary Parks Department 2004, 21).

These tools may assist the city in protecting significant natural environments while increasing accessibility to public open space if the area can remain viable with human interaction. However, it must be noted that these tools are not used very often and, generally, are dependent on the developer to agree.

3.6.5 Case Studies

In identifying appropriate ways of incorporating public open space, three main case studies were consulted. Stapleton, Colorado, Baxter Village, South Carolina and South East False Creek, Vancouver, BC all provided some insight into innovative public open space concepts.

Stapleton, Colorado is "a community comprising a network of urban villages, employment centers [sic] and greenways…" (Smart Communities Network 2004). This site has many similar characteristics to the type of development that is envisioned through Scenario B, but goes beyond the bare requirements of MR and ER lands donated to the city. Stapleton has set aside more than one-third of its land for public open space that is expected to be returned to its natural state. In addition to the open space, this community has planned for an urban agricultural area with an equestrian centre and community farm. Furthermore, the population density is 12 units per acre with each neighbourhood node providing focal points.

Baxter Village, South Carolina has 400 acres of public open space incorporating woods, parks and walking trails. Moreover, this abundance of open space is designed in such a way as to link parks, fountains and playgrounds throughout the community (Clearsprings Development Company 2004).

Finally, the proposed South East False Creek community in Vancouver, BC (Foreshore Lands 2003) promotes active recreation through sports fields as well as having ponds in parks that function as stormwater management tools. The community has a central waterfront park in the community centre with open space serving the school, community space and retail. Furthermore, this development has also included alternative uses of public open space such as educational/learning gardens, community agricultural projects (i.e. small orchards) and habitat interpretation pathways. These pathways wind through the central park and also

join the regional pathway system – the Seaside Walkway. Green roofs are encouraged in this development to assist with the collection of stormwater while providing bird habitat. There has been a concerted effort to interrelate all elements of design throughout the community by linking schools, retail and all community activities with parks, stormwater management, urban plazas, public art and green streets (Figure 3.21).

These three developments illustrate the potential for alternative designs. The value of reviewing several case studies is that there is a range of alternatives that are marketable depending on the context. As well, South East False Creek's plan suggests that it will encompass many alternative techniques, but without it having been built yet, there is no guarantee that it will be successful. Thus, the other two case studies prove that success is possible.

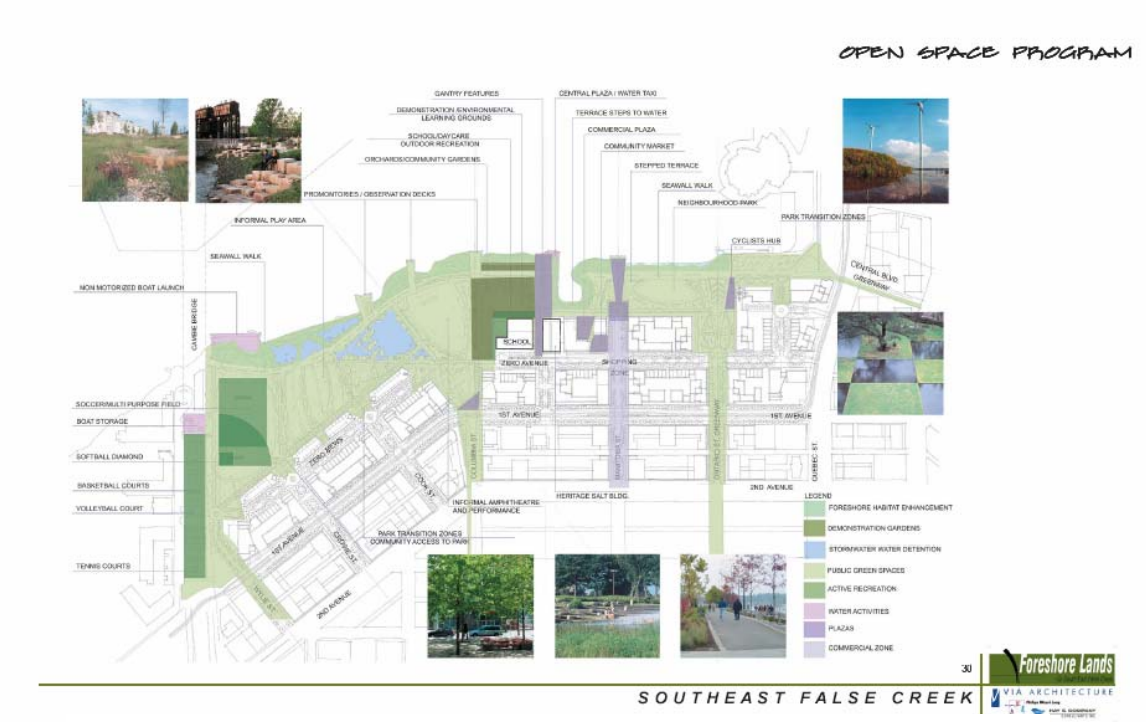


Figure 3.21: South East False Creek Open Space Plan

3.6.6 Assumptions

Creating a land use plan for public open spaces is dependent upon assumptions. As with many components of the community services section, the area of public open spaces is based on the MR (Table 3.2). The actual figure is determined by removing the land requirements for schools and parks based on a priority system that will be discussed below. Additionally, the public open spaces system includes the ER which is defined by the land area consumed by wetlands (Table 3.1). The use of the ER lands for recreation such as the regional pathway and other passive activities is permitted as long as there are no negative impacts on the natural areas (City of Calgary 1998, 25). Therefore, these two methods of acquiring land provide the basis for the public open space system keeping in mind that other land acquisition methods (described above) may be used for significant natural areas.

