Eric Vance & Associates
Planning and Management Consultants

Industrial Land Intensification Analysis

Prepared for Metro Vancouver

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In association with

VANNSTRUTH
CONSULTING GROUP

7 Wildwood Drive
Port Moody, B.C. V3H 4M7
Tel: (604) 469-3325 Fax: (604) 469-3356
Email: ecvance@shaw.ca
www.vanceconsulting.ca

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Executive Summary

There are competing demands for much of Metro Vancouver's developable land. One result is that the region has among the highest industrial land prices in North America.

The continued rise in industrial land prices could affect the Metro Vancouver economy in a number of ways. Some existing businesses might relocate elsewhere and other businesses could be deterred from locating or expanding in the region. There could also be an impact on Metro Vancouver's Gateway function, local employment opportunities, and the cost of goods produced and handled in the region.

In response, Metro Vancouver's draft Regional Growth Strategy (RGS) includes a strategy to "protect the supply of industrial land" in the region. The role identified for municipalities to help support this strategy is to adopt Regional Context Statements that include policies to "encourage better utilization and intensification of industrial areas for industrial activities."

This Industrial Land Intensification Analysis study has been undertaken to explore development factors that induce or inhibit more efficient use of industrial land in the region, some of which is significantly under-utilized, and recommend potential actions that could be taken by municipalities, the development industry and Metro Vancouver to promote and facilitate industrial land intensification. The analysis focuses on land designated in the draft RGS as "Industrial".

Industrial Trends in Metro Vancouver

The industry sectors that are most concentrated on industrial land in Metro Vancouver are manufacturing, wholesale trade and transportation/warehousing. Measured by employment, these sectors are growing more slowly than the regional economy overall and are consequently making up a smaller percentage of total employment over time. Employment is often not the best indicator of the demand for industrial land, however, as many types of industrial operations increasingly require less labour to achieve the same or higher levels of output and value-added.

The volume of cargo shipped by container through Metro Vancouver has more than doubled in the last 10 years and this is the cargo type most associated with increased demand for warehousing and transhipment facilities. Most of the largest and most efficient of these facilities are highly automated and require relatively little labour relative to the volume of economic activity occurring onsite. Industrial floorspace data supports this trend as the inventory of floorspace has increased about three times faster than employment in the main industry-related sectors over the last decade.

Employment density in the region (jobs per unit of floorspace) appears higher than the competing markets of Seattle and Portland (although the data is limited). The growth of lower-employing warehousing functions may limit the potential to significantly increase the employment density of industrial land in the near future. Building densities per unit of industrial land are also unlikely to increase significantly due to the constraints of technology (most industrial operations cannot efficiently operate on more than one floor) and the need for outdoor space for truck and goods movement.

Industrial Development in Other Metropolitan Areas

Six other metropolitan areas - Calgary, Edmonton, Seattle, Portland, San Francisco and Los Angeles - were examined to learn how they are managing their industrial lands and if they are employing strategies to intensify use that can be applied in Metro Vancouver.

It was found that all of these metropolitan areas are interested in ensuring that efficient use is made of their industrial land. But, each jurisdiction has a different view of what "intense" means and also of the uses that are appropriate for industrial areas.

Industrial development averages a Floor Area Ratio (FAR) of around 0.3 in most parts of these metropolitan areas and rarely exceeds 0.5 FAR. Moreover, average industrial densities do not appear to be significantly increasing, partly because of sufficient supply of industrial land or space and also because economic conditions have dampened demand.

Examples of somewhat higher densities can be found in the core areas of Portland, Seattle and San Francisco, where there are multi-storey buildings from an era when industry functioned in a different way and the infrastructure was not in place to accommodate dispersed development. However, where there are higher densities, they are often because non-accessory retail and office uses are permitted on at least a limited basis.

Metro Vancouver Industrial Development

Seven industrial areas were selected for analysis in Metro Vancouver:

- Campbell Heights, Surrey
- Tilbury, Delta
- Big Bend, Burnaby
- Gloucester, Langley Township
- Marine Drive, Vancouver
- Cambie/Clark, Vancouver
- Newton, Surrey

It was found that an FAR of 0.5 – 0.6 is the upper end of the density being achieved by most newer industrial developments in Metro Vancouver. There are a few examples of developments that are exceeding this density, but they typically include a significant office component that is not necessarily accessory to the primary industrial use.

