

Urban Regional Structure of Contemporary Canada: the Case of Calgary

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Introduction

If someone asks me to line up candidate cities that have recently expressed high economic development and rapid population increase in the contemporary Canada, Calgary will certainly be included among them. No one could expect that Calgary, a small town born in the western interior of Canada only one century ago, developed so much. When we wonder why this city could develop so much in such a short time, we encounter some interesting facts that suggest the secret of urban development. One is the fact that the base of urban development has sequentially changed. Calgary provides a typical example for urban development model that is taught in the class of economic geography or urban geography of the university. The other fact is that Calgary can be regarded as an exceptional case which escapes from the core-periphery model discussed frequently in the field of economic geography or regional economy. Calgary has a potential to develop independently even in the peripheral area in term of geographical situation of Canada. The dynamism is the most representative characteristic that describes the urban development of Calgary, and there is no better example for showing how a city has changed so much in a short period than Calgary.

As an observer, I can easily recognize that citizens, companies and government of this city eagerly work on together for better living under a sever circumstance of physical condition and social diversity. Urban infrastructures have been enhanced to adapt the natural condition of winter climate and mountainous terrain close to the Rocky Mountains. Many ethnic groups immigrating from mainly Europe and Asia have sustained economic development, and have overcome a lot of cultural conflicts occurring among the ethnic groups. With a prior and cautious planning, each social class has cooperated to protect from the urban problems that are subject to occur because of a rapidly economic development.

In this study on the regional economy and urban structure of Calgary, the economic development based on agricultural and mineral resources will be analyzed, and the urban development sustained by these will be clarified. From a geographical and urban economic point of view, a success story will be told about the interesting process that only a small town on the great plain east to the Rocky Mountains has grew in a short period. Resource use, advanced technological development, multiculturalism and sustainability, which are important key words for the urban development in the 21 century, are necessarily used to make mention of Calgary. The urban and economic growth beginning from the past to the future will be discussed to show that Calgary is not only a development centre based on the resources existing in the periphery but an economic core area with dynamic society.

I Urban Economic Base and Urban Development

1. Inauguration of Urban Settlement and Agricultural Economy

Calgary, the largest city in Alberta, is located on the plain east of the Rocky Mountains. The elevation is 1,048 meters (3,340 feet) above sea level downtown, and the average temperature is +16.5°C in summer, and -10.9°C in winter. Calgary receives an average of 437.1 mm of precipitation annually, with

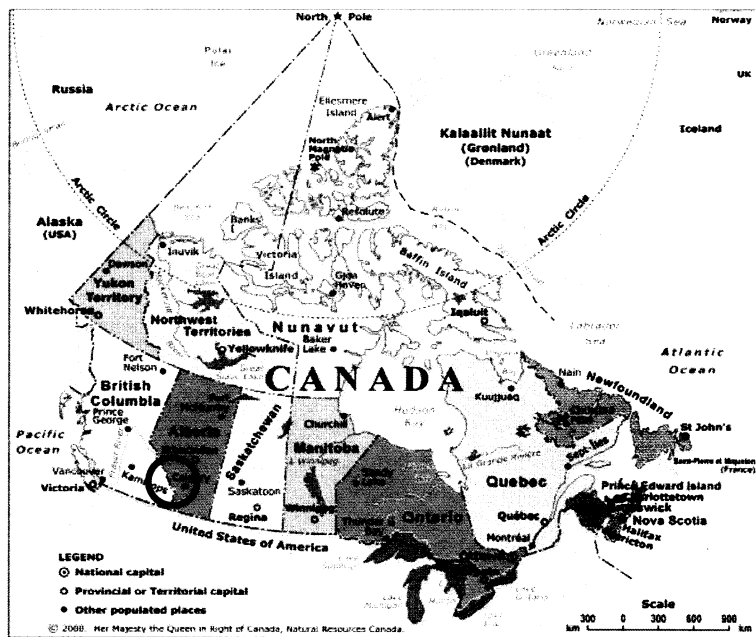


Figure 1. Canada and Calgary

301 mm of that as rain, and the remainder as snow. It was the end of the 19th century that a urban settlement emerged in this area just after the completion of the transcontinental rail line. In 1883, Canadian Pacific Railway came to Fort Calgary, the settlement centre at that time, from the eastern area of the country. The station was opened near the crossing point of the Bow River and the Elbow River. There was a trade post at this site for the commercial transaction between native people and merchants. Merchants wanted to exchange liquor for natives' furs. A network of trading post was allocated in the southern Alberta. The first post was located near Glenmore

reservoir, and the second one was opened at Fort Calgary in 1875. The post was called Fort Calgary next year. CPR started regional development from the station, and with this the first town was established in Alberta. This town became a city in 1893.

It was cattle breeding, agriculture and transportation centre that characterized Calgary at the beginning of the 20 century. Cattle were bred by open range system on the undulating plain near the Rocky Mountains, and meat packing was inaugurated. A cold wave hit this area seriously in the winter of 1906 and 1907, and changed the open range system into the closed system. Money crops centring on wheat were introduced in the central and southern part of Alberta. This cultivation brought about a great success to the farms. With this, population increased and doubled during a decade from 1901. The importance of transportation centre was the extension of railway centring on Calgary as a main bifurcation. Colonization proceeded around Calgary, and commodity flow between the city and its surrounding areas increased. But the immigration boom was over in 1912, and the development of Calgary slowed down after that.

The transcontinental railway was extended from Calgary and attained to British Columbia finally. B C, a colony at that time, promised to join the federation on the premise of the arrival of railway. It was the construction of transcontinental railway, the conclusion of treaties with native Indians and the establishment of Northwestern Mountain Police that constituted the national policy of federal government. Transportation infrastructure, public security and the keeping of agricultural land were urgently needed in order to expel the menace from the United States and to carry out smoothly the western development. It was necessary for the country as a whole to escape the conflict with natives and facilitate agricultural development with immigrants peacefully. The increased population by the western development was regarded as a new market for the eastern manufacturers. Agricultural products from the western area were exported abroad and could make a great contribution to the



Figure 2. Canadian Pacific Railway

national finance with the increase of foreign currency. It can be said that Calgary's development at this period could be realized with the national policy of federal government.

2. Extension of Railway and Socioeconomic Development

With the agricultural development, railways were extended centring on Calgary as bifurcation. Machine companies and finance businesses based on Calgary went into the rural area for business chance. From the rural area, agricultural products were exported to the market by train. Because of climate change and economic fluctuation, stable growth could not be expected in the rural area. The population of Calgary increased from 12,000 in 1906 to 44,000 in 1911. It finally attained to 100,000 in 1947. However, it should be noted that the population could not increase continuously during this period. It decreased during the Great Depression.



Figure 3. Downtown of Calgary
(Early 20th Century)

Most of people who came into Calgary at this time were English speakers from eastern Canada, English, and American. The population constitution by ethnic origin in 1901 indicated that English occupied 80.2percent of all. Either German or Scandinavian accounted for 4.5percent, and French 3.0percent, Asia 2.6percent, Native 2.6percent. At that time, conservative local government was sustained by the cattlemen who were conservative and ranked as the upper class of the society. After the establishment of the state of Alberta in 1905, they became a political power sustaining the state government. They could not join the mainstream in a

national scale because Liberal Party had political control all over the country. Even in Alberta, Liberal Party continued to be dominant until 1921. Under these circumstances, the hardhats in Calgary established non-political organizations to show their presence. United Farmers of Alberta that was established in 1921, Co-operative Commonwealth Federation in 1932, and Social Credit Party in 1935 were included in them.

As mentioned above, CPR contributed to the regional development in the early days. Among several railways originating from Calgary, the railway constructed during the period from 1891 to 1992 for connecting Calgary and Edmonton played the most important role. Two years later, a new railway to Fort Macleod was opened. As residents along the railways expected Calgary to bring them commodities, Calgary could become the first wholesaling city in Alberta. In 1898, a railway was constructed to attain to Kooteney, eastern British Columbia. Kooteney, a development centre for mining and forestry, supplied a local market for dairy products. In addition to CPR, Canadian Northern and Trunk Railway came into Calgary in 1914. Calgary as a new city could be geared up to cope with Winnipeg that had been the head of wholesaling centres in the western interior for a long time.

The opening of repairing yard by CPR strengthened the status of Calgary's transportation centre. CPR worked out Ogden Shop Agreement with the City of Calgary. Under this agreement, the City promised to extend municipal streetcar for CPR in return for the establishment of the repairing house. The construction of this house created the employment of 15000, and 5000 workers could have jobs there after the completion of this facility. Transportation related facility as well as wholesaling and storage industry contributed to the economic development of the city.

Agricultural production started in this pioneer fringe at the same time of the establishment of Alberta.

Until 1910, about 3.3 million acres were cultivated all over the state of Alberta. Firms aiming to sell agricultural machines and financing in the rural area were agglomerated in Calgary, and the industrial accumulation of the city became accelerated. In addition to this, fairs and expositions were held annually to show cattle breeding, and the visitors to Calgary increased. The Dominion Fair, a national scale festival, was held in 1908. The establishment of the irrigation control centre in Calgary made the city's status clear as the centre for leading agriculture and cattle breeding industries.

With the accumulation of urban functions, Calgary went into a construction boom. The boom starting from 1906 to 1912 was more that expected by far. More than a quarter of all workers was estimated to work in the construction work. Estate agents such as F.C.Law changed the urban landscape of Calgary. However, the boom came to the end in 1914, and thousand of workers lost their jobs

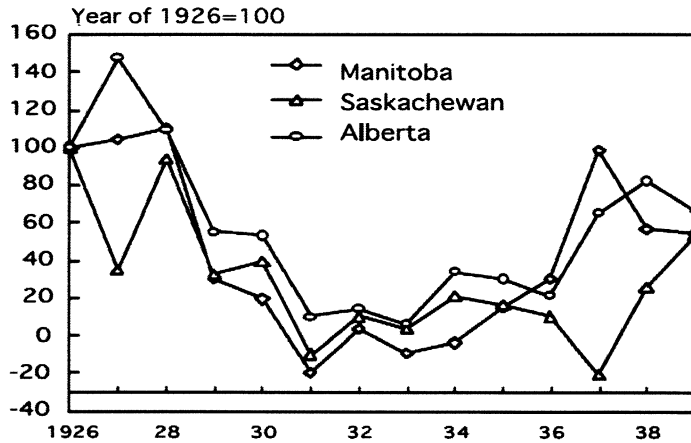


Figure 4. Change of Per Capita Income of Three Western Interior Provinces

After the end of WWI, Calgary and southern Alberta were seriously hit by the depression, and went into a miserable economy. Immigration boom had already gone over, and drought damage, inflation and the decline of crop's price aggravated the regional economy. This resulted in the loss of 55percent of total population in southern Alberta until 1926. It was said that 80percent of farmers in Alberta became bankrupt before 1923. Ravaged economy in the rural area influenced seriously on Calgary's economy that was sustained by such a hinterland. The increase of unemployed people, price rise,

rapid decline of tax revenue and the drop in the value of property confused the city's economy. It was only two years, 1928 and 1929, that the economy was in good condition during the period from 1914 to 1940. Long-term depression drove the agricultural region into a difficulty, and cattle breeding also faced with the difficulty to continue to grow as before. It was symbolic for Calgary that the repairing house of CPR was shut down. With this, unemployed people increased in number rapidly.

3. Development of Oil and Gas Industries and Change of Urban Structure

In 1914, a historical event that determined the characteristic of contemporary Calgary occurred in Turner Valley, south west of the city. Oil was discovered there, and businessmen such as W.S.Herron started oil well drilling. As oil was discovered in 1924 and 1936 in Turner Valley, too, Calgary became recognized as the development centre of oil and gas. The discovery of large-scale oil field in Leduc in 1947 enhanced Calgary's reputation further. With this as a turning point, Calgary changed from a local city in southern Alberta to an international metropolitan centre based on the resource development.