The second set of assumptions for the distribution of land requirements is the priority system. The Calgary Plan and the Open Spaces Plan identify three main priorities (Figure 3.22):

1. neighbourhood needs including elementary schools, elementary/junior high schools and neighbourhood parks;

2. community needs including junior high schools, community associations, open space linkages and priority environmentally significant lands; and

3. regional needs including high schools, pools, arenas, athletic parks, other recreational facilities, urban plazas and employment centre open space (City of Calgary 1998, 57; City of Calgary Parks Department 2003, 15).

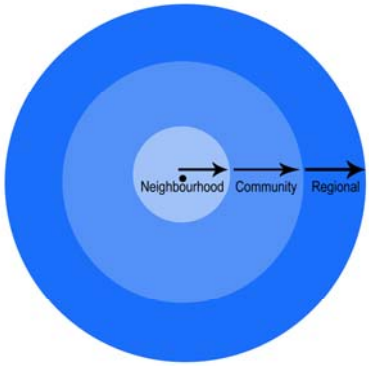


Figure 3.22: Public Open Space Priority System

3.6.7 Scenario A: Current Practices

Scenario A encompasses the current community planning practices in the City of Calgary. Considering that the MR totals 309 acres, based on the assumptions above, and the school sites require 261 acres, there is approximately 48 acres for public open space and community centres (Table 3.9). Yet, the ER increases the passive recreation opportunities dramatically because this area encompasses 472 acres of land at the periphery. Thus, it is important to focus on the priorities set out by the Calgary Plan by first planning for neighbourhoods, then communities and finally regional requirements that will satisfy active recreation needs. With a substantial land area available to passive recreation, the remaining 48 acres of land must be dedicated to the active needs of the community. At the neighbourhood level, land is provided to elementary school, elementary/junior high schools and neighbourhood parks. Thus, approximately 24 acres of land is given to neighbourhood parks which require between one to two and a half acres each. At the community level, junior high school land is already accounted for and so the remaining 24 acres of land is used for six community centres which require six acres each (Table 3.10). Under Scenario A, the MR available to the community after schools have been accounted for leaves park land severely limited. Fortunately, the ER should provide ample passive recreation opportunities. Obviously, the public open space in this scenario is limited because of the large requirements for school sites and so the alternative tools available for acquiring land may be necessary.

MR Available for Public Open Space After Schools	
	Acres
Total MR	309
School Sites	261
Available MR	**48**

Table 3.9

Distribution of Public Open Space	
	Acres
Neighbourhood Parks	24
Community Centres 6 @ 4 acres	24
Total Public Open Space	48

Table 3.10

3.6.7.1 Current Park Types

The Open Space Plan (City of Calgary Parks Department 2003) outlines five park types that must to be included in new communities. These categories are: sub-neighbourhood, neighbourhood, linear, community and district parks. The following discussion will define each of these parks:

Sub-neighbourhood Park: A small area consisting of 0.5 acres (taken from the MR) that provides for the recreational needs of young children (ages 0-5). This style of park is generally discouraged under the Sustainable Suburbs Policy, but can be used near high-density housing and in areas that are disconnected from the neighbourhood centre.

Neighbourhood Park: The neighbourhood park is centrally located to the neighbourhood and encompasses between 1-2.5 acres of land (taken from the MR). The focus for this area is on elementary aged children with space for informal sports and community facilities. Ideally, the role of the sub-neighbourhood park can be fulfilled by the neighbourhood park in most situations.

Linear Park: This is an area where the focus is on informal activities and passive recreation. The space requirements are a width of at least ten metres to a maximum of twenty metres (taken from the MR) that can be composed of overland drainage features, aesthetic amenities and connections to the formal pathway system.

Community Park: Each community should have access to a centrally located sports field for active and passive recreation. The Open Spaces Plan does not identify a specific area requirement because these sites can be used with community leases or elementary and junior high school facilities through the Joint Use Agreement. However, the site requirements for elementary and junior high schools range from five to eight acres of land without the building footprint. Thus, the size of a community park is expected to be in this range and is taken from the MR.

District Park: A cluster of three to five communities requires a centrally located district level sports field and is generally found in combination with a high school. Based on a high school's land requirements of 20 acres, the district park will likely require approximately 10

acres of land. Unlike the previous parks types, the district park area is not taken from the MR, but negotiated through the Joint Use Reserve Fund.

Additionally, the Open Spaces Plan identifies the regional recreation park and the city-wide park as important elements within the park system (City of Calgary Parks Department 2003, 31-33). The regional recreational park is a large area that encompasses both natural areas and developed parkland. This area provides year round use to local residents and the surrounding communities through programmed activities as well as attractions. Pine Creek Villages would likely develop a regional park in the northwest corner of the area to act as a buffer to Spruce Meadows, to link to the regional pathway system and to provide large scale recreation opportunities as there is a lack of regional parks in the area (Appendix D). The land for the regional recreation park would not come from the MR unless the local community's needs are met through this space. In which case, the portion of the MR land that meets the local needs would cover some of the land requirements and the remainder would be purchased. The city-wide park generally enables residents to recreate for half-day or full-day outings. These facilities are found on the outskirts of communities and would not be considered in Pine Creek Villages.

