

**Transit Oriented Development From Both Sides of the Tracks: How the City  
is Promoting It and How Developers are Building It**

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## **Transit Oriented Development From Both Sides of the Tracks: How the City is Promoting It and How Developers are Building It**

The City of Calgary has experienced substantial population growth over the past eight years with an annual average growth rate of 2.4%, pushing the total population over one million. This increase in population has put more demand on public infrastructure, specifically roads and transit.

In an effort to meet the mobility demands of Calgarians, and in turn reduce the dependency on vehicles, the City of Calgary is taking steps to improve the existing transit system. These improvements include extending current Light Rail Transit (LRT) lines, expanding the use of Bus Rapid Transit (BRT), increasing existing train capacity from three cars to four and promoting development and transit use through Transit Oriented Development (TOD) planning and policies.

This paper will look at how the City is working with developers to enhance transit station areas and what some developers are proposing given these opportunities. Three specific stages of the TOD process will be covered and include the following: the land use planning stage with the City; the TOD specific transportation impact assessment requirements using the City's new Mobility Assessment & Plan (MAP); and the successful proposal of TOD areas by developers.

# 1. Introduction

The City of Calgary has experienced substantial population growth over the past eight years with an annual average growth rate of 2.4%, pushing the total population over one million. This increase in population has put more demand on public infrastructure, specifically roads and transit.

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This paper will look at how the City is working with developers to enhance transit station areas and what some developers are proposing given these opportunities. Three specific stages of the TOD process will be covered and include the following: the land use planning stage with the City; the TOD specific transportation impact assessment requirements using the City's new Mobility Assessment & Plan (MAP); and the successful proposal of TOD areas by developers.

## 2. Transit Oriented Development (TOD)

### 2.1. Purpose of TOD

The goals of TOD areas are to create a mixed use walkable community which in turn:

- encourages an increase in transit ridership
- decreases the reliance on vehicles
- creates a friendly pedestrian and cyclist community
- provides complimentary land uses to promote community interaction, and
- increases the amount of public space by reducing parking supply.

Successful Implementation of TOD is important as it allows transit to reduce the need for motorized vehicles, which positively impacts the environment. Successful TOD areas can also have secondary impacts by improving personal health, reduce car ownership, extend the life of infrastructure, reduce urban sprawl and provide more funding for transit.

### 2.2. What Makes TOD Work

Typically, successful TOD areas are located in larger centres where mass transit systems are available, and active mode choice is well supported, and as a result there is less dependency on personal vehicles. These areas have a good mix of land uses and provide safe, efficient facilities for all modes of transportation (pedestrians, cyclists, transit and vehicles). A proper mix of land use and densities also ensure that the area is used at all times, for people travelling to/from work, going to restaurants in the evenings and during the day, retail that will attract people during the week and on weekends and so on.

If the development is made up of primarily one land use there is greater chance for reliance of vehicles, since the area will be "incomplete" and will rely on the rest of the city for the needs of users – users are

forced to travel. This can be seen in downtown Calgary where the stations are primarily used during the weekday for commuters into work. Conversely, if the transit and pedestrian facilities exist but there is only low-density development, then the transit and pedestrian facilities will be underused.

Thus it is also important to consider the type of land use. High density residential is more appropriate for TOD than low density residential along with specialty retail over big box retail. High density development puts more people closer to transit; the closer people live to a useful, well-functioning transit system with many destinations, the more likely they will use it. Low density development and big box stores encourage people to rely more on their vehicles than on other modes of transportation.

Examples of where a proper balance of land use and density, and viable transit create a vibrant TOD area can be seen in Toronto along the subway line. The Bloor Subway Station located in downtown Toronto at the intersection of Bloor Street and Spadina Road has a daily ridership of approximately 191,800 passengers to and from the trains<sup>1</sup>. This station provides no parking, there is a diverse mix of land use (Figure I) consisting of high and medium density residential, commercial, specialty retail, institutional and restaurants.