With the acceleration of oil and gas development, a lot of people came into Calgary to seek an economic business chance from all over the world. Oil and gas related firms were established by and by, and it became clear that Calgary was the international centre for oil and gas development. Calgary exceeded Edmonton in the agglomeration of firms when the headquarter offices counted 965 in 1956. Among many organizations related with oil and gas development, Canadian Petroleum Club established by Canadian and American businessmen in 1948 was regarded as a core organization.

International capital lead mainly by American firms committed the oil and gas development from the first, and local and external capital were engaged in a melee. Home Oil Company was the firm that was managed by only Canadian capital. R.A.Brown's son established this company in 1955. Brown discovered oil in Turner Valley.

American and English oil capital came into Alberta in a large scale from the end of 1940s to the 1950s. The discovery of oil in Leduc in 1947 triggered this movement. Oil reserve there was estimated to be 200 million barrels, and there was a possibility that unknown resources lied under the ground. Oil companies from US and England continued to search oil field and succeed in discovery continuously. Main oil fields are as follows:

Redwater,1948; Golden Spike,1949; Fenn-Big Valley,1950; Wizard Lake,1951; Acheson, Bonnie Glen and Westeros,1952; Pembin,1953; Swan Hills,1959; Rainbow Lake. It should be noted that new gas fields were discovered, too. Natural gas fields in a large scale were continuously discovered near Calgary through the 1950s.

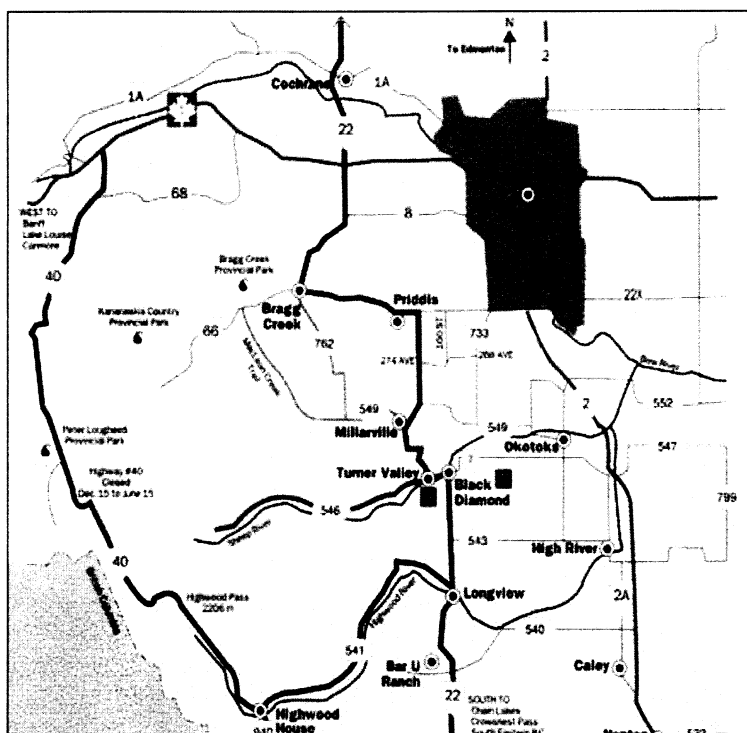


Figure 5. Location of Turner Valley



Figure 6. Oil Field in Leduc

Even after WWII, agriculture was still an important industry for Calgary. In contrast to this, manufacturing lost the importance under over of the outstanding development of oil and gas industry. Construction and service industries emerged as if they complemented the decline of manufacturing. Construction especially thrived because a lot of office buildings were constructed during the boom. However, the boom could not last long, and constructing industry could not help escaping from the boom-and-bust-cycle. In any way, some real estate agents

succeeded in accumulating thousands of money thanks to the construction boom. Workers engaged in the construction work exceeded 10 percent of all the employees. High-rise and middle-rise buildings that were newly built in the downtown changed the urban landscape drastically. In addition to the office buildings, shopping centres and public facilities were built, too. Calgary Tower, which is now the landmark in the downtown, was constructed in the southeast part of the downtown in 1965.

City area, which was only 40 square miles in 1940, expanded to 155.8 square miles in 1965, four times as much large as 25 years ago. During the same period, population increased from 87,000 to 311,000. Growth rate was the same as that of the area. Although population increased in Alberta as a whole, Calgary's increase exceeded any other areas. With this, the percentage of Calgary in population of Alberta changed from 11 percent in 1941 to 25 percent in 1965. This indicates how Calgary attracted much population from others. With the inflow of population, the social structure of Calgary changed. Population migration from US was noticeable phenomenon, and 30,000 immigrants crossed

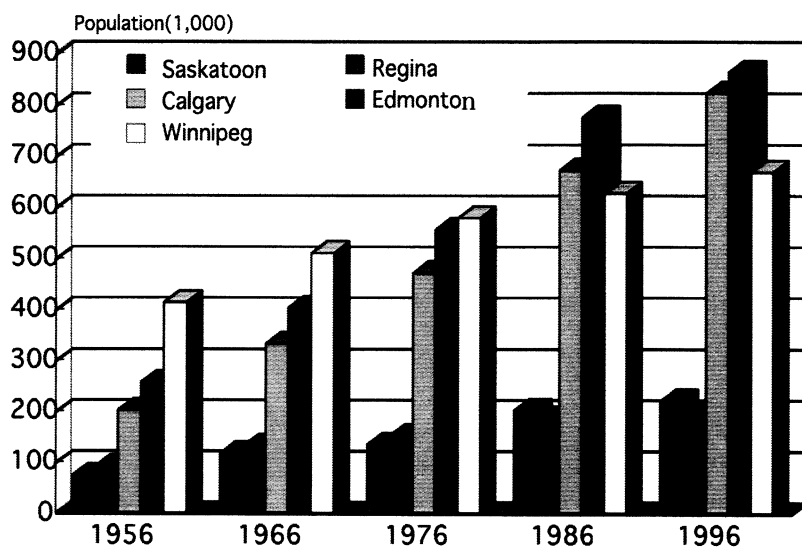


Figure 7. Population Change of Main Cities in Western Interior Provinces

the border to search economic wealth until 1965. White-collar engaged in clerk and management jobs occupied a large share in the downtown Calgary. It was definitely different from the on-site production of oil and gas. Workers engaged in high profit company could increase their income continuously, and this triggered the consumption in the city. High-income earners and middle class increased and with this, new social class, which was different from the local people, emerged.

Oil and gas industries needed a lot of young and career-grazed workers. Employees who could adapt to new environment were necessary in order to catch up to the rapid development of new technologies. High educational institution such as university should be enriched so as to bring up these human resources. A branch school of University of Alberta was established in Calgary in 1945, and it was only a high educational facility at that time. It was not enough for this branch school to supply high educational service needed from the business with its ordinal curriculum system. A series of educational reform were carried out to keep up with such demand. The improvement of facilities and educational system led to the establishment of the University of Calgary. It was apparent that the enrichment of the University's educational environment could be realized with the economic wealth from oil and gas industries. The financial resource from these industries was supplied to not only educational field but also public, cultural and institutional sector, which contained park, museum and research centre. A lot of municipal facilities were constructed with the donation from oil and gas industries. It should be noted that not only the agglomeration of offices in downtown but also urban infrastructure such as social, cultural and educational facilities were enriched with the development of oil and gas industries.

4. Economic development and problems since the 1970's

Young American businessmen and technicians with professional knowledge and ability came across the border during the 1960's and 1970's. It was 1971 that the progressive conservative debuted in Calgary as a new political party lead by P. Lougheed. He graduated from Harvard University and succeeded in providing a breath of fresh air with his colleagues. While promoting venturous economic activities, he tried to foster the conservative middle class to create a climate that people respect social conscience each other. With this, political governance transferred from the old power, the Social Credit lead by teachers, farmers and middle and small business owners, to the young middle class.

The economic performance was very changeable from the end of the 1970's to the early 1980's. The reason of such a volatile trend was that Calgary depended a lot on mono industry, oil and gas industry. In addition to this, the political conflict between local government and federal government aggravated the economic situation. Liberal Party controlled Federal government from 1968 to 1984, and there was an important political dispute concerning the policy of energy between local government and

federal government. This policy had an very important meaning for Calgary because it had a possibility to influence on Calgary's industrial structure. This dispute occurred by the Oil Crisis happened in a worldwide scale was fortunately terminated with the gradual decline of oil price. However, the decline of oil price meant that Calgary went into the depression. In the early 1980's, not only population outflow from the city but also companies's shut down occurred.

Needless to say, the economy based heavily on mono resource industry is very vulnerable. While it was difficult to change such an industrial structure drastically, the Olympic Winter Games in 1988 was the start of industrial diversification in Calgary. The Olympic Games attracted attention in world-wide scale, and the tourist industry based on natural resources characterized by the Rocky Mountains, the industries using forest resource and renewable resource and high technology industries as well as oil and gas industry were regarded as main industries that should be developed. The impression to Calgary changed from a mere developing centre in the western Canada to an international centre of not only economy but also society and culture.

The political dispute between local government and federal government, which was mentioned before, started from the different view of energy policy between two governments. With the artificial increase of oil price by OPEC, the eastern Canada suffered from economic damage a lot, because this area imported oil from other countries. Under these circumstances, federal government tried to impose the charge on oil for U.S. from the western area to cover the financial difficulty. In addition to this, federal government tried to heighten the percentage by Canada in developing oil and gas. A series of policy were based on the National Energy Plan initiated by federal government. Federal government's policy to restrain on the export of oil from Alberta to U.S. was unacceptable. As a countermeasure, the state of Alberta examined the policy of decreasing the oil transfer form the western Canada to the east. But as mentioned above, this political conflict became meaningless because of the decline of international oil price.

At the year of 1982 when the conflict of the National Energy Plan came to the end, there ware 638 headquarter offices of oil and gas in Calgary. They occupied 76 percent of all the oil and gas companies in Canada, and they covered many kind of industry such as research, drilling and refining. Calgary's share of oil consulting company was 76 percent, and 82 percent of geophysitian and 63 percent of drilling contractor were agglomerated in the city. In addition to this, 1,387 companies related with oil and gas industry had their headquarters in Calgary. Companies based on America, United Kingdom and northern European countries established most of these firms. The nature of businessmen working in the downtown Calgary were alike each other. These workers represented the business climate at that time and acted as the main agent that sustained Calgary's socio-economy.

Women, Jew and native people, who were outsiders of business world, were minority and never went mainstream. Office buildings brilliant in the downtown manifested the success of business in oil and gas industry. Most of them were buildings related with the successful companies in this industry. A lot of people in the downtown of Calgary walked through the main buildings such as Suncor, Shell, Gulf Square, ESSO Plaza, Pan Canadian and Petro-Canada. While the downtown space was filled with brilliance, it should be noted that there were many people who were unconnected with the economic success. In particular, about ten percent of Calgarians was under the poverty line in the early 1980's when the economic recession occurred. The rate of unemployment was about fifteen percent. Glenbow Foundation, which was established in 1955 to support art and cultural activities in Calgary, had a financial deficit and was forced to finish. The price decline of crops that were surplus production in a worldwide scale made worse such a situation. Both oil and gas industry and agriculture were easily affected by the international economy. As long as Calgary depended on such industries a lot, it could not escape from the fluctuation of international economy. The multilateralization of industry became the most important task for Calgary to cope with.

II Multilateralization of economic structure, urban events and behavior of oil companies

1. Trials to diversify economic structure

The local government of Calgary manifested the policy that tourism including forest resources and entertainment should be developed as well as oil and gas industry and agriculture in the near future. Tourism itself was not a new industry, and had been already started from the year of 1883 when CPR completed the railway through the Rocky Mountains. W.V.Horene, who was in charged with the management of CPR, recognized well the tourist value that the natural environment of the Rocky Mountains had. He had an idea that if rich people visited there from the eastern Canada, U.S. and U.K. economic success would surely be realized. In order to satisfy tourist, he opened parks along the railway and made the plan of building hotels and rest facilities into practice. His plan was supported by national government, and Cave and Basin Spring was designated as the first park in 1885. The Act of the Rocky Mountains National Park was established, and Banff was designated as the first national park.