3.6.7.2 Regional Pathway System

The regional pathway system is a critical element of Pine Creek Villages' public open space plan. It is also part of the city's mandate to "provide a city-wide regional pathway system that facilitates non-motorized movement for recreation and transportation purposes (City of Calgary Parks & Recreation/Transportation Department 2000, 3). The 472 acres of ER land needs to undergo assessment to determine how much of the area can be used for pathways and passive recreation. As noted above, the ER allotment formed by the Radio Tower

Figure 3.23: Regional Pathway Connections

Wetland, the Priddis Slough and Pine Creek bound the study area. This land provides an opportunity to link the communities to the regional pathway system to the northwest, Fish Creek to the northeast and along Pine Creek to the southwest and southeast (Figure 3.23). Complying with standard regulations, this area could be comprised of the formal pathway system and have a hard-surface, multi-use function. In cases where both recreation and transportation cannot be accommodated, recreation receives the higher priority within the formal pathway system (City of Calgary Parks & Recreation/Transportation Department, 3-4), but this would be considered in combination with the high priority of ecological function in natural environmental areas such as the wetlands. As well as the formal pathways system, trails can be used in sensitive natural areas. The linkage to the community is via local pathways that enable residents to access key destinations such as schools, parks, transit and community centres (City of Calgary Parks Department 2003, 20).

3.6.7.3 Natural Environmental Park

Also of note is the natural environmental park option of which the ER lands would mostly be comprised. The wetland regions would likely be protected as either Major Natural Areas or Supporting Natural Areas as defined by the Natural Area Management Plan (City of Calgary Parks & Recreation 1994, 58-61) and would be managed to protect the ecological elements over and above recreational needs. If the area was designated a Major Natural Area, active recreation use would be restricted to the formal pathway while Supporting Natural Areas can support unrestricted recreational use (City of Calgary Parks & Recreation 1994, 80-81).

3.6.7.4 Stormwater Management

Finally, stormwater management has been incorporated into public open space because the City of Calgary has mandated that all new communities must treat their stormwater before it enters waterways (City of Calgary 2002b, 43). The Open Spaces Plan identifies current practices as: wet ponds, dry ponds, wetlands, source control, lot drainage patterns, storm conveyance methods, swales, trenches and end-of-pipe practices. However, these systems

may not be located on ER lands, but instead they should be on MR lands unless they comprise more than one-third of this land in the community. If this is the case, stormwater management lands need to be located on public utility lots. Furthermore, dry ponds may be located on school sites, sports fields, and any other MR land, but wet ponds may not be located on MR dedicated to schools (City of Calgary Parks Department 2003, 58-61).

3.6.7.5 Summary

Scenario A illustrates the constraints of MR lands under conditions of high population density. Considering that the density is eight units per acre – which is considerably higher than many new suburbs today – the requirements for schools in Pine Creek Villages are higher than other communities. Thus, land left over from schools sites is small and only a few forms of public open space can be accommodated. Under this situation, it is important to focus on the active recreational needs of the community through various park typologies. The constraints of public open space under Scenario A suggest that alternative land uses and combinations should be considered in the design of community services.

3.6.8 Scenario B: Joint Use, TOD

Under Scenario A, the MR available to public open space is drastically limited. Use of alternative approaches to planning will result in a community that has more accessibility to community services and amenities; thus, making the community highly valued. Combined use of sites, for example schools, does not reduce the land available to the school. Instead, it creates space that it available and enticing to all members of the community. Under current practices, school grounds are available to the community after school hours, but these sites do not have the amenities that many community members may want to enjoy. Using joint use sites and designing them in such a way as to provide recreation for all people will improve the public open space for the entire community. In this new scenario, the focus is still on active recreation, but with an integrated network of public spaces throughout the community and by making space available to alternative activities.

3.6.8.1 Joint Use Sites

The Joint Use Agreement allows the school and community centre sites to be openly available to the public open space system. In this way, land is used more efficiently and gives access to all people within the community. By combining public and separate school sites, elementary with junior high schools, high schools with libraries, and community centres with parks, the public open space allotment increases from 48 acres to a maximum of 187 acres (Table 3.11). Under this situation, all land in excess of the building footprint is designated public open space, but because of this joint use the physical land still remains available to the schools and community centres et cetera. A more moderate figure could be found by leaving some field/playground space as "school site" while combining the remaining with public open space. Regardless, the increase in public open space is dramatic and provides opportunities for linkages.

In addition to the increased public open space and traditional park designs, alternative practices could be undertaken that would improve the quality of this public space. Currently, there are provisions for many of these ideas, but practice has not yet incorporated the ideas into new suburban developments.

3.6.8.2 Stormwater Management Changes

Under current practices in Calgary, stormwater management regulations stipulate that wet ponds may not be adjacent to school sites. However, Scenario B recommends combining stormwater management with other uses especially high school and junior high school sites for recreation and education purposes.

3.6.8.3 Urban Plaza

Creating urban plazas at community nodes can spark community vitality. These spaces only require approximately one acre of land (City of Calgary 2000, 142) from the MR and if designed with human scale elements such as public art and walkability, they can foster community spirit. Urban plazas are spaces that accommodate alternative needs from the ones

met by active recreation parks (City of Calgary 2002c, 5). These are spaces in which the community can gather for festivals, exhibits, concerts and markets, but they can also be used for informal gatherings (City of Calgary Parks Department 2003, 58). The urban plaza supports the community node by providing a focal point for the entire community.