The densities being achieved reflect the types of users seeking industrial land, many of which have a transportation component that requires large surface areas for loading and tractor trailer manoeuvring. Some also have outdoor storage and/or production needs that further reduce density as measured by FAR or building site coverage.

Some increase in the average intensity of industrial land use is expected in the short to medium term through new development. However, a major boost in the intensification of industrial land is not anticipated in the foreseeable future. There is still enough available in the region on both greenfield and brownfield sites to meet most types of demand in conventional development forms.

With rare exception, warehousing and manufacturing do not occupy space above the ground level in multi-storey buildings, which is primarily a function of economics, not zoning restrictions on density.

While some may consider the intensity of use of Metro Vancouver's industrial land to be low, comparison to the six metropolitan areas that were reviewed by the study suggests that Metro Vancouver has better overall utilization of its industrial land than most comparable jurisdictions.

Factors Influencing Industrial Land Intensification and Recommended Actions

The intensity of land use is affected by a variety of factors, but not in a simple, straightforward fashion since many of the factors are strongly inter-related and their degree of influence can vary. The type of industrial use is the most important factor, with some activities better able to intensify (if the measure is FAR or building site coverage) than others based on the nature of their operations.

Land values and location are also key factors, with the highest densities (as measured by FAR) generally found in areas of the region with the highest land values. These are in turn a function of location.

But this is not an absolute. How intensely a business chooses to use a piece of land is not always reflected in FAR or site coverage. Some businesses place a high value on the ability to have at least some outdoor storage and/or production capabilities and also want to be in relatively central locations in the region, even if they have to pay more for land.

Industrial land use is intensifying in some cases without increased FARs and site coverage by using buildings with higher ceilings, especially in warehousing. With greater storage/racking capacity, much more efficient use can be made of a given area of floorspace.

Other important factors are building setback and parking regulations, which can create wasted space if set too high.

Zoning regulations are important factors, but overall are not the main impediment in most cases to industrial land being more intensely used. Nevertheless, there are a number of changes to aspects of industrial zoning provisions that could help modestly increase the intensity of use on at least some industrial land in some locations within Metro Vancouver.

Municipal Actions

There are dozens of different industrial zones in Metro Vancouver municipalities, some of which reflect outdated views of how industry operates and the economics of development. Municipalities might consider whether their industrial zones and related policies should be updated for a variety of reasons, one being to encourage greater intensification. Topics include:

- Reviewing the types of primary and accessory uses permitted on industrial land and how they are defined.
- Increasing the maximum allowable building site coverage where municipalities wish to specify site coverage restrictions.
- Increasing the maximum permitted Floor Area Ratio (FAR).
- Reducing building setbacks.
- Reviewing the appropriateness of industrial landscaping standards.
- Increasing maximum permitted building heights.

- Rationalizing parking and loading standards.
- Considering allowing shared driveways between industrial properties.
- Reviewing if road standards in industrial areas are excessive.

Development Industry Actions

The development industry, including real estate brokers, needs to be involved in an organized way in helping the regional and municipal policy-makers and land use regulators understand industrial development trends, the economics of industrial land development, the kinds of businesses seeking industrial land and their needs. The focus should be on giving sound technical information and advice that can be translated into OCP and other policies, zoning and other land use regulations.

Metro Vancouver Actions

Building on the draft RGS, Metro Vancouver has a role in educating the public, developers, municipal officials and politicians about industrial land use issues in the region.

There is also a coordinating role that Metro Vancouver can play in continuing to move the process along on the practical ways that industrial land can be better utilized through zoning and other mechanisms. For example, an advisory committee composed of municipal planners and engineers and industrial developers and real estate brokers could be created, supported by Metro Vancouver staff, to review the issues and offer workable ideas and solutions for consideration by municipalities and the development community.

Metro Vancouver should continue to track the inventory of industrial land in the region and also measure its utilization. There is also more research needed on the relationships between industrial land, transportation infrastructure and jobs in the region.

1. Introduction

Metro Vancouver's economy has undergone a major transformation in recent decades, with less reliance on traditional resource based industries and greater emphasis on service oriented activity. This is evident in the region's land use pattern, which has seen the closure of many of the wood processing operations that once dominated the Fraser River waterfront and the loss of much of the region's primary metal manufacturing capacity. Some of the sites that housed these operations have redeveloped for a new generation of industrial uses and others have been converted to commercial and residential uses. In other cases, however, older industrial sites have not redeveloped and some are continuing to be used for low intensity outdoor manufacturing and/or storage activities.