It was not limited to the wealthy tourists that were attracted by the beauty of recreational resources such as Lake Louise and visited the Rocky Mountains. Artists, photographers, moviemakers and writers came, too. With this, the Rocky Mountains as a touristic site was known through mass media. At the same time, a movement to protect natural environment form tourists occurred, and federal government designated Jasper as the second national park in 1907 with the consideration of this trend. In 1911, Waterton was the third national park. With the diffuse of automobiles, tourists came by other transportation means as well as railway. While CPR managed to strengthen railway, it became popular that tourists visited by car with the development of road and automobile. Not only tourists from remote area but also residents living in the neighborhood visited for recreation and resort. With the increase of tourist demand, many facilities such as hotels, ski resorts, golf courses, pools and stores were constructed in the tourist areas.

In the 1980's, the state government of Alberta declared that it would promote tourist industry from a new viewpoint basing on the history of the Rocky Mountains as a tourist area. It was not the ordinal way setting recreational facility at each tourist site. It was the way planting tourist factor within the city itself or the way to make recreational atmosphere come out from the city. The Royal Tyrrel Museum and Alberta's Dinosaurs Provincial Park were the examples that the state made a strong effort to promote. These were unique facilities settled down on the fossil area and made use of the boom of Godzilla and Jurassic Park from television and film. Long ago, Alberta was covered with the shallow marshes and lakes, and a deposit pile of animate living there became the material of oil and gas. The process included the age of dinosaurs, and its evidence, fossil, remained to indicate that there lived



Figure 8. National Parks in the Rocky Mountains



Figure 9. Location Shooting in the City

many kind of animate. Drumheller near Calgary became a well-known tourist place where fossils were collected. It was different from the ordinal recreational areas around the Rocky Mountains.

The Rocky Mountains and its eastern plain have a suitable condition for filming of movie and television as well as sightseeing. It was the 1920's that Calgary was connected with filming of movie. While Valley of Silent Men was the film taken at Banff at that time, it was Rose Marie that achieved overwhelming financial success in 1936. This film also was taken in the town of Banff. As recent examples, Doctor Zhivago, Dance with Wolf and Unforgiven were films taken near Calgary. However, it was the film companies based on Hollywood that produced these films, and Calgary and its surrounding area were only the places for filming. Local film companies made a few movies before WWII. The theme of these films was Calgary's Stampede that had already become the

main annual event for this city.

In the 1980's, the state of Alberta established the Alberta movie corporation in order to foster the film industry. The corporation subsidized to film companies, technicians and talents for performing actively. Thanks to this, some films succeeded in winning award in the category of documentary. It was the 1990's that Calgary was taken in television not in film. North of sixty, Lonesome Dive, Byper, for example, were examples. Television festival held in Banff every June is the biggest event that connects Calgary and television. This traditional festival provides an occasion where a variety of trials are discussed and has contributed to the development of TV program. It is significant that the event is held in Banff, the heart of the Rocky Mountains. World's greatest natural environment is related deeply with the content services of TV as well as tourist services.

2. Economic effect of Stampede and Olympic Winter Games

Stampede is the biggest event held annually in Calgary. This is the event that combines Rodeo, parade,



Figure 10. Calgary's Stampede

agriculture fair, concert, etc., and is characterized by the image of cowboys in the age of exploring the West. This was originated from the agricultural fair started when CPR constructed the railway and the Rodeo festival that was initiated by an American manipulator of rope in 1912. Two events began to be held at the same time since 1923. Stampede is held for ten days of every July and has its own place at the southeast near the downtown. In 2005, 1.24 million

tourists from Canada and other countries visited the event. Audience to watch the parade marching the

central area of the city amounted to 0.35 millions. It is said that about 200 million people watched this parade on TV. A lot of tourists are attracted by the familiar image of the West, and the income from this event is not negligible. There are casino and market close to the Stampede place, and not a few tourists visit there without relation to the event.

The Olympic Winter Games held in 1988 made Calgary known as the place of Stampede even more famous. This was the second Olympic Games in Canada following the Montreal's Olympic Games in 1965, and was greatly expected by the local economy. Contrasting to the Montreal's Olympic Games that had aftereffects for a long time, Calgary succeeded in making itself better known internationally by this Olympic Games. The success of this Olympic Games was testified by the fact that one million surplus remained after the end of the games. A lot of volunteers joined the Olympic Games, and local companies and citizens had confidence from it.

Main facilities for the games were Saddle Dome close to the Stampede's place, the Olympic Oval within the campus of the University of Calgary, ski and bobsled areas along the trans-Canadian highway. These facilities have been used for training and recreation after the Olympic games. They are the places where international athletics are held every year, and visitors for these athletics contribute to the local economy. It is not limited to Calgary that municipality attracts Olympic Games in order to promote urban and regional economy. Calgary can be regarded as the city that succeeded in the attainment of its purpose to develop the urban economy.

3. Strategy of oil and gas companies located in Calgary

Although the multilateralization of industry has been promoted in Calgary, the rate of dependency on oil and gas industry remains high. Most of large enterprises located in the city are related with this industry. The profiles of main firms are as follow. EnCana was established in 2002, and has 4,090 employees. Its sales turnover amounted to 12.2 billion Canadian dollars in 2004. Company's name comes from the initials of energy, Canada and Alberta, and it indicates that this company is entirely based on Canadian capital. Pan Canadian Energy and Alberta Energy were the former companies, and merged into a new company in order to achieve economies of scale. It operates not only in the local area, Alberta and British Columbia, but also overseas such as Australia, Libya and Venezuela.

Petro-Canada is the Crown Corporation that was established by the federal government in 1975. The gas stations of this company were taken over from British Petroleum Canada, and the background of this is related with the Oil Crisis and the subsequent policy of Canadian government. Originally, American companies developed oil and gas resource in Canada, and the profit received by Canadian companies remained relatively less even when the oil price increased by four times. Main market of oil and gas was in U.S.,

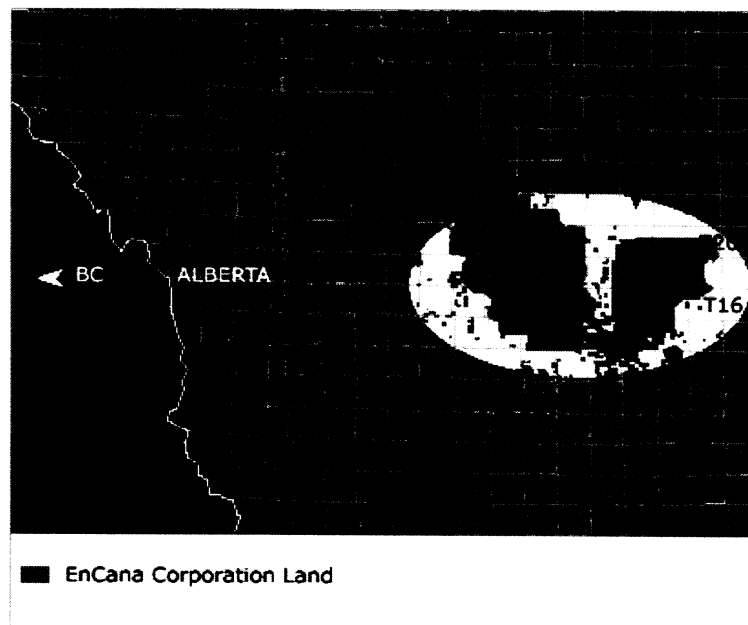


Figure 11. Development of Gas Field near Calgary

and Canada had few advantages. The Liberal Party, ruling party at that time, wanted to nationalize the development of oil and gas under favor of the New Democratic Party. The establishment of Petro-Canada was one of the results, and it has worked as a statutory company. But, with the decline of its role as a statutory company, this company was privatized partly and changed into a private company even though there remained a symbolic image of Canada. The number of employees decreased from eleven thousands to five thousands, and it ranks 24th in the country.

Shell Canada is a member of Royal Dutch Shell group, and gained sales turnover of 46 billions Canadian dollar in 2002. Its business consists of the drilling of oil and gas, wholesaling, retailing, and the sales of related products. It operates 1,800 gas stations all over the country. Imperial Oil is the company of which 70 percent of capital is owned by Exxon Mobil, and has 25 percent of capital of Syncrude Canada Ltd. by itself. This company is well known as ESSO Imperial, and sets a lot of gas station all over the country under the brand name of ESSO. This company also is known as the largest company of natural gas, and performs petroleum refinery and oil sale in a large scale. It produces chemical products from the oil extracted in Alberta and Northwestern Territory. Its affiliate company, Syncrude Canada, produces oil from the tar sand of which share in the world is the largest in Canada.

Syncrude Canada produces oil from the tar sand extracted in Fort McMurry, the northern part of Alberta. Suncor Energy managed by Canadian capital produces synthetic petroleum at the same place. It also develops and refines natural gas and sells products mainly in Ontario and Colorado. In Calgary, there are the headquarter offices that operate the development project of oil and gas only overseas. First Calgary Petroleum is an example, and has developed its projects in Northern Africa and Middle East. It is said that this company will shift the project site toward Algeria in the future. Husky Energy managed by the owner from Hong Kong develops oil and gas in China as well as Canada and U.S.

III Industrial development of information technology, tourist, transportation and communication and health

1. Main industries beside oil and gas and their trend

Large-scale companies located in Calgary belong to the industry of oil and gas, so most of workers in the downtown seem to be employed by these companies. Needless to say, there is no on site of development of oil and gas, oil refinery and sales in the downtown, and workers there are white-collars who are changed with the planning, control and management. Contrary to the presence of headquarter offices belonging to oil and gas industry, the number of workers in this industry is under 39 thousands. This number is calculated at the base of Calgary Economic Region. This region consists of Calgary and its surrounding area, and is nearly the same region as Calgary Regional Partnership: CRP. Calgary Regional Partnership contains the City of Airdrie, ten towns and five rural areas as well as Calgary. Calgary Census Metropolitan Area, which is frequently used as statistical purpose, is a little smaller than CRP.

As mentioned before, the number of employees working in the industry of oil and gas is under 39 thousands. This industry is included in the same statistical category as forest, fishery and mining, so it is impossible to know the accurate number of employees by the statistical data. Total number of employees in the economic region at the time of February 2005 was 625 thousands, and the resource sector centring on oil and gas industry occupied 6.2 percent of all. If total industries in economic region are divided into two, production sector of goods and services, the former has share of 24.0 percent and the latter 76.0 percent. As these figures indicate, service industries in a broad category occupy the main part of Calgary's industry. Such a situation is common among metropolises in

Canada. Wholesaling and retailing's share is the largest in the service category, and has 105 thousands of employees. Professional, science and technology service, the second, has 65 thousand employees. Social welfare care service (57 thousands) follows this, and construction (56 thousands), manufacturing (50 thousands), finance, insurance and real estate (42 thousands) follow further. Looking at the industrial composition by employee, it can be said that Calgary has a well-balanced industrial structure.

The number of employees in wholesaling and retailing is the largest. This represents the characteristics that Calgary stated as a regional central

town, and it is suggested that trade activities are related with the formation of commercial structure centring on the downtown. On the other hand, the fact that more than 60 thousand employees belong to professional, science and technology service indicates the agglomeration of headquarter functions in the downtown and the policy to promote advanced industries which will be mentioned later. Construction industry employs more workers than that of manufacturing. Construction, which has sustained construction projects during the 20th century, still has a presence. Manufacturing basically produces products for the local market and a variety of goods made by using local materials. Food and beverage, wood and furniture, and metal fabrication and processing are main products. From the 1990's, new trials started to make high value-added products in place of old and traditional manufactured goods. These trials are promoted not only in manufacturing sector but also in professional, science and technology service and education, and the role by producer service, university and educational institutions have become important.