One of the most critical factors of achieving a successful TOD area is not only the provision of transit, but effective well planned transit which will then see high ridership. TOD is not effective if the transit facilities go unused by the residents and the surrounding area.

### **3. Transit Use in Calgary**

#### **3.1. Statistics**

Transit ridership in Calgary has consistently been on the rise with approximately 95.3 million passengers annually in 2008 as illustrated in Figure II. There are approximately 1,102 buses and light rail vehicles providing service on more than 160 routes.

With such high transit ridership improvements are being implement to the existing system such as:

- Increasing train capacity from three cars to four
- Plans to extend existing LRT lines and plan for future LRT lines
- Purchasing more buses and LRT cars

#### **3.2. Existing Transit Areas in Calgary**

##### **3.2.1. Existing Transit Stations**

TOD areas are typically located along Light Rail Transit (LRT) stations or major transit hubs, but as of 2009, very little true TOD development has been constructed in Calgary – the majority of development along the LRT is low-density. The LRT line in Calgary has 25 LRT stations outside of the downtown core. As ridership and service increases the City has recognized that planning for TOD areas along the LRT line is required.

To get a better understanding of how the existing LRT stations in Calgary are functioning, the land uses, surrounding community populations, and parking and ridership statistics were reviewed and summarized in Table I. Only stations outside of the downtown core were summarized.

**Table I: Existing LRT Station Statistics**

Station	Surrounding Communities	Population <sup>2</sup>	Land Use <sup>2</sup>	Parking <sup>3</sup>	LRT Ridership <sub>3</sub> (per day)
<b>South Line</b>					
Sommerset / Bridlewood	Sommerset Shawnessy Total	8,444 9,403 17,847	Commercial Neighbourhood Commercial Regional Community Service Low Density Residential Multi-Residential Special Purpose	913	13,000
Shawnessy	Shawnessy Total	9,403 9,403	Commercial Community Commercial Regional Low Density Residential Special Purpose	206	7,300
Fish Creek Lacombe	Shawnee Slopes Millrise Midnapore Total	1,539 6,383 7,143 15,065	Commercial Corridor Community Institution Low Density Residential Multi-Residential Recreation Special Purpose	1130	7,600
Canyon Meadows	Canyon Meadows Lake Bonavista Total	7,957 10,534 18,493	Commercial Community Commercial Corridor Low Density Residential	260	7,500
Anderson	Southwood Willow Park Total	6,146 5,365 11,511	City and Regional Infrastructure Commercial Community Commercial Office Commercial Regional Low Density Residential Multi-Residential Recreation School, Park, Community Reserve	1750	14,400
Southland	Haysboro Acadia Southwood Willow Park Total	6,035 10,697 6,146 5,365 28,243	Commercial Office Low Density Residential Multi-Residential Recreation Special Purpose	650	7,800
Heritage	Haysboro Acadia Total	6,035 10,697 16,732	City and Regional Infrastructure Commercial Corridor Industrial Low Density Residential Multi-Residential School, Park, Community Reserve	557	11,500
Chinook	Meadowlark Park Manchester Kingsland Total	598 614 4,373 5,585	Commercial Community Commercial Corridor Commercial Office Commercial Regional Industrial Commercial Industrial General Special Purpose	557	15,600