Comparison of Total Land Requirements for Scenario A and Scenario B			
	Scenario A Land Required (Acres)	**Scenario B Land Required (Acres)**	**Land Saved (Acres)**
MR Requirements			
Elementary Schools (CBE)	120	16	
Elementary Schools (CCBE)	45	NA	
Elementary/Junior High Schools (CCBE)	36	NA	
Joint Use Elementary & Elem/Junior Schools	NA	56	129
Junior High Schools (CBE)	60	20	40
Total MR School Requirements	261	92	169
Community Centres	24	6	18
Total Requirements for MR	**285**	**98**	**187**
Land Available for Public Open Space	**24**	**211**	**187 (Gained)**
Other Land Requirements			
High Schools	40	12	28
Library	2	0.5	1.5
Fire/EMS	4	---	
Police	3	---	
Tri-services	---	4	3
Medical Clinics	3	3	0
LRT Parking	9	5	4
LRT Station	2	2	0
Total Other Land Requirements	**63**	**26.5**	**36.5**

Table 3.11

3.6.8.4 Employment Centre Park

The inclusion of a significant employment centre in Pine Creek Villages means that many people from the area will not need to leave the community for employment opportunities. Thus, it makes sense to design the public open space system and the natural environmental

areas to provide recreational opportunities near this workplace. This park space could be taken from the MR – if there is any available – and the ER or additional space could be negotiated with the employment centre developer. The employment centre park would be similar to the urban plaza in that it provides a focal point to the employment centre, enables gathering of employees and recreation opportunities (City of Calgary Parks Department 2003, 58). Furthermore, it would create a node for public transit and retail that draws people to the area.

3.6.8.5 Community Involvement

Community involvement is a significant element of public open spaces and is not fully addressed by the current uses of these spaces. Alternative public spaces uses, such as community gardens, enable these spaces to be used for more than traditional recreation. It is important to recognize that not all people use public open spaces and providing diverse activities will encourage interaction between community members and improve overall quality of life in these areas. Another option especially important for Pine Creek Villages is encouraging public stewardship of the park system and the wetlands. Programs like Adopt-A-Park which depend on volunteers from the community to maintain parks through conservation, research, education, stewardship and general maintenance encourage community involvement (City of Calgary Parks & Recreation 1994, 79). Programs such as this are in accordance with statements from the Calgary Plan such as, "[e]ncourage stewardship and informed public, corporate and/or community participation. Also encourage partnerships in acquisition, management, research and protection of appropriate natural environments" (City of Calgary 1998, 25). The inclusion of management policies that are directly linked to the community will support the vitality of public open space into the future.

3.6.8.6 Green Roofs

Moreover, green roofs should be encouraged in Pine Creek Villages because they provide additional green space. Although this space is not public open space, it does provide

additional space for recreation within the community. Green roofs can improve community life through environmental benefits while creating additional green space especially in areas removed from the abundant ER lands.

3.6.8.7 Wildlife Corridors and Buffers

Finally, Pine Creek Villages should consider the role of wildlife corridors and buffer areas in public open space. With more land available under Scenario B, a major linkage should be provided in the north portion of the area to enable wildlife to move between wetlands as well as other environmentally significant areas[9] (Figure 3.24). Currently, Priddis Slough is home to the American Badger – a species identified as sensitive by the Government of Alberta – and without appropriate habitat and corridors this species may not be able to survive in the area (Manderson 2004). Furthermore, under the current policies only the two major wetland areas are set aside through the ER. Yet, the Wetlands Conservation Policy Draft identifies several other wetlands in the centre of the area that could be included in the ER. If the Wetlands Conservation Policy is approved before the development plan for this area, additional lands will be included in the ER. This is not to say that the area will be pocketed with ER because these additional wetlands are in poor condition due to agricultural impacts and would not be sustainable in an urban environment. Thus, additional ER allotment would be negotiated as additional space near the sustainable wetlands in the area (Manderson 2004). These spaces would be used as a buffer to the wetlands because adjacent housing has been found to negatively impact wetlands. As well, wetlands provide perfect habitat for mosquitoes and

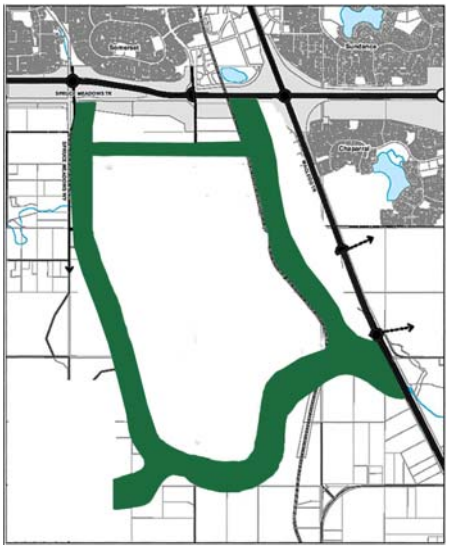


Figure 3.24: Wildlife Corridors

[9] These areas must have the potential to survive in an urban environment and are created to conserve areas of environmental significance and biodiversity with providing opportunities for education and recreation (City of Calgary 2002b, 78)

other residential pests so a buffer should be created to avoid conflict (City of Calgary Parks & Recreation 1994, 87).

3.6.8.8 Summary

Through innovative joint use sites, enough public open space emerges to consider alternative activities and uses of the land. The inclusion of stormwater management, urban plazas, employment centre parks, community involvement, green roofs and wildlife corridors/buffers gives Pine Creek Villages a multitude of options for interaction, recreation, education and enjoyment of the natural amenities this community is so fortunate to have. The network that is created between these public open spaces is linked through pathways and road systems ensuring accessibility for everyone while creating community and neighbourhood focal points.