While not as dominant as it once was as a share of total employment, business activity on industrial land (collectively referred to as "industry") continues to be a vital part of the regional economy. There is a large and growing marine port sector along with other goods handling activities tied to Metro Vancouver's gateway function. Value added manufacturing is on the rise in sectors such as food processing, metal fabrication, plastics and furniture.

Industry does not operate in isolation. There is a strong link between the region's goods producing and handling sector and the service sector. Functions such as finance and insurance, repair and maintenance, and professional, scientific and technical services derive part of their income from serving the needs of Metro Vancouver's industrial businesses. In turn, industry supplies these service sectors.

The important role of Metro Vancouver's industry to not only the local economy but also the provincial and national economies is generally understood. What is less well understood is the relationship between industrial activity and land use.

There are competing demands for much of the region's developable land. Commercial and residential uses are almost always able to outbid industry for sites given the opportunity. The result is that industrial land prices in the region are climbing – ranging from around $500,000 per acre in the outer municipalities to $3.0 million or more in some areas of Vancouver and Burnaby. These are among the highest industrial land prices in North America.

Industrial land prices affect business costs and therefore competitiveness, especially for exporting companies that compete with similar companies in lower-cost regions. In response to Metro Vancouver's rising land costs, some businesses have relocated outside of the region to places such as Calgary, which has emerged as a major warehousing and distribution centre for western Canada. There is also concern that rising industrial land prices could deter some businesses from locating or expanding in Metro Vancouver.

Higher land prices are a reality in most regions with growing economies and rising populations, especially in an area like Metro Vancouver with limited room for outward expansion due to the physical constraints of the region and the Agricultural Land Reserve. Many in government and industry believe that Metro Vancouver's economy will be negatively impacted if efforts are not made to protect industrial land from large scale conversion to other uses. It is not just industry that will be affected if industrial land prices continue to rapidly rise but also other sectors of the economy linked to industry as suppliers and customers.

1.1 Metro Vancouver's Regional Growth Strategy

There are many factors that will affect the future of industry in Metro Vancouver. Most are national or global in scale and well beyond the ability of the region to control. But, one area where there is considerable opportunity for local influence is land use planning.

This is recognized in Metro Vancouver's draft Regional Growth Strategy (RGS), which has established "Support a Sustainable Economy" as one of its five goals. Among the strategies to achieve this goal is to "protect the supply of industrial land." [1] The draft RGS defines industrial related land as falling into two categories:

- "Industrial," which are areas primarily intended for heavy and light industrial activities and appropriate accessory uses. These industrial areas are the focus of this study.

- "Mixed Employment", which:

  - supports a mix of industrial, commercial, office and other related employment uses, while maintaining support for established industrial areas, including potential intensification policies for industrial activities, where appropriate; and

  - allows large and medium format retail, where appropriate, provided that such development will not undermine the broad objectives of the RGS.

The draft RGS identifies the role of Metro Vancouver in helping protect the supply of industrial land as being:

- Monitor the supply of, and demand for, industrial land in the region with the objective of assessing whether there is sufficient capacity to meet the needs of the regional economy.

- Work with the province, municipalities and other agencies to investigate industrial taxation rates and policies that support industrial activities.

- Accept Regional Context Statements that protect and support the ongoing economic viability of industrial activities and that meet or work towards actions identified for municipalities.

The draft RGS identifies the role of municipalities to help protect the industrial land base as being to adopt Regional Context Statements that include policies which:

- Support and protect industrial uses.

- Support appropriate accessory uses, including commercial space and caretaker units.

- Exclude uses which are inconsistent with the intent of industrial areas, such as medium and large format retail, residential uses (other than industrial caretaker units where necessary), and stand-alone office uses that are not supportive of industrial activities.

- Encourage better utilization and intensification of industrial areas for industrial activities.

[1] *Metro Vancouver 2040: Shaping Our Future*, January 14, 2011, Regional Growth Strategy Bylaw No. 1136, 2010, page 27.

1.2 Study Purpose and Objectives

This Industrial Land Intensification Analysis (ILIA) study has been undertaken jointly by Eric Vance & Associates and Vann Struth Consulting Group on behalf of Metro Vancouver to assist in understanding how industrial land in the region can be intensified.