Transportation and warehouse also are closely related with the urban development of Calgary. Transportation of passengers and goods was carried out by railway before, but at present, automobile and airplane are main. While the role of railway to transport passengers among cities has declined, city train and bus have an important role to carry a lot of passengers in the city. Recently, the headquarter office of CPR in Montreal moved to Calgary in 2000. Many industrial sectors beside railway have a strong power to attract firms basing on a growth potential. This can be said in the field of aviation service, too. Calgary International Airport has a presence, and is ranked as the third in term of the size of handling. While there is no category of tourism in the statistics, a great deal of hotel and beverage service, information, culture and entertainment are related with tourist. Information contains media such as newspaper, television and radio. There are four newspapers, six television centres and twenty-five radio stations.

Table 1. Employment Structure of Calgary Economic Region

Description	Location Quotient	Employ. Distribution	
	2003	Calgary	Canada
All Industries:	1.00	100.0	100.0
Agriculture:	0.41	0.9	2.2
Forestry, Fishing, Mining, Oil and Gas:	2.8	5.2	1.8
Mining and Oil and Gas Extraction:	4.5	5.1	1.1
Utilities:	1.1	0.9	0.8
Construction:	1.4	8.4	5.9
Manufacturing:	0.6	9.1	14.6
Service-Producing Sector:	1.0	75.6	74.6
Trade:	1.0	15.2	15.6
Wholesale Trade:	1.2	4.3	3.6
Transportation and Warehousing:	1.2	6.0	4.9
Finance, Insurance, Real Estate and Leasing:	1.0	6.0	5.9
Professional, Scientific and Technical Services:	1.5	9.8	6.4
Management, Administrative and Other Support:	1.0	4.0	3.9
Educational Services:	0.8	5.4	6.7
Health Care and Social Assistance:	0.8	9.0	10.7
Information, Culture and Recreation:	1.3	5.7	4.5
Accommodation and Food Services:	1.0	6.8	6.5
Other Services:	1.0	4.6	4.5
Public Administration:	0.6	2.9	5.2
Source: City of Calgary and Statistics Canada, 2004.			

If we look at the industrial structure of Calgary in term of the amount of production, we recognize the different characteristics from that of employee. The most evident feature is that the primary industry occupies 18.2 percent of total GDP. There is no such a metropolis in the country. The reason of this is that Calgary's metropolitan area contains rural area outside the city. The second, finance, insurance and real estate, has share of 18.0 percent followed by commercial service (14.7 percent) and manufacturing (10.5percent). Recent development of economy in Calgary can be seen not only in the number of employees but also in the volume of production. The number of employees increased by 4.3 percent every year from 1988 to 2001. The rate of increase was more than the average rate of 25 census metropolitan areas. This trend of development was the product of new investment in the field of energy, the increase of oil price and active consumption. According to the data of Alberta Economic Development, the construction projects in Calgary from 2002 to 2004 amounted to 85.8 billions Canadian dollar. Of them, 55.5 billions was for oil and gas industry. The improvement of Calgary International Airport cost 0.65 billions and the construction of the campus of Royal Mount College needed 0.15 billions. These investments influenced on Calgary's economy.

2. Industrial development of information technology, tourist and entertainment

It is hoped that the dependence on the primary industry and oil and gas industry is weakened and the multilateralization of industry is promoted in Calgary. Industrial advancement is recommended in the following seven sectors by Calgary Economic Development: CED, which is the organization for this promotion. It is a kind of non-profit organization where the presidents of private companies and consulting companies and administrators act as the directors. CED selected geomatics, information technology, tourism art and entertainment, transportation, warehouse and logistics, welfare and wireless and telecommunication as main industries for advancement. CED regards these industries as clusters and expects that these clusters inspire and collaborate each other to have many advantages. The economic growth as cluster is expected to contribute to the industrial development of Calgary as a whole. Total number of employees in these seven clusters amounts to 154 thousands at the year of 2000. It occupies 26.4 percent of all industries.

Geomatics is the industrial sector that aims to expand the way of measuring location and analyzing geographical information, and is regarded as the core technological field within the industries. It was originally developed in the field of oil and gas industry. As the data on region and environment are needed in many industries, the way of using them with advanced computer will be employed in many businesses. GPS, GIS and remote sensing are the sectors with potential growth at the moment. This industrial sector is developing in other cities, and its average number of employee per firm is under twenty. QC Data, the largest company in Calgary, has 110 employees. Main customers are telecommunication, electric power, gas and health, which need regional data. Novatel, a GPS company, is developing the navigation system for aviation, and exports forty-five percent of its products to U.S. The expected field in the future are telecommunication, infrastructure, defense, health protect business, emergency system and administration system.

The second cluster, information technology, has developed more than the average of North America for the last decade. However, it is not enough to develop comparing to the development of Silicon Valley and Seattle. The location coefficient is 2.5, so it can be said that there is an agglomeration of firms. The employees working in the field of software development and system design occupy 56 percent of all. Consulting business in the field of science and technology is the second, 23 percent. The share of processing of information and data is 12 percent, and professional design service has share of 9 percent. The rate of increase of the average income in information technology is more than that of all industry by 5 percent. A development can be expected in the future, and a variety of markets will

emerge without relation to the size of firm. Trade among firms of oil and gas industry in the international market as well as domestic market is expected, too. It is advantageous for the development of information technology that iCORE, ARC, TRILabs and CTI, which are research organizations and incubations based on Alberta or Calgary, have a potential to assist the research and development. However, there is a concern that brain drain has continued, and excellent technicians of information will cross the border.

Tourist, art and entertainment, which are the third cluster of future development, without doubt, have their centre in Calgary among the western cities. But, the recent growth in these fields is not so eminent. They include tourist travel, drama, orchestra, contemporary music, sport, historical architecture, amusement park, gamble, large-scale park, hotel and motel, and drinking and delivery service. Tourist income of Canada occupies 2.9 percent of the world total, and it is not small comparing to other countries. The rate of increase of tourist income is more than the international average. But, it does not mean that Calgary attracts so many tourists. The number of tourist coming to Calgary has stagnated recently due to the terrorism happened in U.S. It is hoped that a new concept, the centre of the new West, becomes widespread to break down such a situation. At present, Stampede, a traditional event held every year, and sport events based on the legacy of the Olympic Winter Games are main elements to attract tourists.

3 . Industrial promotion of transportation, communication and health

Transportation and warehouse had an important role from the start of the city. About half of this cluster (51 percent) is related with the transport of wholesaling goods. It consists of aviation transport (9 percent), railway (10 percent), truck (15 percent), wholesale and warehouse (7 percent) and related services (8 percent). Originally, this industry has developed from the transport of oil and gas, which are the basic resources for industry, and many firms have developed in the related field of oil and gas. Average income of employee has increased 25 percent for last eight years, but it is a little lower than the national average. Transportation centre and logistics centre have recently increased, and business style has been modernized. Main centres are Wal-Mart distribution centre, Canadian Tire distribution centre, Canadian Freightway and Consolidated Firstfreight.

Inter-modal transport by truck and aviation has been internationally promoted, and Calgary has been involved in such trend. While the share of truck has eroded that of railway, air cargo has developed with the internationalization of economy. The transportation between Calgary and Asia has a large share, and the rate of increase is more than the world average. The progress of information technology made it possible to response quickly to the consumer's demand. New technology such as satellite, trucking service and Internet has promoted more efficient business. There is a possibility to heighten the status of inland port as distribution centre in place of sea port, and the regional competition among Minneapolis, Salt Lake City, Winnipeg etc. will become keen. Under these circumstances, the improvement of highway, the solution of traffic jam, education of man power, and collaboration between business and administration are really necessary to strengthen the transportation and warehouse function of Calgary.

Calgary is known as one of the agglomerations of wireless telecommunication industry in North America. This industry contains Personal Area Networks (PANs) , Wireless Local Area Networks (W-LANs) and Fixed Wireless Access Systems (FWAS) . These businesses and the related business that supply parts employ 120 thousand workers in total. The location coefficient is 1.5, and this indicates that the agglomeration is smaller than that of Ottawa and Denver. Large agglomeration can be seen in the production of communication device. Nortel Networks, Cell-Loc, Wi-LAN, CSI Wireless are representative companies. Wireless network is still developing, and the third generation will make

it possible to communicate more easily and with wider scale. TRILabs is the company that is expected to contribute to the development of advanced technology. Security problem, standardization for competition and improvement of communication device are necessary to develop further this industry.

Welfare business is expected to develop highly in the future, and it is designated as one of industrial clusters. As this business is developing, it is not easy to define the correct scope and content. However, it is clear that it has interdisciplinary and demand oriented characteristics. Traditional health service, health promotion for future, biomedical treatment, health service and recreation are included in this business. Calgary is known as a healthy town and has an advantage that a variety of research facilities related with healthy lifestyle have developed. Remote medical service, bio-mechanic products, health improvement training and resort care have evolved. It is important to make use of these regional resources and bring up further as new industry. Further innovation and production of new item and service are necessary to realize this purpose.

IV Transportation infrastructure and commerce, service and service in downtown

1. Location of main roads and role of public transportation

Calgary has an area of 789.9 km², and its population is 956,078 at the year of 2005. Therefore, the population per square meters is 1,252.3. The shape of the city is a slightly long rectangle in north and south direction, and the Bow River running from northwest to southeast divides the city into two parts. The junction of the Bow River and its branch running from south into it is the origin of the city, and the present downtown is located there. Tsuu Tina Nation where native Indians live is in the southwest

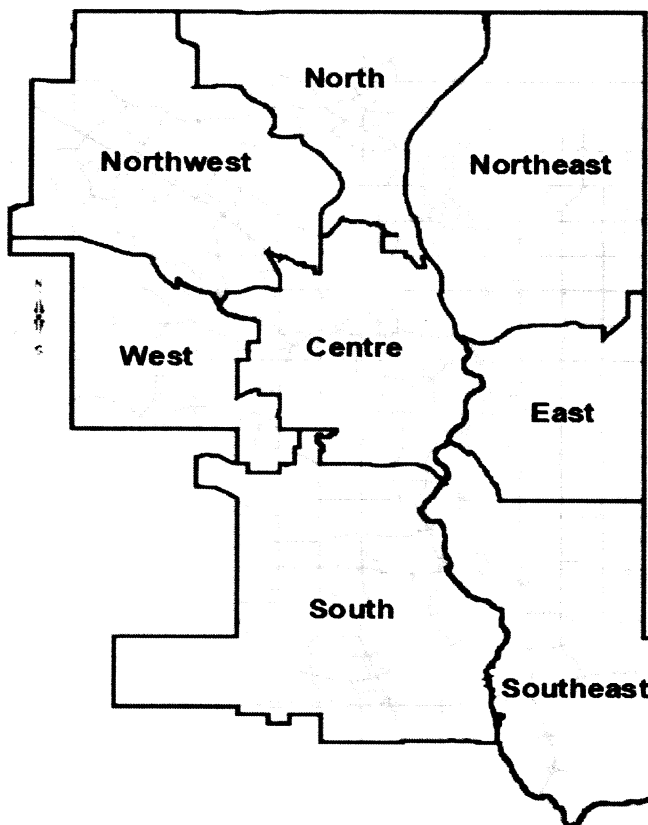


Figure 12. Area Classification of the City

of the city, and it looks as if it cut into the city from the west. Municipal District of Rocky View is in the north of the city, and Municipal District of Foothill is in the south of the city. These two districts are rural in nature, but the contacting areas with Calgary are influenced from the city. Therefore, the city sets Intermunicipal Development Plan Boundaries in order to promote mutual development. These boundaries look like a flame of a picture to surround the city of Calgary.

It is not limited to Calgary that road system has an important clue to understand the urban structure of a city. A lattice of the East-West and North-South shaped road system is adopted in Calgary where the topography is almost flat. Therefore, it is very easy to understand the urban structure. Basing on this road system, the urbanized area is divided into four districts: northwest, northeast, southeast

and southwestern districts. As the road running East-West is called avenue and the road running North-South is called street, the address of 550 8th Avenue SW, for example, is the 550th spot of the eighth street running in southwest district in east and west direction. It is decided that as for avenue, a number begins with the 100th, and a number begins with the several in the case of street. The origin of lattice-shaped system is fixed at the bridge on the Bow River, and the number of avenue or street become larger with the distance from the origin for each direction. All the address is not represented by the avenue and street system. A road name peculiar to the address is used in the peripheral area where a lattice-shaped road system is hard to suffer from because of the complicated topography.