**Table I Continued**

<b>Station</b>	<b>Surrounding Communities</b>	<b>Population<sup>2</sup></b>	<b>Land Use<sup>2</sup></b>	<b>Parking<sup>3</sup></b>	<b>LRT Ridership<sub>3</sub> (per day)</b>
39th	Parkhill / Stanley Park Manchester Total	1,559 614 1,559	Commercial Corridor Commercial Corridor Community Service Industrial General Industrial Redevelopment Low Density Residential Multi-Residential	229	6,700
Erlton	Erlton Mission Roxboro Total	1,191 4,159 428 5,778	Centre City Mixed Use District City and Regional Infrastructure Community Service High Density Residential Low Density Residential Multi-Residential Recreation Urban Nature	0	1,600
Stampede	Beltline Total	17,818 17,818	Commercial Corridor Commercial Multi-Residential Community Service	0	10,100
<b>North East Line</b>					
Whitehorn	Castleridge Martindale Total	6,329 12,328 18,657	City and Regional Infrastructure Commercial Community Commercial Neighbourhood Commercial Regional Industrial Business Industrial General Low Density Residential Multi-Residential	824	18,600
Rundle	Whitehorn Horizon Industrial Total	11,665 16 11681	Commercial Corridor Commercial Neighbourhood Commercial Regional Community Institution Low Density Residential Multi-Residential School, Park, Community Reserve	350	13,400
Marlborough	Marlborough Park Total	8,536 8,536	City and Regional Infrastructure Commercial Community Commercial Corridor Commercial Regional Low Density Residential Multi-Residential School, Park, Community Reserve	485	17,600
Franklin	Albert Park / Radisson Heights Total	6,192 6,192	Commercial Corridor Commercial Neighbourhood Commercial Office Community Institution Community Service Industrial Business Industrial General Low Density Residential Multi-Residential School, Park, Community Reserve	578	5,800

**Table I Continued**

<b>Station</b>	<b>Surrounding Communities</b>	<b>Population<sup>2</sup></b>	<b>Land Use<sup>2</sup></b>	<b>Parking<sup>3</sup></b>	<b>LRT Ridership<sub>3</sub> (per day)</b>
Barlow	Albert Park / Radisson Heights Total	6,192 6,192	Community Service Future Urban Development Industrial Business Industrial General Recreation Urban Nature	50	2,200
Zoo	Bridgeland / Riverside Total	5,251 5,251	Future Urban Development Multi-Residential Recreation	0	1,700
Bridgeland	Bridgeland / Riverside Total	5,251 5,251	Community Service Low Density Residential Multi-Residential Recreation School, Park, Community Reserve Urban Nature Future Urban Development	0	1,900
<b>North West Line</b>					
Dalhousie	Silver Springs Dalhousie Varsity Total	9,177 8,981 12,099 30,257	City and Regional Infrastructure Community Commercial Community Institution Future Urban Development Low Density Residential Multi-Residential Recreation School, Park, Community Reserve	740	18,300
Brentwood	Varsity Brentwood Total	12,099 6,195 18,294	City and Regional Infrastructure Commercial Corridor Commercial Regional Community Institution High Density Residential Low Density Residential Multi-Residential School, Park, Community Reserve University Research Park	1381	14,900
University	University of Calgary Charleswood Total	2,242 3,487 5,729	Commercial Neighbourhood Commercial Office Community Institution Community Service Low Density Residential Multi-Residential School, Park, Community Reserve	0	16,100
Banff Trail	Banff Trail University of Calgary Total	3,759 2,242 6001	Commercial Corridor Commercial Neighbourhood Community Institution Community Service Low Density Residential Multi-Residential Recreation	1381	5,600

**Table I Continued**

Station	Surrounding Communities	Population <sup>2</sup>	Land Use <sup>2</sup>	Parking <sup>3</sup>	LRT Ridership <sub>3</sub> (per day)
Lion's Park	Hounsfield Heights / Briar Hill Capitol Hill Banff Trail Total	2,905 4,058 3,759 10,722	Commercial Corridor Commercial Neighbourhood Community Institution Community Service Low Density Residential Multi-Residential School, Park, Community Reserve	0	5,800
SAIT	Hounsfield Heights / Briar Hill Hillhurst Total	2,905 5,333 8,238	Commercial Corridor Community Institution Community Service Future Urban Development Low Density Residential Multi-Residential Recreation School, Park, Community Reserve Urban Nature	0	11,000
Sunnyside	Hillhurst Sunnyside Total	5,333 3,661 8994	Agriculture Commercial Corridor Community Service Low Density Residential Multi-Residential Recreation School, Park, Community Reserve Urban Nature	0	10,400

### 3.2.2. Do They Work?

Based on the station statistics summarized in Table I certain stations have low ridership numbers such as:

- Erlton at 1,600
- Barlow at 2,200
- Zoo at 1,700
- Bridgeland at 1,900

These stations are within a comparable distance to the downtown core as Sunnyside, Stampede and SAIT which all have ridership numbers above 10,000 people per day along with minimal to no available parking.