The study examines industrial land, not mixed employment land. It offers practical advice on possible ways in which a combination of actions, including by municipalities, developers and Metro Vancouver, can help increase utilization.[2] Ultimately the intensity of land use will be determined by the choices of individual companies striving to compete both locally and globally who will structure their operations most efficiently for their purposes. Changes in land use intensity are therefore limited by the kinds of businesses currently seeking industrial sites in the region and the economics of development (i.e. what is financially feasible for these companies to undertake). Change will happen, but it will not be quick.

The study complements two other industrial land studies by Metro Vancouver:

- An update of the *Industrial Lands Inventory for Greater Vancouver – 2005* (June 2006). This study will be completed in early 2011.

- An industrial land demand study, which will begin in 2011. The findings of this ILIA study will assist Metro Vancouver in developing some of its assumptions for the demand analysis on how industrial land may be utilized in the future.

Within this context, the objectives of this ILIA study are to:

- Explore development factors that induce or inhibit more efficient use of industrial land in the region.

- Recommend potential actions that could be taken by municipalities, developers and Metro Vancouver to promote and facilitate industrial land intensification.

This will help Metro Vancouver and its partners in several ways, including to:

- Promote the strategic, efficient and effective use of the region's limited land base.

- Accommodate future growth of economic sectors requiring a designated industrial land base.

- Support more industrial jobs on industrial land.

[2] The terms "utilization" and "intensification" are used interchangeably in this report. They are intended to mean the same thing, namely how much industrial activity is taking place on industrial land. Where the term "density" is used, it is meant to refer specifically to Floor Area Ratio.

1.3 Study Scope

Intensification of industrial land can take a number of forms. From a land use planning perspective, this typically means finding ways to:

- Use industrial lands for industrial purposes.
- Increase building floorspace, usually measured in relation to the size of the lot, called the Floor Area Ratio (FAR).[3]
- Increase building site coverage, which is the ratio of a building's footprint to lot size.
- Intensify outdoor storage or production (where permitted).
- Increase industrial employment on industrial land.

It is also important to understand the perspective of the business users of industrial land. Their goal is to operate profitably over an extended period of time, so increasing the number of jobs or using a larger building or otherwise making more intense use of land will be done only if these changes can be financially justified. However, they do have an interest in using land and buildings as efficiently as possible, as with all of their inputs, so there is a point where land use planning and business interests intersect in terms of the desire for increased utilization.

1.4 Information Sources

This study included input from a number of groups and individuals, all of whom are listed in Appendix 1. Their assistance in providing information and advice is gratefully acknowledged, as is that of Metro Vancouver staff.

The consultants express their appreciation in particular to the Industrial Committee of the Urban Development Institute and the NAIOP Commercial Real Estate Development Association, as well as to staff of the Beedie Group, who were very generous in providing data and sharing their insights on industrial land development in Metro Vancouver.

Reports and other documents that were reviewed are listed in Appendix 2 and cited in the main body of this report as appropriate.

1.5 Report Structure

The remainder of this report is structured as follows:

- Chapter 2 discusses industrial trends in Metro Vancouver and identifies the types of industries that will be the source of much of the demand for industrial land in the foreseeable future. It also examines employment densities by type of use.

[3] Floor Area Ratio (FAR) - sometimes also called Floor Space Ratio (FSR) - refers to the total square feet of a building divided by the total square feet of the lot the building is located on. For example, an FAR of 0.5 means that the total square feet of a building on a lot is exactly half the total square feet of the lot. The higher the FAR, the more dense the construction on a lot.

- Chapter 3 looks at some other metropolitan areas in western Canada and on the US west coast to learn how they are managing industrial land use planning and if intensification is occurring.

- Chapter 4 examines the characteristics of typical industrial developments in Metro Vancouver to identify differences and similarities in intensity of use.

- Chapter 5 discusses the factors that most influence how industrial land is used in Metro Vancouver and opportunities for intensification.

- Chapter 6 recommends potential actions to encourage industrial land intensification in Metro Vancouver.

2. Industrial Trends in Metro Vancouver

The ways in which industrial land is used in Metro Vancouver are influenced by changes in the regional and global economies. This section of the report explains some of these factors, including the current structure of the regional economy, how that structure has evolved over time, which sectors are the predominant users of industrial land, how industrial land development and prices have changed in different parts of the region in recent years, and how employment densities vary by type of industrial activity. Comparisons are made to other metropolitan regions in western Canada and the United States.