3.6.9 Conclusion

Through the two scenarios presented, it is obvious that joint use sites will be highly valuable in improving the public open space amenities for Pine Creek Villages. The increase in land from 48 acres to 187 acres for public open space allows for more opportunities and a diversity of activities. Instead of strictly focussing on active recreation – as in Scenario A – Scenario B enables the community to provide recreation for all people, all ages, and in all seasons. It is this flexibility of space that will truly identify the area as unique and ultimately will entice people to live and participate in this community. In addition to the variety of activities, the joint use option enables using public open space to create linkages between parks, schools, community centres and community nodes. The incorporation of green linkages brings the amenity of the ER into the community and creates relationships between the distinct neighbourhoods.

3.7 Recommendations

Following the analysis of both Scenario A and Scenario B, some recommendations have been identified that will aid in optimizing the characteristics of Pine Creek Villages. The following are recommendations for community services within Pine Creek Villages:

- promote transit oriented development;
- create community and neighbourhood nodes for transit, facility accessibility and social opportunities;
- embrace joint uses sites;
- integrate buildings/sites of both the public school board and the separate school board;
- incorporate ER sites and stormwater management locations with High Schools and Junior High Schools;
- phasing of school sites should be dependent on the actual population requirement and not estimates for the entire area;
- after 20 years, review MR school lands that have not been used and ensure that decisions whether or not to return this land to the general MR is completed by 25 years10;
- protect wetlands and wildlife corridors; and
- increase the MR allotment for suburbs with a population density greater than seven units per acre11 and encourage use of other tools to acquire MR lands.

Based on these recommendations and the requirements of Scenario B, a concept map has been developed for Pine Creek Villages. In this concept map, each community has access to a diverse range of facilities which provide ample services (Figure 3.25). The development of

[10] This should address concerns that the school board requirements are over estimated; thus, returning land to the community if these spaces are deemed unnecessary.

[11] The MGA stipulates that the MR can be increased by five percent of the developable land over and above the original ten percent if the density is 30 units per hectare (approximately 12 units per acre) (MGA s.668).

this map is based on the interrelationships between the major nodes such that the community nodes service the local area, the Pine Creek node services the whole development and some facilities like the employment centre service the regional area (Appendix E).

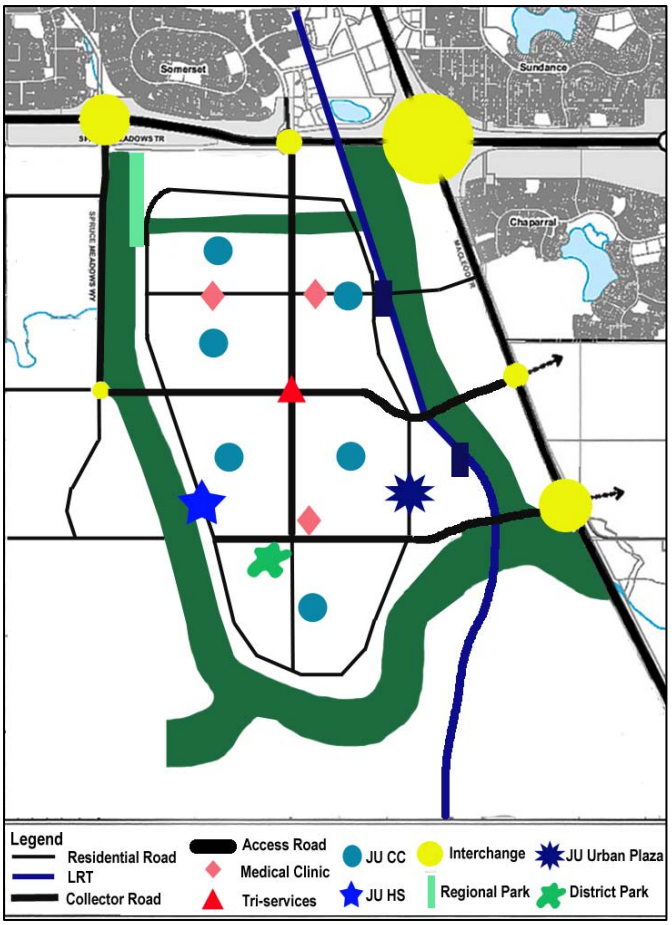


Figure 3.25: Concept Map[12]

Scenario B is recommended because:

- socially:
  - it creates more opportunities for residents to come together and interact; therefore, it helps to create a strong sense of community;
  - it responds to the needs of a diverse community and provides opportunities for dynamic change;
  - accessibility and education play a key role in the community through the combination of activities and land uses;
- economically;
  - it saves land, infrastructure and building maintenance costs; therefore, it reduces the financial burdens of the city and the community;

[12] The JU CC is the joint use community centre with elementary or elementary/junior high school. The JU HS is the joint use high school with ER. The JU Urban Plaza is the joint use high school with library and an urban plaza combining retail with access to the LRT.