Main roads add accent to the lattice-shaped system, and support fast and easy movement by car in the city. Of them,

Highway 1 is the most important and consist of a part of trans-Canadian Highway running through the country in East-West direction. 16th Avenue NE is equivalent to this in the city. Another important road in North-South direction is Highway 2, queen Elizabeth II, which connects Calgary and Edmonton. This highway comes from Montana in U.S. and goes up to the north via Edmonton. It runs along the Bow River in the southern part of Calgary, and goes through to the west of international airport. Local people call it Dearfoot trail. As it is straight line-shaped highly specified road, here are many cars running at speed. In addition, as main roads running lengthwise through the city, there are highway 22X and highway 8.

Automobile traffic is indispensable for people to move in the city of Calgary, and 42.8 percent of commuting was carried out by car in 2001. Although this percentage was slightly smaller than the national average, it could not be denied that people depend strongly on car traffic. There is much traffic volume per day in highway 2, namely the place of Dearfoot near the downtown. Average traffic flow per day amounts to 200,000 in 1998. Highway 8 and its bifurcation to the downtown have much traffic flow, too. It counts about 100,000 per day. Ring road surrounding the central area generally has much traffic flow. Calgary, which is a developing city with high speed, has a traffic problem that the preparation of road can't catch up with the increase of traffic flow. Therefore, a movement to review the construction of road appeared while expanding still road network. It is a movement that road traffic should be reviewed from the viewpoint of sustainability.

Train and bus are the transportation means that sustain citizen's movement beside car. Calgary Transit is the organization that manages these transportation means. The previous incarnation of Calgary Transit was Calgary Municipal Railway established in 1909, and it has provided transportation services such as streetcar and bus. In 1881, it laid LRT that was rare in North America, and expanded routes smoothly afterwards. At present, there are two routes: route 201 going from southern part to northwest via downtown and route 202 going from downtown to northeast. These two routes are

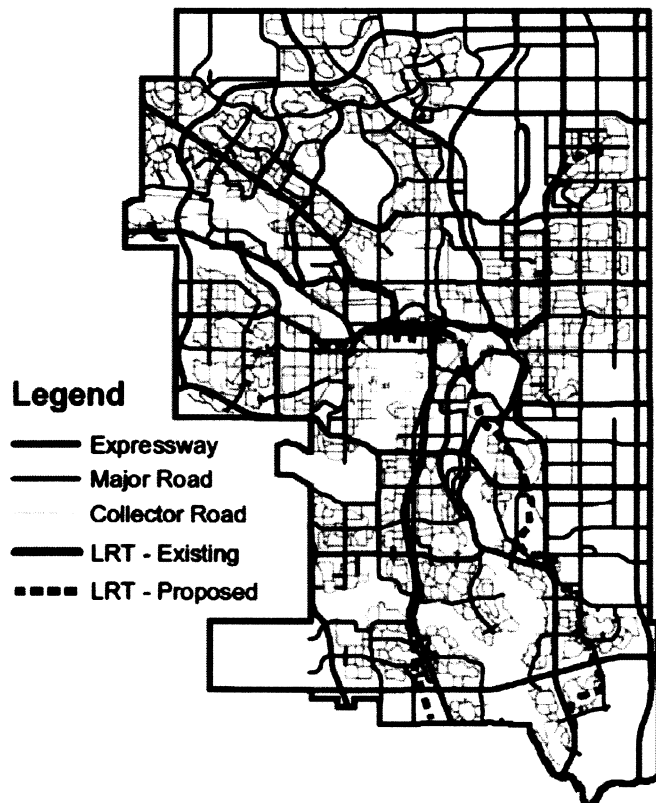


Figure 13. Transportation System

connected at the downtown, and have 36 stations in all. Citizens are much familiar with this transportation and call it C-Train. Including C-Train of which route is 42.1 km long, Calgary Transit has 4,500 km public transportation network in total. Total amount of passengers in 2004 was 117 millions, and income profit was 80.6 million Canadian dollars.

2. Range of downtown area and space of office, commerce and service

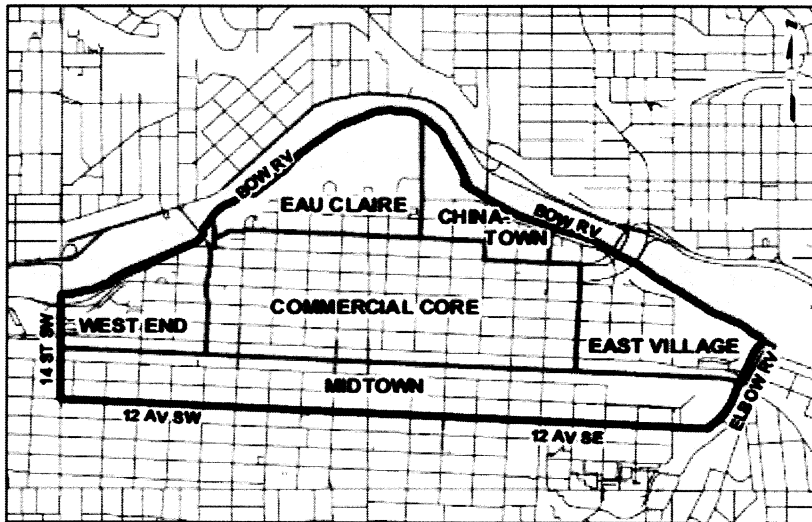


Figure 14. Areal Classification of the Downtown

Downtown of Calgary consists of three neighborhoods and three districts. This area is bordered by the Bow River for the north side and bordered by the Elbow River for the west side. East end is 14 Street SW and South end is 12 Avenue. The reason why neighborhood and district are distinguished is the difference of the degree of agglomeration density. The

former includes central commercial area, West End connecting with core area, and East Village that is east side of core area, and has more dense population. On the other hand, district consists Eau Claire, Chinatown and Midtown that is south to Chinatown. As Midtown is a little narrow district along CPR railway, it is called belt line.

The area of downtown is 984 acres, and 134 acres of these are unused. In addition, the land on which building is less than second floor and nearly unused amounts to 170 acres. There is particularly much unused land in belt line. Land as parking lot amounts to 160 acres. Total floor area for office, commerce and service is 6.5 million m². Of them, office floor occupies 66.7 percent of all. It is followed by retail (11.3 percent), parking (10.6 percent), hotel (4.7 percent) and restaurant (1.2 percent) in this order. In other word, office uses are dominant in the downtown, and a variety of buildings have been constructed for business activities here.

Several buildings standing in the downtown are high from the viewpoint of not only western Canada but also nationwide. The highest building, Petro-Canada Center that has 53 stories and was built in 194, is 215 m high. Bankerhall West and Bankerhall East, which have 52 stories and 197 meters height, follow it. In addition, Calgary Tower has more than 190 meters height, but it is not office building but a tower for sightseeing. Beside them, there are five buildings that have 160 meters height in a relatively small area. These high rise buildings are surrounded by lower buildings, and they make a business, commerce and service space as a whole.

The most convenient infrastructure for walking in the downtown is the corridor that connects buildings. This was originally constructed for separating walking space and road for car. Its availability can be seen in moderating pain to move the downtown in the cold time of winter. The corridor that connects buildings and is called sky walk is popular in North America. However, there is no city but Calgary that has long corridor and maintains in good condition. It is said that this corridor was planned to build based on an idea by H. Hanen, who worked at the department of urban planning in the city in the latter part of the 1960's. Construction started since the 1970's. Total length of the



Figure 15. Landscape of the Downtown Calgary

corridors connecting 57 buildings in the downtown amounts to 16 km at present. As the corridor is set at the height of 15 feet from the ground, it is called +15. Hanen awarded Vincent Massy's prize for this work. New building with +15 can gain additional floor space within it. The reason why +15 has developed so much is in such a advantageous system.

Retail has the second large space following office. Total area of retail amounts to 96,319 m², and the number of retail stores accounts 3,755.

Retail in the downtown

occupies 14.2 percent of the city total by area, and 15.2 percent by the number of stores. Stephan Avenue Walk is the central space for retail and service of the downtown. Retail stores, restaurant, movie theaters and drinking places are facing with the avenue. A closed mall consisting three shopping centres is located adjacent to this avenue. Beside this mall, Eaton Center, TD Square and Scotia Center consist the retail and service space of the downtown.

Entertainment, culture, arts and science facilities contribute to the increase of amenity as well as shopping centres and malls in the downtown. According to the data of 2002, the number of tourists



Figure 16. Stephan Avenue Walk

that visited the amenity facility of the downtown amounted to 1.3 millions. The number of participants in a variety of events such as theater in the downtown was 688 thousands. Glenbow museum that has collected historical materials of the western Canada attracted 58 thousand visitors and Calgary science centre attracted 225 thousand visitors. While the downtown seems to be occupied by business space, it is filled with consumers looking for shopping goods or tourists visiting amenity facilities.

3. Characteristics of population and housing in downtown

A lot of urban functions are agglomerated within the downtown of Calgary, but there is less residential population in it. Three neighborhoods have population of 10 thousands in total, and

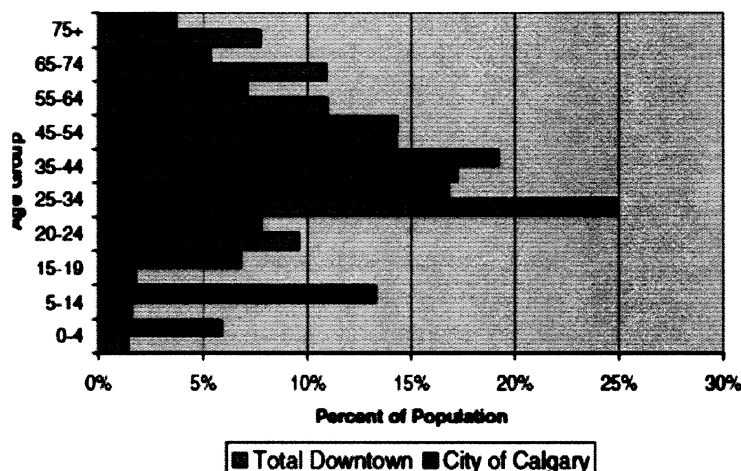


Figure 17. Age Distribution of Population

The population of the downtown occupies only 1.6 percent of the total city. The share has continued to decrease since the end of the 1960's, and the weight of downtown population still remains less. The reason why the share has successively declined is that population has increased outside the downtown. The absolute number of downtown population temporally decreased in the former part of the 1980's, but it has continuously increased for last three decades. How is the future? According to the estimation of 2004, it is expected that population will increase up to 25000 by 2033. Comparing to the city as a whole, age structure of population in the downtown has a unique characteristics. The share of population between 25 years old and 35 years old is larger and the share of population under 19 years old is smaller. These characteristics are represented in the lesser population per family. It is only 1.7 in the downtown comparing to that of the city total, 2.6. The share of younger employees and small family consisting old singles or couples is higher than that of city as a whole.

At the year of 2001, the number of workers in the downtown was 124 thousands. As the total workers in the city accounted 488 thousands, the share of the downtown was 25.4 percent, a quarter of the city. According to the present forecast, this share will decrease in the future, because working opportunity outside the downtown will increase more. Primary sector occupies 32 percent of workers in the downtown. The reason is that oil and gas industry belong to this sector, and most of professional workers, which is corresponding to 15 percent of downtown workers, are charged in the business related with energy. However, the share of service outnumbers this, and it occupies 40 percent. Retail's share is 11 percent, and wholesale and manufacturing has 1 percent, respectively. Comparing to the composition of the city total, it is clear that the share of primary industry and professional occupation are prevail. Employees working at the energy related companies are predominant in the downtown.