Note that in this chapter the words “industry” and “industry sector” are used to refer to the type of economic activity, regardless of land use. From this perspective every job is part of an industry – retail clerks work in the Retail Trade industry sector, government workers are employed in the Public Administration industry sector, and schoolteachers work in the Education industry sector.

Reference is also made at various points to NAICS, which is the “North American Industry Classification System” that is used to organize economic data by industry sector in Canada, the United States and Mexico.

2.1 Industrial Structure

The Metro Vancouver economy is very diverse, with no single dominant industry that drives the regional economy. It is simultaneously the administrative and service centre for BC’s resource industries, a major transportation gateway and goods distribution centre, a world-renowned tourism destination, home to an array of emerging technology-focused industries, and has highly-developed education, health care, recreation and many other industries that serve the region’s residents.

While the Metro Vancouver economy is generally very similar to the other western metropolitan areas examined in this report (Calgary, Edmonton, Seattle, Portland, San Francisco and Los Angeles), it has the most diversified mix of industry sectors even within this group.

Regional employment in 14 broad industry sectors is shown in Table 1. In only two of these sectors does Metro Vancouver have the highest share among the seven western metropolitan areas, and in no sector does Metro Vancouver have the lowest share. (Note that the use of non-farm employment and the combination of sectors shown in the table is to allow for comparisons to the US cities.)

Table 1: Non-Farm Employment Distribution and Rank among Western Metro Areas, 2006

Industry Sector	Metro Vancouver		Rank Among 7 Western Metro Areas[4]
	Jobs	% of Total	
Mining, Oil & Gas, Logging	5,340	0.5%	3rd
Construction	73,385	6.5%	3rd
Manufacturing	97,800	8.6%	4th
Wholesale trade	61,650	5.4%	3rd
Retail trade	124,960	11.0%	**2nd**
Transportation, warehousing and utilities	71,305	6.3%	**2nd**
Information and cultural industries	42,145	3.7%	4th
Finance and insurance	55,640	4.9%	**2nd**
Real estate and rental and leasing	29,575	2.6%	**1st**
Professional and business services	163,375	14.4%	4th
Arts, entertainment and recreation	27,350	2.4%	**1st**
Accommodation and food services	91,580	8.1%	**2nd**
Other services (except public administration)	59,060	5.2%	**2nd**
Government, Education, Health	234,385	20.6%	6th
Total Non-Farm Employment	**1,137,550**	**100.0%**	

Sources: Statistics Canada Census, Washington Employment Security Department, Oregon Employment Department, California Employment Development Department

Table 2 shows which sectors are the predominant users of industrial land, based on employment with a fixed place of work, for the following 18 Major Industrial Areas in the region, as defined by Metro Vancouver (Map 1):

- Annacis Island
- Big Bend
- Cambie/Clark
- Campbell Heights
- Cape Horn
- Crestwood/Bridgeport
- Fraser Port
- Gloucester
- Marine Drive
- Mitchell Island
- Port Kells
- Still Creek
- Surrey Fraser Docks
- Tilbury
- Port Metro Vancouver – North Shore East
- Port Metro Vancouver – North Shore West
- Port Metro Vancouver – Vancouver
- YVR (Airport)