Looking closer at the land use breakdown Sunnyside, Stampede and SAIT all have a more diverse mix of land use, whereas, Erlton, Barlow, Zoo and Bridgeland are currently lacking on either density or diversity of land use. This would explain the lower ridership numbers.

The amount of available parking at certain stations also plays a factor. Stations such as Somerset/Bridlewood, Anderson, Dalhousie, Brentwood, and Whitehorn all provide a significant amount of parking. These stations are located near the ends of each line and therefore provide service to commuters on the fringes of Calgary and to communities outside of Calgary. Therefore, these high ridership numbers are a result of commuters and not necessarily from an appropriate TOD land use mix.



For example, Sommerset/Bridlewood station is located within a community of good land use diversity with a major high school, a YMCA, residential uses and plenty of commercial. However, all the commercial uses in the area are big box retail which is not conducive to transit use. The high school also has a catchment area that would only include one other transit station north of Sommerset/Bridlewood; therefore, it is unlikely students from this school are utilizing the LRT system.

Therefore, the higher ridership numbers associated with some of these stations can be deceiving since they may be high due to the amount of available parking and not necessarily due to a properly planned TOD area.

## **4. TOD in Calgary**

### **4.1. Land Use Planning**

The City of Calgary recognizes how important of a role land use plays in creating a successful TOD community. The City is currently re-assessing LRT stations and putting forward new land use plans to better utilize the potential of these LRT stations.

The City selected six stations to undergo Station Area Planning (SARP)<sup>4</sup> to create more effective use of the existing stations. The stations selected were:

- Chinook
- Lions Park
- Banff Trail
- Brentwood
- Anderson
- Canyon Meadows

Looking at the Chinook SAP study as an example, the aim was to obtain a land use balance by applying six principles as illustrated in Figure III.

The SARP for the Chinook LRT Station determined that the development between MacLeod Trail and the LRT line should be redeveloped from the current big box retail (Home Depot, Staples, PetSmart, Office Depot, etc) and industrial type uses, as illustrated in Figure IV, to mixed use, retail mixed use and large format retail use as illustrated in Figure V.

It is proposed to significantly reduce the amount of large format retail and replace it with mixed uses that would see retail on the main floor and then residential or office uses on higher floors. This would encourage more work/live situations that would reduce the amount of vehicular traffic being generated by these units. This approach in land use evaluation was applied to the other five stations.

### **4.2. Mobility Assessment & Plan**

#### **4.2.1. What is the Mobility Assessment & Plan**

As Calgary continues to grow, City staff have recognized the importance in planning existing and future communities properly. To do so Plan|It Calgary was established. Plan|It Calgary is a long term vision for the City to create a sustainable city through land use planning and mobility. Plan|It is currently nearing completion, and is planned to go to City Council for approval during Summer 2009.

One of the mandates of Plan|It Calgary was to develop study guidelines to meet the needs of transportation which resulted in the Mobility Assessment & Plan or MAP guidelines. The goal of the MAP guidelines are to expand on the current Transportation Impact Assessment (TIA) work being submitted for developments.

MAPs differ from standard TIAs in many respects:

- The catchment area of a MAP is typically much larger than a TIA to take into account both the catchment area of the TOD, and existing transportation issues in the surrounding community.
- A review of multiple modes of transportation, with an increased focus on active and transit modes
- Parking is also a key element of MAPs.
- An explanation of the impact on the surrounding area and recommendations to mitigate the effects of the additional density
- provide a list of necessary on- and off-site hard and soft (i.e. policies) infrastructure necessary to support the TOD development
- Phased development and multiple scenarios (such as high vs. low acceptance of TDM strategies) are analyzed
- The public is engaged throughout the process of completing a MAP study

The MAP document is in the process of being reviewed by City staff and outside engineering consultants, and the first test case MAP is underway, for the Brentwood TOD proposal.