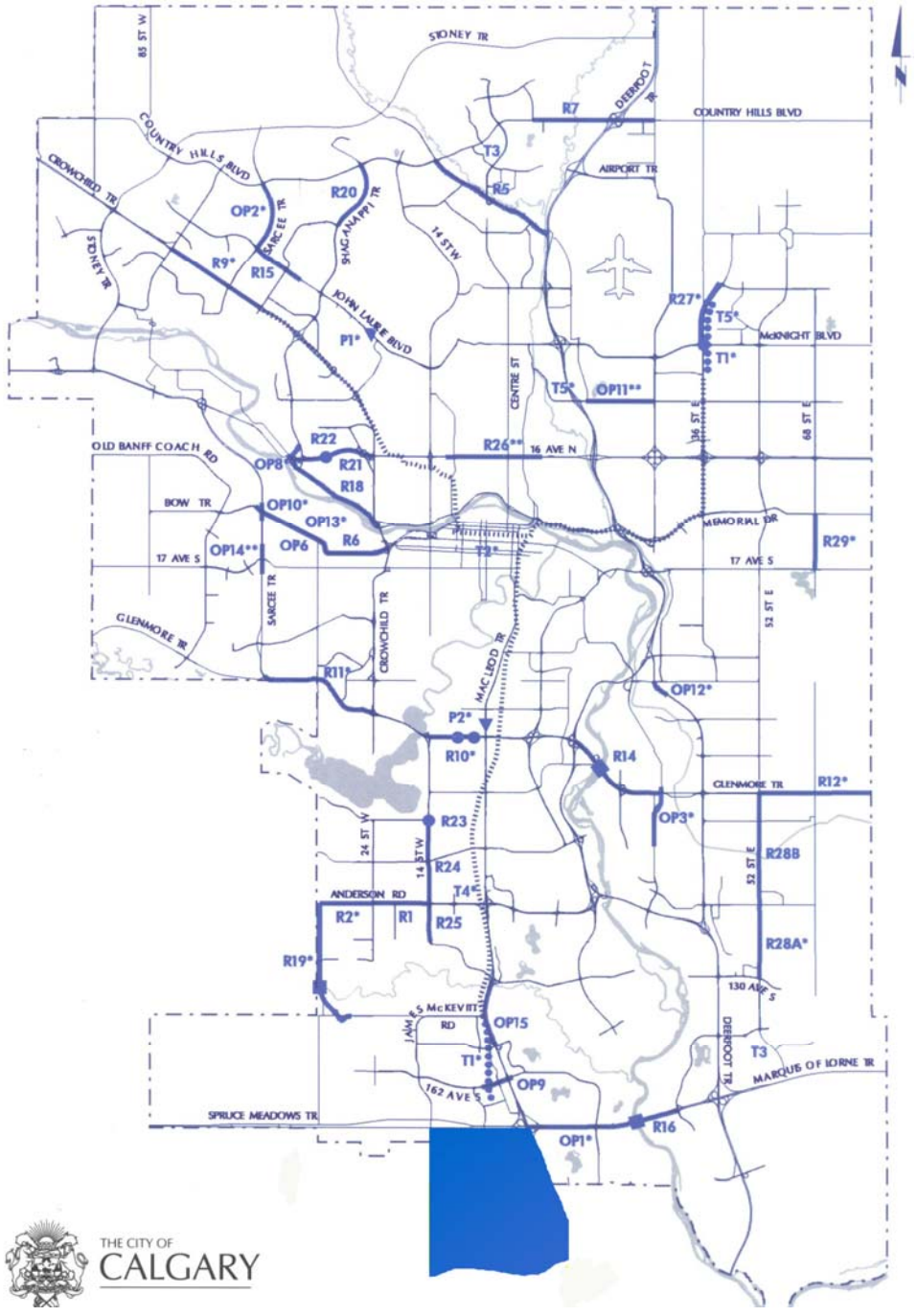
- environmentally;
    - it creates more open and green space; therefore, it contributes to a healthy environment and habitat for wildlife; and
    - it provides convenient transit and alternative transport modes which reduce air pollution emissions.

3.8 Conclusion

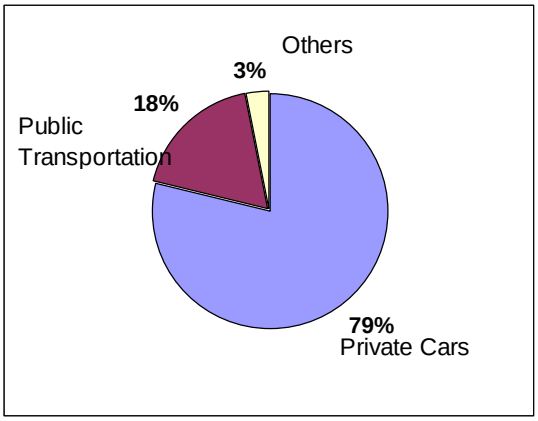
Based on the recommendation to use Scenario B, Pine Creek Villages will benefit in multiple ways. The use of TOD will enable the community to conveniently access facilities within the community and the city without vehicles. The proximity of the employment centre means that many people will not have to leave the area for employment; therefore, alternative modes of transportation will also contribute to more pedestrian friendly streets. Furthermore, the linkages through public open space will foster cycling and walking as modes of transport. Providing school sites that are linked to libraries and wetlands encourage life long learning and integrate schools into the neighbouring community. Although school sites are currently available to the community after hours, in the joint use arrangement these sites will provide for recreation activities to people of all ages. As well, the ability to encourage alternative public open space will allow civic pride to be displayed in different forums from the traditional park. Essentially, the diversity and accessibility of services throughout the community under Scenario B will inspire interaction and community spirit.