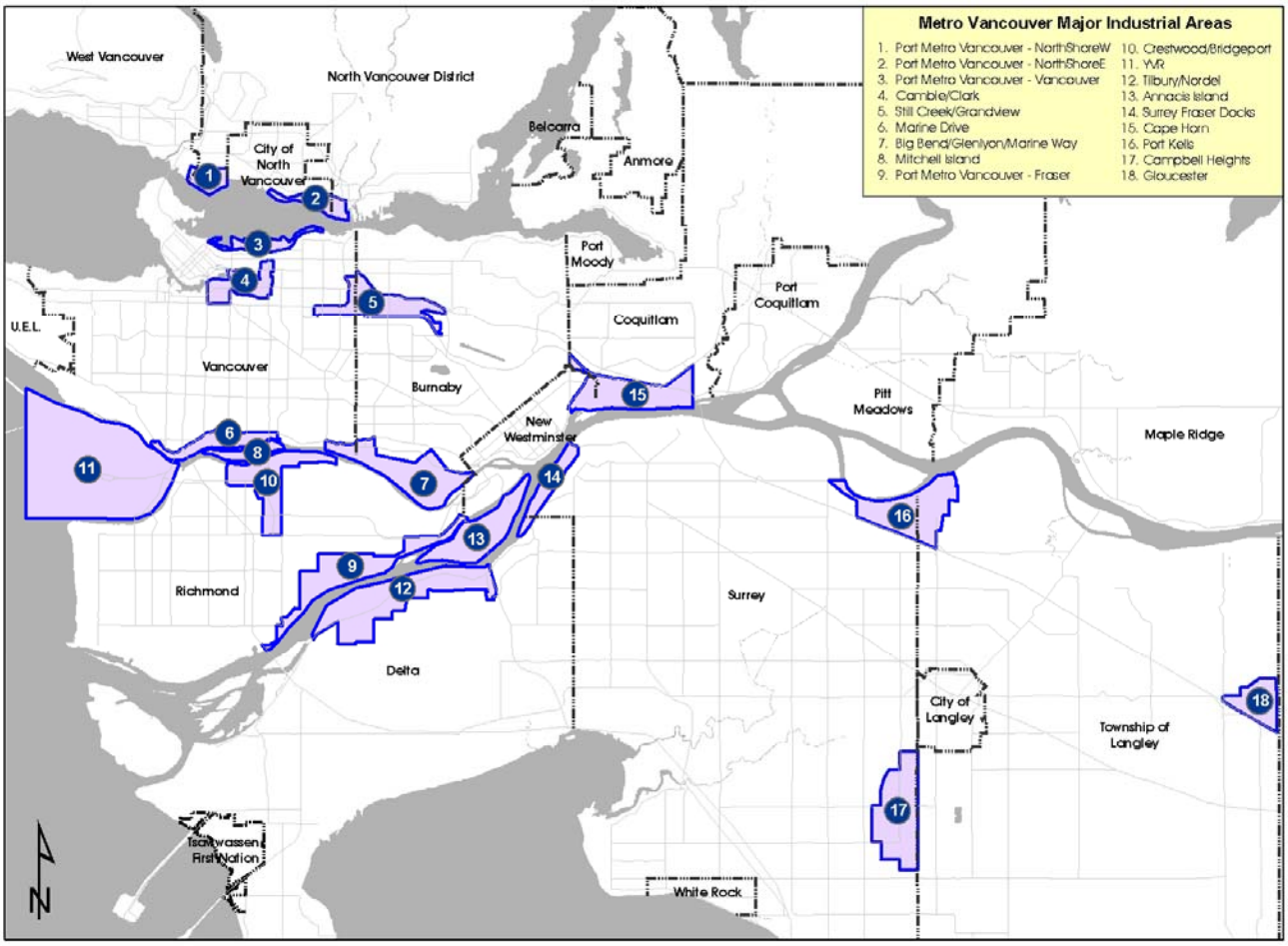
The three sectors with the largest shares of employment in industrial areas are manufacturing, wholesale trade, and transportation / warehousing. These three sectors are also the most concentrated in industrial areas, relative to their share of employment in the overall regional economy (as measured by the location quotient in the far right column of Table 2).

Yet there is still significant diversity in the types of employment found in major industrial areas. Retail trade is the fourth-largest sector. More than 45% of total employment in these areas is not in the three predominant sectors of manufacturing, wholesale trade and transportation/warehousing. To some degree this diversity is due to the inclusion of mixed-use areas such as Cambie/Clark, Still Creek and YVR (Airport) but even the more

[4] Vancouver, Calgary and Edmonton Census Metropolitan Areas (CMAs), Seattle-Bellevue-Everett and Portland-Vancouver-Hillsboro Metropolitan Statistical Areas (MSAs), and San Francisco-San Mateo-Redwood City and Los Angeles-Long Beach-Glendale Metropolitan Divisions (MDs).

conventional industrial areas have significant employment in sectors that appear to have little requirement for industrial land.