Similar to TIA reports, MAP reports would be completed by outside engineering consultants and reviewed by City staff. Since the study area for a MAP study would encompass a much larger area, input from a much wider variety of stakeholders would be required than what is typically for standard TIAs.

To create a MAP instead of a TIA will require the consultant and developer to work with City Transportation staff at a much earlier stage in the development of a site plan and to identify improvements early rather than at a stage when it is quite often too late to make changes. This will create additional work for specialists such as those in Transit Planning, but it will be worth the improved outcome of development site review including transit service requirements and pedestrian circulation. However, this has the benefit of resulting in less wasted time and effort later in the process, since fewer revisions should need to be made.

A challenge in creating MAP studies is that they cannot be static documents. Key to MAPs is the ability to come back and revise assumptions in the future, which will allow MAP studies to continually be accurate depictions of what is happening at present, and the best estimate of the short and long term visions for the area from a transportation perspective. It is totally reasonable to expect a MAP to change over time as assumptions change.

The current guidelines for a MAP study propose to investigate the following in detail:

- demographics
- station and parking lot layout design
- connectivity/network/active modes
- parking rates

- TIA and the impact of TOD on the existing network
- level of service / quality of service measurements
- mitigation measures / levy requirements
- feedback
- risk assessment

### **4.3. Other Examples of Transit Development in Calgary**

In Calgary, the majority of potential sites for successful TOD are related to the LRT stations. However, new developments are investigating the potential for transit hubs and pedestrian facilities. Projects like the example discussed here are steps developers are taking to encourage transit use and provide more diverse density.

#### **4.3.1. Sage Hill Crossing Transit Hub**

Sage Hill Crossing is a retail, residential, and office development located in north west Calgary (Figure VI). As part of this development the developer is proposing a transit hub that would provide local service to the surrounding communities, as well as express service to the downtown core.

The transit hub will be located in the underground parking lot of a one million square foot office building, which will also include retail on the main floor. This transit hub will provide service for not only the office uses but also the proposed 4,500 plus residential units located within the Sage Hill Crossing development as well as neighbouring residential communities.

Along with transit service, pedestrian continuity was also considered. The developer took advantage of future regional pathways and tied these into the natural topography of the site.

The proposed transit hub should be effective based on the location and the surrounding land uses; however, there are still components which do not make it a true TOD. These include:

- Due to the location of the site relative to the city, it was recognized that this transit hub will also be utilized by commuters from the Municipal District of Rocky View, Cochrane and possibly Airdrie; therefore, the transit hub will also consist of a 900 parking stall Park 'n Ride. As discussed earlier providing such a large number of stalls can discourage users from fully utilizing transit.
- The development does consist of a diverse mix of high density residential, retail and entertainment uses; however, a portion of the development is focused on big-box retail which isn't conducive to transit use.

Even though the development does not meet all requirements for a true TOD it does indicate that developers are considering transit and the benefits of providing for it. The developers of Sage Hill Crossing have taken steps such as:

- Providing space and infrastructure to support the transit hub.
- Providing pedestrian continuity within the site and with major connections to regional paths.
- Working with City of Calgary and Calgary Transit staff to provide a facility that will tie in with future plans.
- Plan for adequate residential and office densities to support the transit hub.
- Phase the development so that the transit hub is established early in the development.

Components of the Sage Hill development indicate that developers are more aware of the benefits of providing facilities to support all modes of transportation and a diverse land use mix. However, there is a challenge when dealing with sites such as Sage Hill that are located on the City boundary and provide service for more than the community.