3.9 Annex

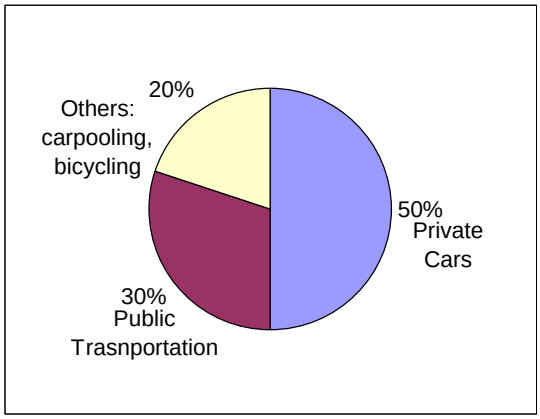
3.9.1 Appendix A: Calgary Context



3.9.2 Appendix B: Modes of Transport



Scenario A: Modes of Transport
(City of Calgary Transit 1991a)



Scenario B: Modes of Transport
(City of Calgary Transit 1991a)

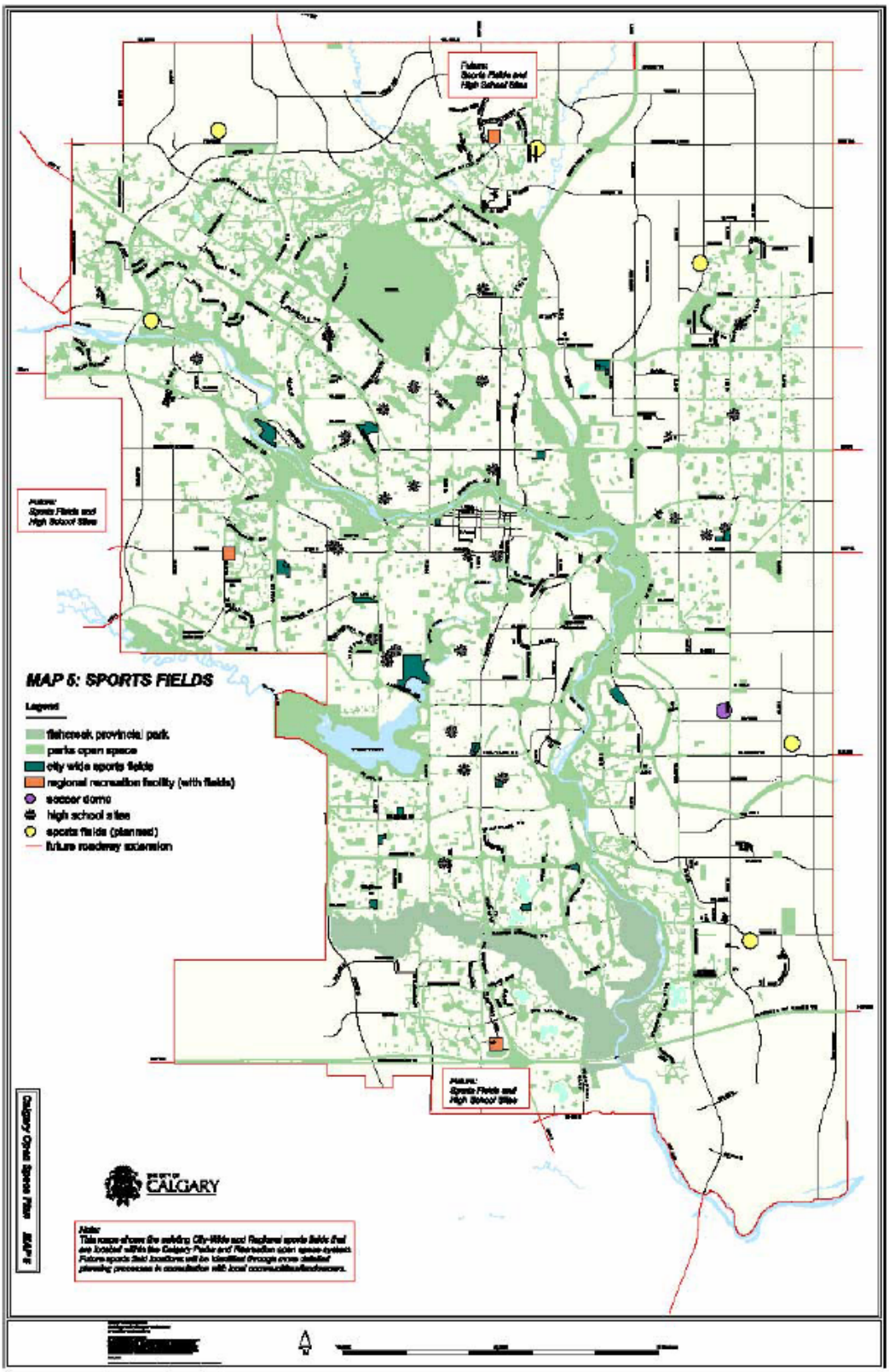
3.9.3 Appendix C: Fire, Police and EMS Requirements

	Fire station and Emergency Medical service (Normally a EMS station is housed within a fire station)		**Police district office** (a stand-alone site)	**Tri-service**
	Temporary site	**Permanent site**		
Land requirement	1 acre	3-4 acres 12,000 sq ft of building	3 acres 20,000 sq ft of building	4 acres 35,000 sq ft of building
Response time / Thresholds population	6 minutes response time for Fire Service, 8 minutes for EMS		Threshold population = 80,000	6 minutes response time Threshold population = 80,000
Location	The site must be located on a major roadway with duel direction access. A corner location is preferred.		Should be highly visible.	Should be located at the centre of the plan area, highly visible, along a major roadway, and a corner location is preferred.
Linkage/ Integration	A joint-use site is recommended for tri-service and social services like animal and bylaw services may also be included.			