As mentioned before, residential population of the downtown occupies 1.6 percent of the city total, and housing of the downtown occupies about 2 percent of the city total. While these shares are still less, it is expected that the absolute number of housing will increase in accordance with the growth of population. Most of housing, 98 percent, belongs to the apartment type, and detached house is limited. It became popular that the rate of buying of condominium is larger than that of leasing. While it is well known that housing price is high in Calgary where population has increased, housing price increased by 9 percent from 1997 to 2004 in the downtown. The central core, commercial area, has housing of 5000, and West End has about 1000. Other three districts have 900, respectively.

midtown has more population, 20 thousands. Eau Clair's population is 1,500 and Chinatown's is 1,200. Comparing to the eastern cities in Canada, it is clear that the population density of Calgary is lower than these cities, and this represents that Calgary goes back a short way and has a wide suburban area. At present, condominiums and apartments are being constructed within the downtown, and the increase of population density is expected in the near future.

V Location of main commercial and service facilities and industrial regions

1. Location and characteristics of shopping centres

Contrary to the retail and service activities that provide higher goods and services, retail and service outside the downtown supply a little lower goods and services. That is to say, there is a hierarchical difference between them, and shopping area and trade area are different, respectively. The former has a wider trade area spreading all over the city.

On the contrary, the latter limits its trade area a little. However, it is not deniable that as commercial system is always changing, the emergence of business changes the relatively simple hierarchical system. New type of business such as outlet mall, box store and power centre demands the previous commercial order to change. Commercial change that occurs in nationwide scale can be observed in Calgary, too.

If the total number of shopping centres and shopping malls are divided by district, central core is allocated 9. Central, 2; Macleod, 4; Northwest, 7; Northeast, 7; Southeast, 5; Southwest, 5. It is popular that shopping centres are developed and managed by private developers in Canada. Cadillac Fairview, a large developer, for example, has two shopping centres in Calgary. One of them, Chinook Centre, has a department store (the Bay), and two supers (Zellers and Sears) as the key tenants. It is located at the crossing point of Macleod Trail and Glenmore Trail SE in the southern part of the city. There is 200 stores including the key tenants within the shopping centre. Paramount theatre, bowling centre, large-scale food court are attached to the shopping centre that is categorized into a super regional type. This is a shopping centre that is appropriate for the city continuing to develop.

Cadillac Fairview has another shopping centre in the city. It is located just west to the University of Calgary and close to the the Bow River. As the area is 895 thousands, it belongs to a super regional type. It was renewed with the investment of 90 million Canadian dollars and reopened in August 2004. It has large-scale underground parking, and is blessed with the accessibility to public transportation, because the station of C-Train is located near by. Key tenants are a department store (the Bay), two supers (Safeway and Zellers), and Toy R Us, and total number of stores amounts to 140 including these key tenants.

2. Location and role of main service facilities

Enrichment of quality and amount of public service is needed in a large city of which population amounts to one million. Here, we will refer to medical, educational, cultural, sport and recreational services that are regarded as public services, and discuss heir locational patterns and characteristics. First of all, hospitals and clinics are referred to. There are four main hospitals: Rockyview General Hospital, Peter Lougheed Centre, Foothills Medical Centre and Alberta Children's Hospital. Of them, only Peter Lougheed Centre is located east side of the city. These are designated as core centres among 12 hospitals within the medial service area covering the southern part of Alberta.

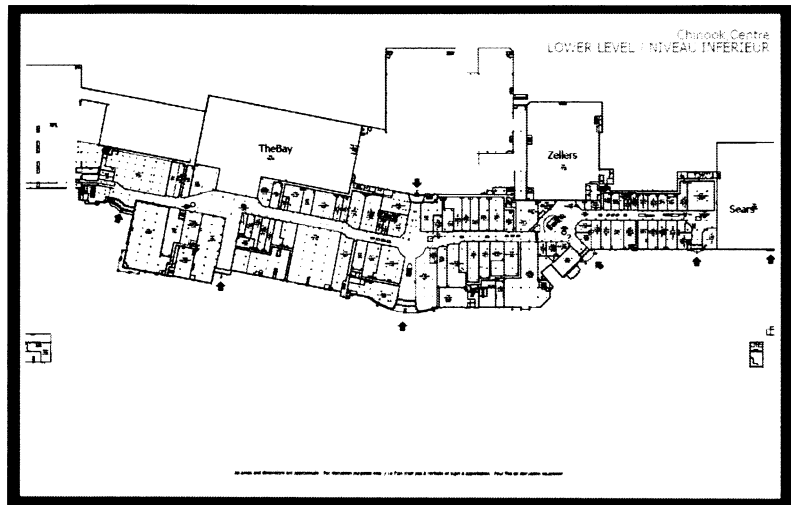


Figure 18. Layout of Chinook Shopping Centre

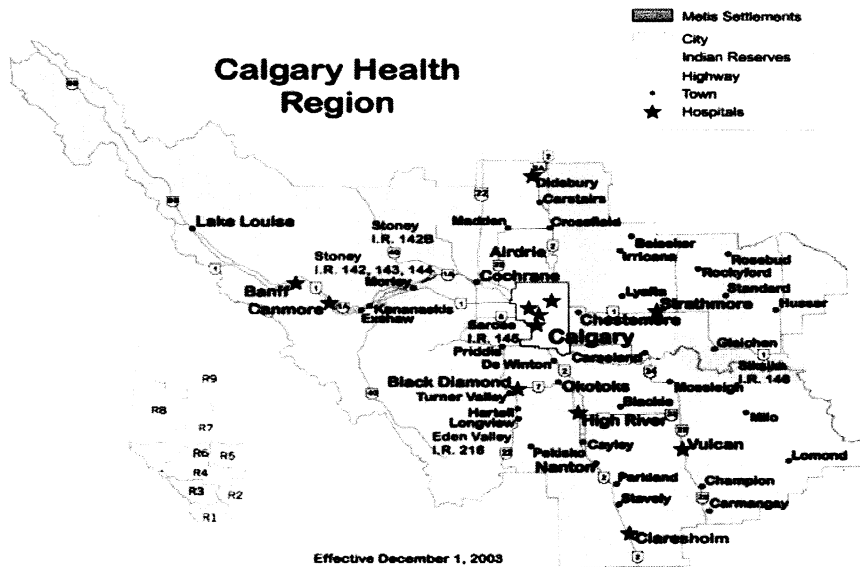


Figure 19. Location of Main Medical Facilities

Rockyview General Hospital is close to Glenmore reservoir, and has 500 beds and 2,000 staffs to supply medical service. Central medical facilities are furnished, and emergent medical system is completed for 24 hours a day. Peter Lougheed Centre located at the crossing site of 26 Ave. and 36 St. in the northeast of the city has a similar size to that of Rockyview General Hospital, and is furnished with 506 beds and 2000 staffs. It has concentrated medical facilities and 24 hours

corresponding system, too. Foothills Medical Centre located at 29 St. N.W. has large-scale medical facilities with 700 beds and 6000 staffs. It also has 24 concentrated medical beds, and a lot of medical care are provided. Alberta Children's Hospital is close to the downtown, and takes care of 59 thousand patients every year. Patients aging from 0 to 18 visit this hospital even from the southeast of BC and the southwest of Saskatchewan.

There are 14 health clinics in the city, and they provide usual medical services. Spatial distribution is as follow: southeast, 6; northeast, 4; southwest, 3 and northeast, 1. The share by the southern part of the city is a little large. Half of them are in the downtown and inner city, and suburbs have less.



Figure 20. Foothills Medical Centre

As high educational institution, the University of Calgary and Southern Alberta Institute of Technology are in Calgary, and Royal Mount College and Bow Valley College supply educational services, too. The University of Calgary is located northwest 5 km from the downtown, and has a campus of 213 hectares. Total number of students amounts to 50 thousands. Of them, 30 thousands are students of normal programs, and 20 thousands are students of life-education courses. Educational services are provided by 1,900 teaching staffs and 2,400 administrative staffs. This university started when it was separated form the University of Alberta in 1966, and has 16 schools and more than 60 departments at present. Study on the North Pole, which represents the locality of this university, and other studies such as law, energy, environment, petroleum and transportation are mainly performed in this university.

Southern Alberta Institute of Technology: SAIT started from Provincial Alberta Institute of Technology: PAIT that was established in 1916. This university moved from the downtown to the heritage centre well known as a historical building in 1921, and was transferred further to the present place after WWII. The university was called by the present name since 1965, and has educated a lot of engineers and professionals afterward. It provides a variety of educational programs giving more than 70 degrees for 650 thousand students. As the central institute of technology in this area, practical and

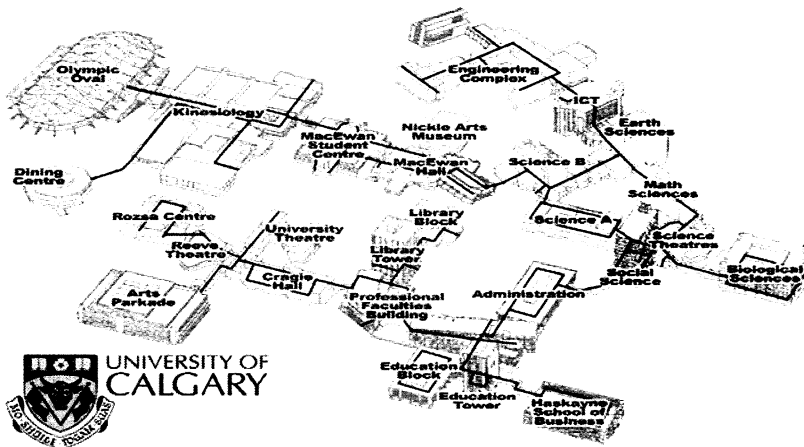


Figure 21. Campus of the University of Calgary

applicable genres such as mechanic technology, health science, business, and commerce are the representative study fields.

Royal Mount College was established in the downtown in 1910 as a Methodist educational facility. It has a main campus in Lincoln Park and three other campuses in the city. Business school, communication study, health and community study are its main departments. Total number of students amounts to 13

thousands: full time students 8.6 thousands and part time students 4.1 thousands. Bow Valley College was established in 1965 and has a main campus near the city hall, downtown east. This campus and another campus (Rocky Mountains Plaza Campus) accept 4 thousand students every year. English as academic basic and the second language, health, community care, business and industry are main courses.

As mentioned above, medical, educational, sport, and recreational services are furnished in Calgary, and they are provided by well-developed facilities and staffs that are ranked as high level in the country. This reflects the fact that there is no fiscal problem in Calgary and Alberta. It can be seen that people are not satisfied with the present situation and try to challenge seeing the next period. Such an aggressive attitude may be related with the regional climate that has grown up with open and independent atmosphere.

3. Location and development potential of industrial regions

Heavy industry, manufacturing, storage and light industry are located in the industrial regions of Calgary. In addition to ordinal industries, commercial and service industries such as car dealers, suburban offices and hotels locate their establishments in these areas. The reason is that even in the industrial regions, location is not limited to the industry in a narrow meaning. Rather, commercial and service firms are inclined to agglomerate because of the lower price of land and good accessibility. Main industrial regions of Calgary are in north/northeast, centre and southeast of the city, and the research park adjacent to the University of Calgary supplements them.