## 5. Conclusions

Calgary has recently undergone a large transformation with population numbers spiking and residents trying to adjust to issues that are more common in larger centres. As such the City of Calgary has recognized the importance in providing not only a good transit system, but also viable TOD communities.

To create a successful TOD area the following should be considered:

- a good mix of land use types and densities so the community is active at all times; is attracting people during all times of the day and week
- provide functional well planned transit; if transit isn't used then there will be traffic and parking issues
- an appropriate amount of parking is provided to sustain a successful TOD area
- safe facilities for all modes of transportation (such as cyclists and pedestrians) should be provided so that there is continuity throughout the TOD area

In order to achieve these results the City of Calgary has implemented steps such as:

- re-evaluate land use plans at existing and future LRT stations
- conducting SARP studies on selected LRT stations
- implement the MAP guidelines to identify the feasibility of proposed TOD sites as part of a mandate from PlanIt Calgary ; these studies would be in addition to the typical TIA studies that are conducted

Developers are recognizing the benefits of moving towards creating TOD areas by:

- providing appropriate land use mixes and densities
- discussing the benefits of transit and pedestrian facilities with City staff and including them in future developments

Many of the stations and transit hubs in Calgary are far from meeting TOD requirements; however, with the steps that both the City and developers are taking true TOD communities will start to form.

## 6. References

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Figure I: Land Use at Bloor Subway Station in Toronto

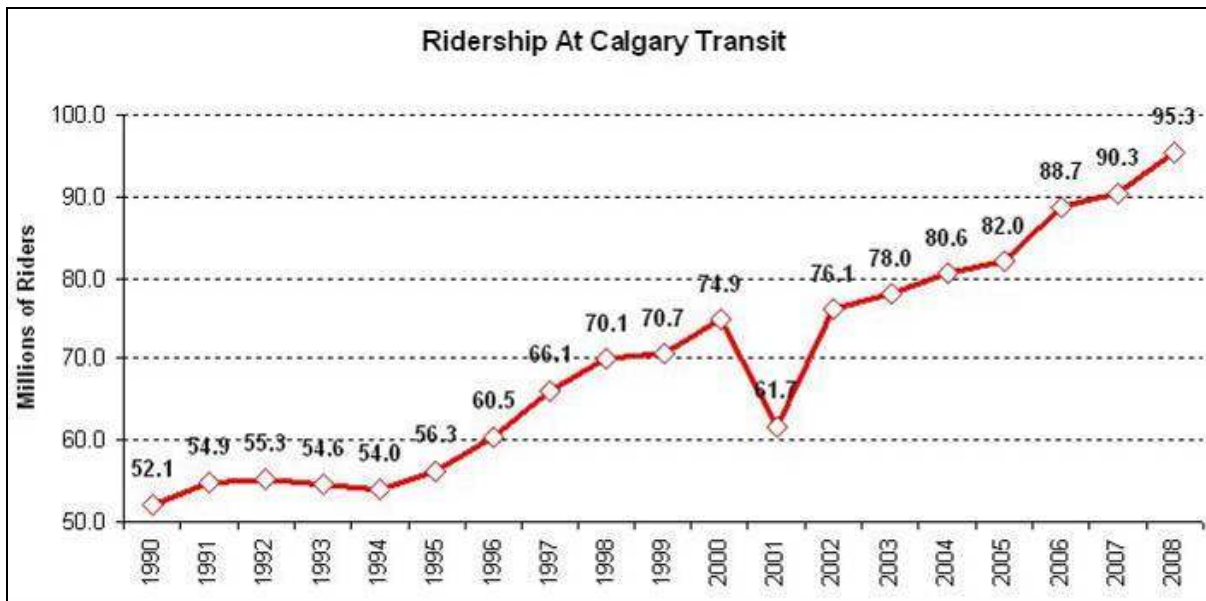


Figure II: Annual Transit Ridership in Calgary<sup>5</sup>



- Land Use: Mixed-use developments that support pedestrian activity.
- Built Form & Site Design: Buildings must front the street and be multi-storied.
- Public Realm: Will be a primary social space within the station area - the community's outdoor living room.
- Mobility: Will be balanced with an emphasis on pedestrian, transit and cycling travel modes.
- Parking: Will be on-street, behind buildings or underground.
- Investment: Improvements to the area will occur as a result of a combination of public sector and private sector investments.