3.9.4 Appendix D: Calgary Regional Park Distribution

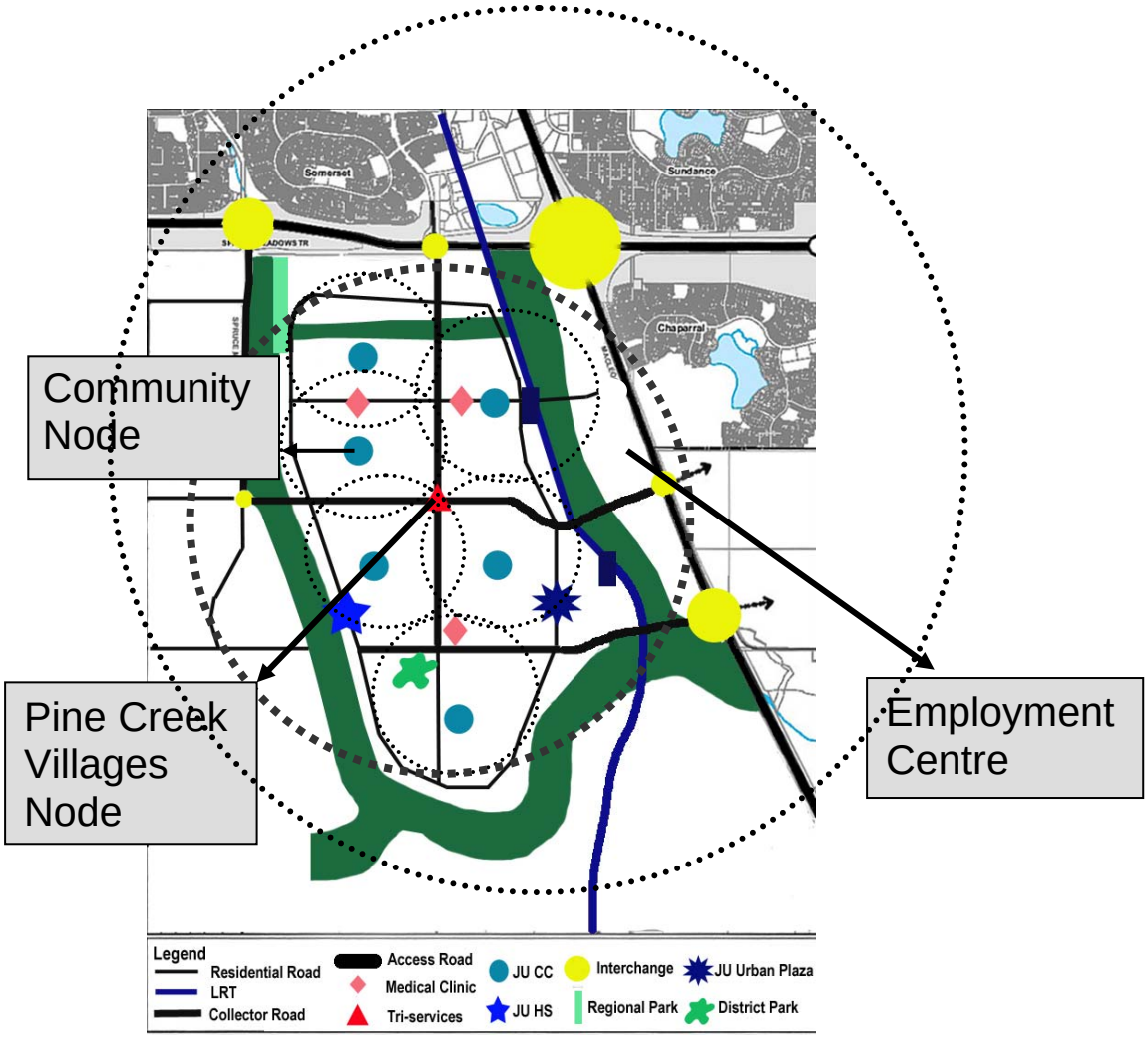
Calgary SW Regional Parks include:

- “Barclay Mall, 3 St. & Riverfront Ave. S.W. (Eau Claire area)
- Battalion Park, 3001 Signal Hill Dr. S.W. (west of Sarcee Trail)
- Central Park, 4 St. & 13 Ave. S.W.
- Century Gardens, 8 Ave. & 8 St. S.W.
- Clearwater Park Tipi Camp, 7.2 km west of Sarcee Tr. along Highway #8
- Devonian Gardens, 317, 7 Ave. S.W., 4th level TD Square
- Edworthy Park, 5050 Spruce Dr. S.W. (Bow Tr. & Spruce Dr. S.W.)
- Fish Creek Park (Provincial Park), 1840 160 Ave. S.W.
- Glenmore Park (north), 7305 24 St. S.W.
- Glenmore Park (south), 90 Ave. & 24 St. S.W.
- James Short Park, 115 4 Ave. S.W.
- Nat Christie Park, 14 St. & Bow Tr. S.W.
- Peace Park, 2 Ave. & 8 St. S.W.
- Prince's Island, 4 St. & 1 Ave. S.W.
- Reader Rock Gardens, Macleod Tr. & 25 Ave. S.W.
- River Park/Sandy Beach/Riveredge, 4500 14A St. S.W.
- Rouleauville Square, 17 Ave. & 1 St. S.W.
- Sein Lok Park, Riverfront Ave. & 1 St. S.W.
- Stanley Park, 4011 1A St. S.W.
- Weaselhead Flats, 66 Ave. & 37 St. S.W.” (City of Calgary 2004g)



(City of Calgary Parks Department 2003, 109)

3.9.5 Appendix E: Conceptual Map: Relationships between Neighbourhoods, Communities and the Employment Centre



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