Central industrial region has an area of 5.5 square miles, and has a long history. However, old

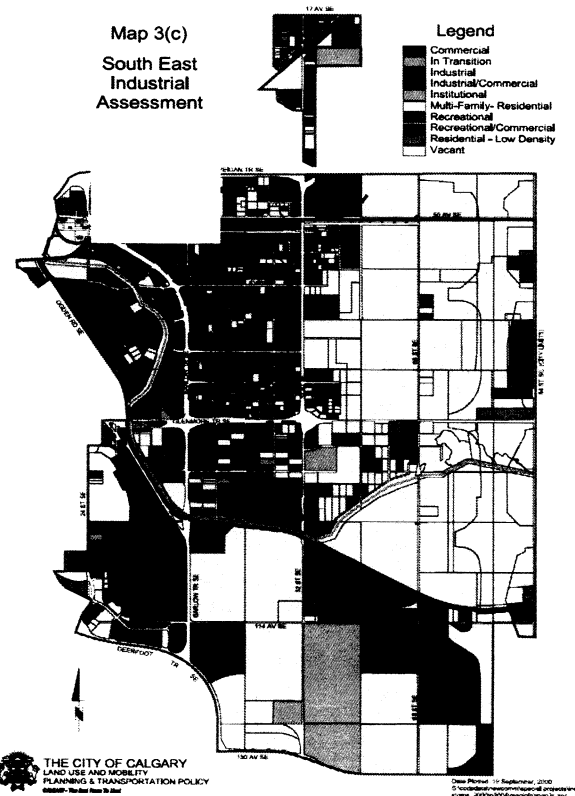


Figure 22. South East Industrial Region

heavy industries stopped their operations several years ago, and there is no industry to supplement the empty lots. Beside Ramsay, old industrial area still remains vacant. Because of the problem that heavy industries have polluted this area, there is less possibility that new industry is located in such a vacant area. This area has a good accessibility to the railway. As LRT runs within this area from north to south, it is blessed with public transit. On the contrary, transportation by automobile is not convenient. Land transfer to commercial use has advanced along main roads such as MacLeod Trail, Dearfoot Trail and Blackfoot Trail. As vacant lots are not large, office and commercial facilities rather than wholesale and distribution have a potential to use. Only one lot that is southeast of Dearfoot Trail and was used before by Cominco, a mining company, has a potential to develop in a large-scale.

Southeast industrial region has a large area of 17 square miles, and is blessed with the transit of cargo to the railway. It also has an advantage that the road connection to Dearfoot Trail, Barlow Trail and Highway 1 is convenient, and the connection to East Freeway will be completed

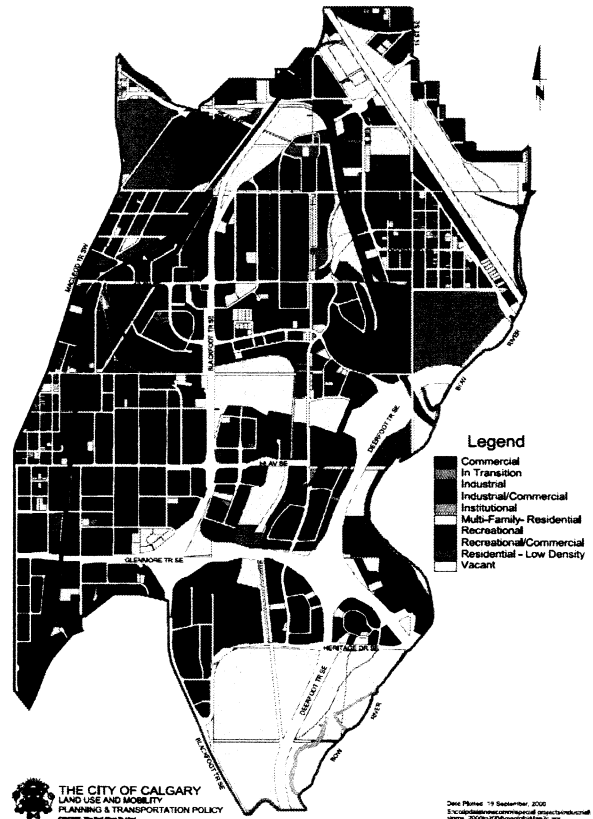


Figure 23. Central Industrial Region

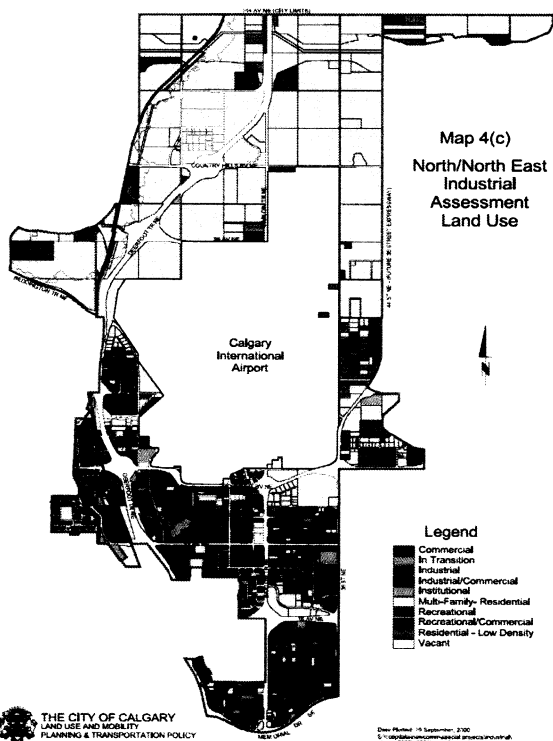


Figure 24. North/North East Industrial Region

in the future. The City of Calgary concluded an agreement with CN and CP to launch a joint development in 1961. Basing on this agreement, negotiation restarted in 1981 and 1991, and they had a conclusion that collaborative development should be strengthened. The City of Calgary has a lot of land in this southeast industrial region, and most of them are for heavy industry. There are many producer services, but they are all small-scale firms. Less suburban offices is located in this region, and main development can be seen along Dearfoot Trail and axes from west to east and south to north. The capacity shortage not enough to deal with flood is a task to solve, and the project for this is undertaking. In addition, there is another problem that industrial land receiving plenty of service is deficient.

Calgary International Airport is the core of north/northeast industrial region. Because of the problem of aircraft noise, northern area of the airport still remains undeveloped. There is less heavy industry, and industries blessed with services are agglomerated east side of this region. Buildings

adjacent to the airport south side and west side contain small-scale firms and offices. Of them, Nortel, Hughes Aircraft and Nova Tel are high profit enterprises. This area has an advantage for transportation by air. Administration office of the airport owns a land of 1,800 acres, but the basic use of this area is for leasing. It is expected that about 30 percent of new use of industrial land in the city will occur in this industrial region. Industrial activities in this region contribute most to the economy of Calgary at present. While his region maintains an advantage in the short run, but there is a possibility that traffic problem will happen in the future.

The fourth industrial region is the research park adjacent to the University of Calgary. This section is controlled by Calgary Technology Inc., and facilities and environment are fully furnished. This area is all used, and there is no vacancy.

In addition to the industrial regions mentioned above, there are regions designated for industrial land use in the northwest end and south end of the city, but they are not developed at all.

VI Residential area and social dimension

1. Regional structure of residence and its change

The population of Calgary was 933,495 in April 2004, and population increase from 2003 to 2004 was 11,180. As the average increase of population per year from 1993 to 2003 was 19,300, the rate of increase has declined a little. Net increase of population through social movement changed from 8,965 in 2003 to 2,253 in 2004. The reason is that the population inflow from British Columbia decreased because the economy of the state was recovered. The number of houses that accommodate more than 930 thousand people is 383,701 in 2004, and it increased by 34.5 percent from 1993 to 2004. However, all the houses were not occupied, and the rate of vacancy was 4.3 percent, 3.0 percent upper than that of previous year. The rate of vacancy was lower than 4 percent for the recent decay. Such a high rate was the result that the amount of housing supply outnumbered the number of moving in.

While about 380 thousands houses are distributed all over the city, there is a spatial difference in the distribution of house density. The house density generally decreases in accordance with the distance from the downtown. As to the house type, apartment and condominium are dominant in the central area and detached houses are popular in the suburb. Detached houses occupy 61.3 percent of all, and people living in houses of this type occupy 70.9 percent of the city population. Collective houses that have more than 5 stories occupy 6.7 percent of all

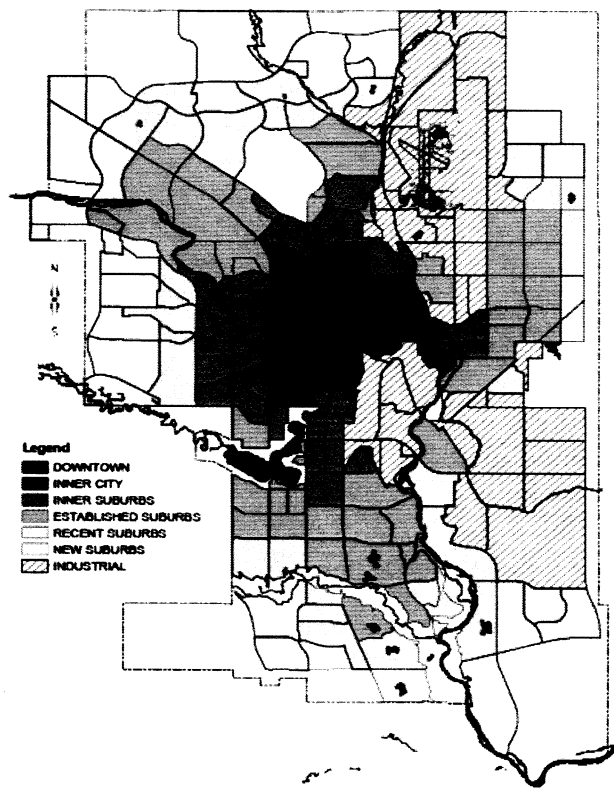
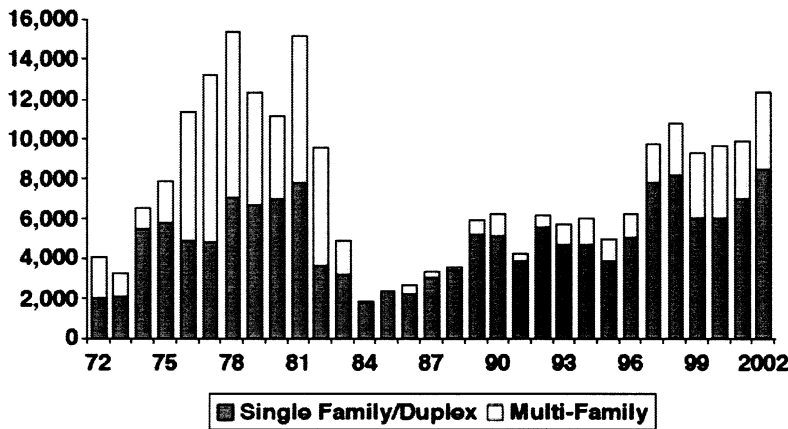


Figure 25. Residential Structure



Source: Canada Mortgage and Housing Corporation

Figure 26. Housing Start (1972~2002)

the houses, and they accommodate 3.9 percent of all the population. Other type of house occupies 31.4 percent in term of house, and 24.8 percent in term of population. Most of the house that has lower than 4 stories belongs to this type. Mobile houses accommodate 0.6 percent of house and 0.5 percent of population.

The fact that 70 percent of the citizens live in detached houses represents how the housing situation is

advantageous in Calgary. Such a situation is verified by comparing with other cities. For example, in Vancouver where there is less flat area, people living in detached houses occupy 53.6 percent of all. As Vancouver' population is twice as much as Calgary, the demand for housing is larger. However, the topographical condition seems to be related with the difference. There is a difference between Vancouver where mountains and hills exist near the seacoast and Calgary with a wide plain stretching from the east foot of the Rocky Mountains. These two metropolises are well known as expensive cities for their house prices, but the reason is not same. The reason of high price of house is that while Vancouver is not blessed with suitable land for housing, Calgary can't catch up with a rapid increase of population.

The urbanized area of Calgary can be divided into three parts: downtown, inner city and suburb. Of them, the area of downtown is the smallest and the area of suburb is the largest. The downtown is surrounded by the Bow River and belt line, and the inner city surrounds the downtown. The north end of the inner city is limited by 20 Avenue, and the south end corresponds to the southern industrial region and Mont Royal. The west end is bordered by Crown Child Trail, and the east end is demarcated by 19 Street. The suburb can be divided further by the period of development. The inner suburb that was developed in the early time extends widely westward and northward, and a little limited in both the south and the east direction. The reason is that there is Glenmore reservoir in the southwest, and large-scale industrial land extends in the east. The inner city is surrounded by the established suburb, which extends widely in both the northwest and the south. In the east, the established suburb hurdles the industrial region. Beyond this zone, recent suburb is developed, and new suburb extends further. The former corresponds to the north of Nosehill Park and the south of Fish Creek, and the latter extends along the border of the city.