Figure III: Land Use Planning Strategy<sup>6</sup>

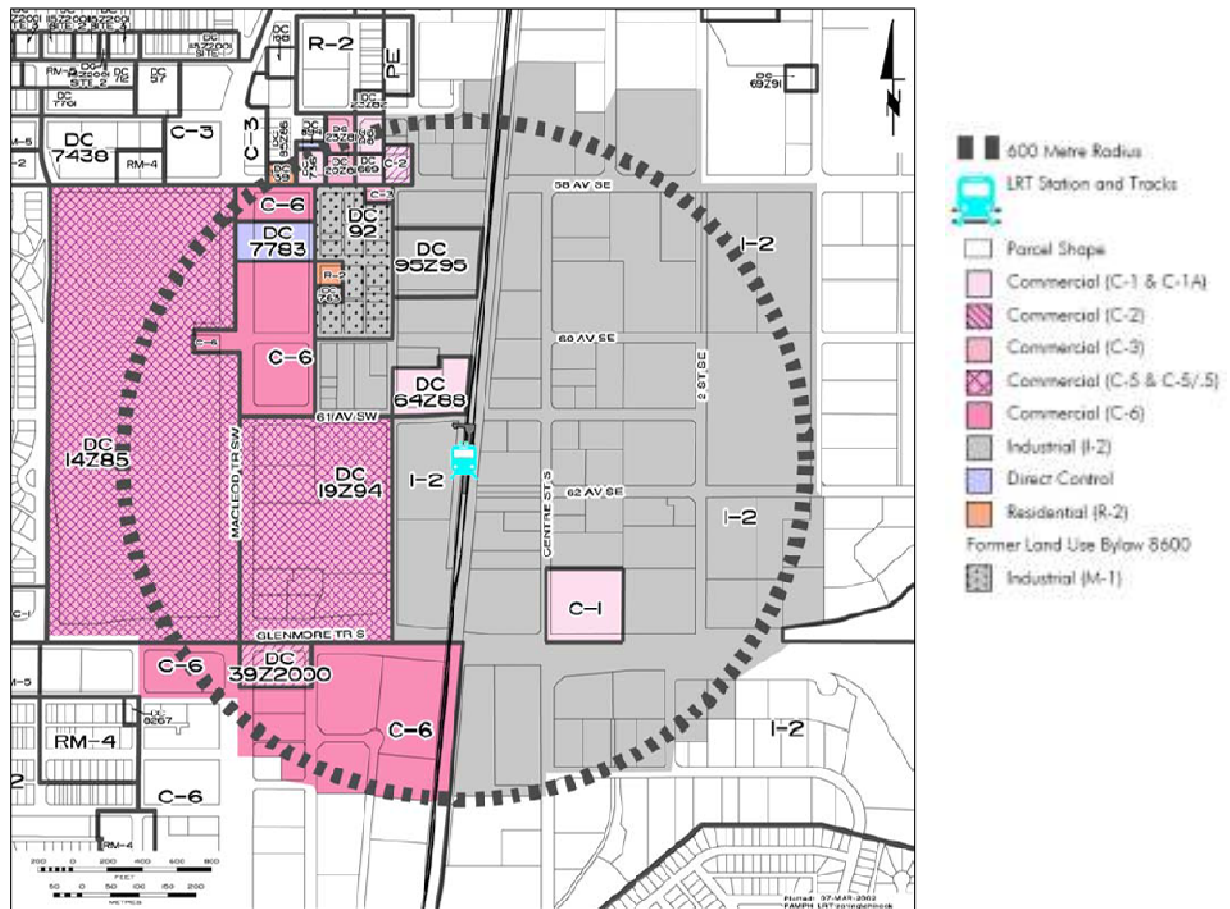


Figure IV: Chinook LRT Station Existing Land Use Plan<sup>7</sup>