2. House building in new suburbs

Like other cities, the population of residential area in Calgary has shifted with a periodical change. In the suburb, for example, population continued to increase for the first 10 or 12 years, and the housing area extended outward. But after a while, population increase became stable, and population began to

decrease because children grew up and departed from their homes. However after that, new generation came into again, and housing area started to regenerate. This periodical change moved from one place to the other, and the formation and change of residential area were repeated. The rate of population increase is the highest at the peripheral area of the city. On the contrary, population decreased at the inner area of this spot. As the total population has generally increased, the residential area has extended outward.

It is new suburb that the population of residential area increases most rapidly. The rate of population increase was more than 10 percent from 1998 to 2003 in this area. This area occupied 92 percent of the collective houses built in the same period, and also occupied 43 percent of the detached houses. 44 percent of this area extends in the north from the downtown and 27 percent in the south, which indicates that house development is more active in the north. The share of west is 15 percent, and that of east is 15 percent. While house development is expected to continue in the future, the duration of development varies among the areas. The duration is the longest, 15 years, in north, west and southeast, and northeast from 6 to 9, south from 7 to 11, and northwest from 5 to 7. There is less space for house development in the east. However, as the duration may be influenced by economic change and population trend, the situation will be fluctuated. The City of Calgary expects that 9,400 houses will be built every year from 2003 to 2007. New suburb will absorb 75 percent of these new houses.

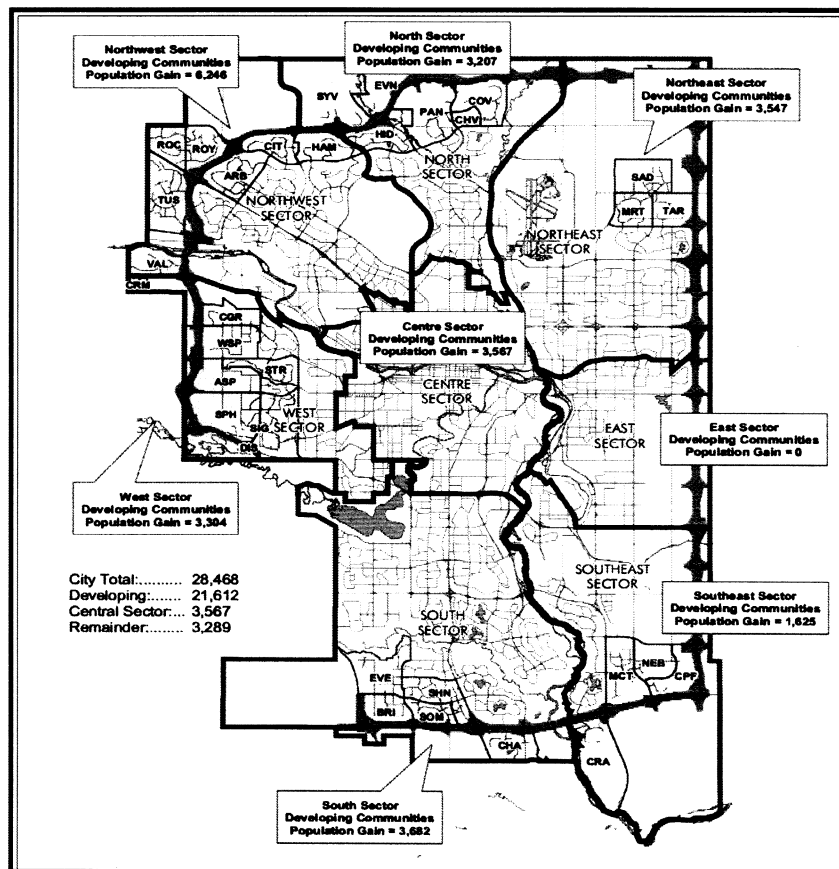


Figure 27. Growth in Developing Communities

When we refer to the residential area of suburb in Calgary, we have to touch upon the policy to raise the housing density. This is the policy to heighten the housing density so as to restraint the inefficient and wasteful development of housing in the suburb. The suburb with low housing density needs more spending for the social and community infrastructure such as water, road, electricity, gas, police, hospital and school. According to the estimation by the City of Calgary, to construct houses for 250 thousand people for the next 20 years, residential development with the density of 17.0 persons per hectare can save 14 km² comparing to the development with the density of 13.5. The saved space is large considering the present area of the city.

The average density of housing increased from 13.5 to 17.0 for the recent decay in Calgary. Therefore, it seems that the policy has already had an effect. The change of residence type from

detached house to collective house contributed to the effect. In 1993, detached house occupied 86 percent of all, but in 2003, it occupied 62 percent. During the same period, the share of collective house increased from 10 percent to 33 percent. More variety of housing types was needed in accordance with the change of residential structure and economic situation. The city area of 789.9 km² seems to be large, but there is less potential to extend the residential area considering the recent trend of population increase. The City of Calgary thinks it necessary to heighten the residential density even in the suburb considering the sustainability, and advances the formation of more compact residential area.

3. Social structure of residential area

As mentioned before, it is the most peripheral area that population increases recently with high speed. There are 51 census districts where the rate of population increase was more than 10 percent from 1996 to 2001, and most of them were in the peripheral area of suburb. In contrast, 76 districts that decreased population in the same period were in the established suburb. As population increased in

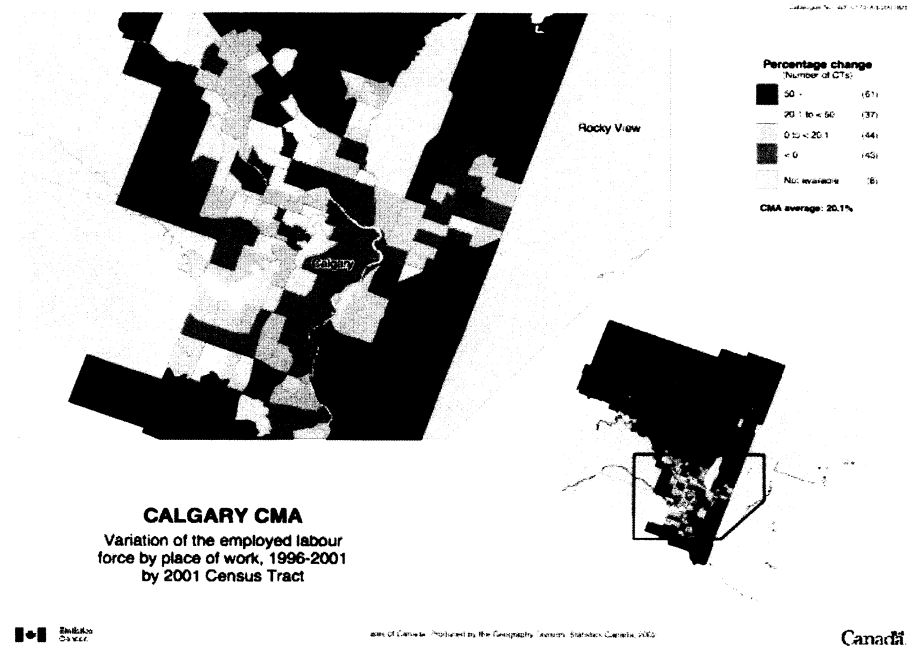


Figure 28. Population Change by Place of Work (1996~2001)

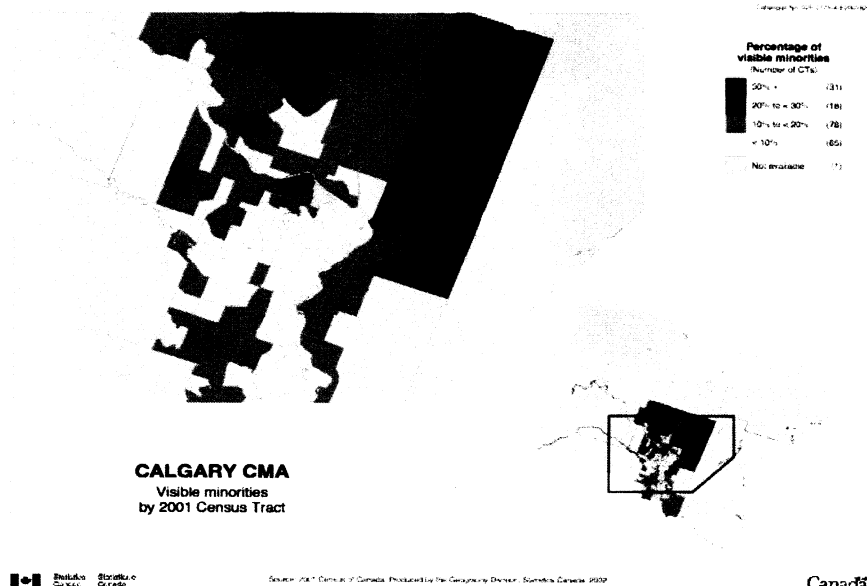


Figure 29. Visible Minorities by 2001 Census Tract

the inner city and inner suburb, it seems that a doughnut losing population appeared between two zones. The regional change of working population was different from that of residential population. The districts losing working population stretched from the north of the downtown to the south along the Bow River. Working population decreased in the east of northwest industrial region and the south end

of the city, too. There seems no general characteristic that the spatial pattern of the decrease of residential population showed.

Social characteristic of population is firmly related with the ethnicity of each residential district. Ethnicity influences the factors such as society, economy and culture, and they are important elements to understand the spatial structure of Calgary. According to the census data in 2001, people from overseas amounted to 1,974,410, and they occupied about 20 percent of all the population. Of them, Asian people, 850 thousands, was the largest ethnic group, followed by European, 720 thousands, African, 120 thousands and American, 10 thousands. Asian, the most dominant people, consists of East Asian (31 thousands), Southeast Asian (280 thousands) and South Asian (180 thousands). English (250 thousand) is the dominant among European people, and West and North European (170 thousands) and East European (170 thousands) follow it.

In Canada that was colonized mainly by Europeans, people judged as non-European from the appearance is regarded as minority. People included in this category amounts to 164,900, which correspond to 17.5 percent of all the population. They consist of Chinese (31.4 percent), South Asia (22.3 percent), Filipino (9.9 percent), African (8.3 percent), Southeast Asia (7.6 percent), etc. The distribution of these minority is not spatially even, and most of them live in the residential area on the east side of the International Airport and in the residential area on the north side of Nosehill Park. The rate of minority is more than 30 percent in the former area, and more than 20 percent in the latter area. The spatial pattern that most of visible people live in the north and northeast of the city is similar to the spatial pattern of immigrant. From this, it is apparent that Asian immigrants increased recently tend to live in the northeast and north of the suburban residential area.

Concluding remark

The author discussed the development process of regional economy and the spatial pattern of urban structure in Calgary. The basic characteristics of this city, which have changed historically, are as follow: pioneer settlement, transportation gateway city, agricultural industrial city, and development centre of oil and gas. The change of characteristic has not finished yet, and new development factors such as tourist, entertainment and telecommunication are being added. A city, of which industrial structure is very simple, is difficult to survive, and of course, can't develop further. In the case of Calgary, it succeeded in making use of a ratchet effect protecting the city from the economic decline, and has developed through the diversification of the industrial structure. A variety of people coming from the other areas of the country and overseas areas made a continuous development possible. Aggressive climate of the economy contributed to the development based on the viewpoint of international scale and long range. In addition to the traditional event, the Olympic Winter Games was effective factor for the international development of Calgary.

In Canada, cities spread widely in the nation, but there is less cities in the western region of the country. Without resources such as oil and gas, Calgary could not develop as we see today. This city has no collaborate cities in the neighborhood, and tried alone to change itself from a simple city based on resources to metropolis with many kind of urban functions. It is a kind of contemporary miracle that many people come every year into an isolated city on the plain from many directions of the country and overseas. The history that a lot of people tried to make use of resources and challenged a harsh environment is the history of Calgary. The development of this city, of which population is expected to excel one million in the near future, deserve continued attention.

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