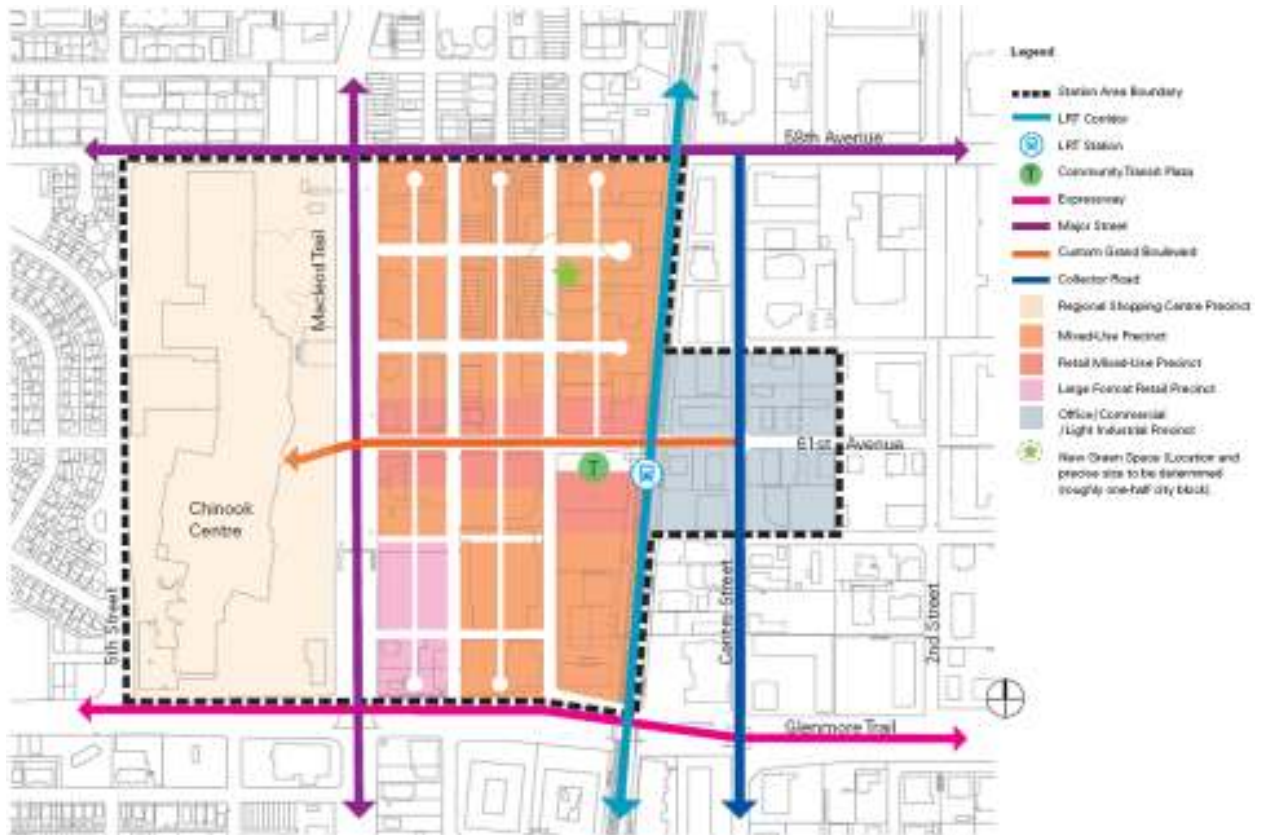


Figure V: Chinook LRT Station Land Use Plan as per the SARP<sup>6</sup>





Figure Vi: Sage Hill Crossing Location<sup>8</sup>