Map 1: Major Industrial Areas in Metro Vancouver



Source: Metro Vancouver

Table 2: Employment with Usual Place of Work* in Metro Vancouver and Major Industrial Areas, 2006

Sector (with NAICS code)	Major Industrial Areas		Metro Vancouver		Location Quotient**
	Jobs	% of Total	Jobs	% of Total	
31-33 Manufacturing	40,375	24.6%	91,790	9.4%	2.63
41 Wholesale trade	25,430	15.5%	55,810	5.7%	2.72
48-49 Transportation and warehousing	23,405	14.3%	49,770	5.1%	2.81
44-45 Retail trade	15,060	9.2%	113,620	11.6%	0.79
54 Professional, scientific and technical services	11,455	7.0%	95,965	9.8%	0.71
56 Administrative and support, waste management and remediation services	7,605	4.6%	35,300	3.6%	1.29
23 Construction	7,180	4.4%	31,290	3.2%	1.37
72 Accommodation and food services	6,450	3.9%	81,970	8.4%	0.47
81 Other services (except public administration)	6,155	3.8%	51,490	5.3%	0.71
51 Information and cultural industries	5,000	3.1%	33,745	3.5%	0.88
52 Finance and insurance	3,515	2.1%	52,835	5.4%	0.40
91 Public administration	2,745	1.7%	41,285	4.2%	0.40
53 Real estate and rental and leasing	2,310	1.4%	26,215	2.7%	0.53
71 Arts, entertainment and recreation	2,195	1.3%	22,225	2.3%	0.59
62 Health care and social assistance	1,835	1.1%	98,645	10.1%	0.11
61 Educational services	1,150	0.7%	74,880	7.7%	0.09
11 Agriculture, forestry, fishing & hunting	990	0.6%	10,135	1.0%	0.58
22 Utilities	415	0.3%	5,170	0.5%	0.48
21 Mining and oil and gas extraction	355	0.2%	3,505	0.4%	0.60
55 Management of companies and enterprises	190	0.1%	1,960	0.2%	0.58
Total	**163,795**	**100.0%**	**977,615**	**100.0%**	**1.00**

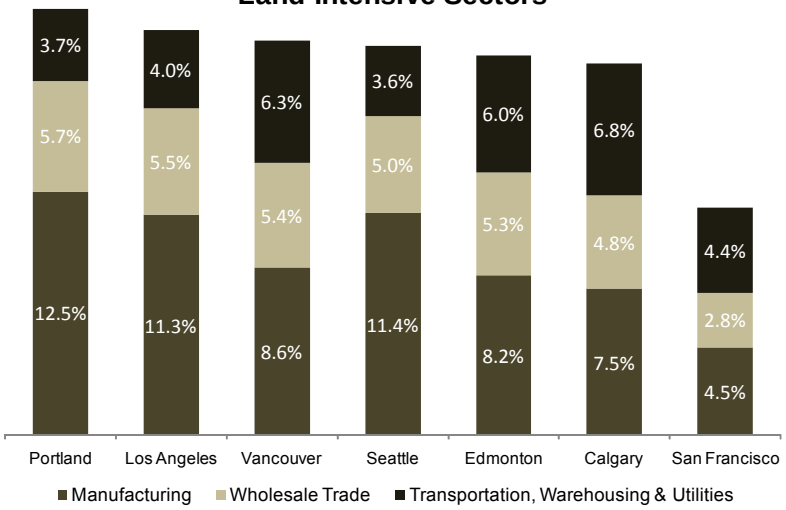
*Jobs data is shown for "usual place of work". This excludes jobs that have "no fixed workplace address", which is common in sectors like construction where workers regularly report to different work sites. This explains why the share of employment in construction is so much less in this table compared to the previous table.

** The location quotient (LQ) shows which sectors are relatively more concentrated in the industrial areas. Sectors with an LQ higher than 1.0 have relatively more jobs in the Major Industrial Areas compared to Metro Vancouver overall, while LQs less than 1.0 indicate relatively fewer jobs in the industrial areas. For example, the LQ of 2.81 for Transportation and Warehousing means jobs in that sector are nearly three times as concentrated in the Major Industrial Areas as the regional average.

Source: Statistics Canada Census

Chart 1 (using data from Table 3) shows how Metro Vancouver's employment in the three sectors that are the greatest users of industrial land compares to other western metropolitan areas. Overall the respective shares of employment are similar, with the exception of San Francisco being much lower.

Chart 1: Non-Farm Employment in Industrial Land-Intensive Sectors



The US metropolitan areas have more employment in manufacturing, but less in transportation and warehousing as a share of their total employment. (The line between these sectors is not clear in all cases. For example, a manufacturing facility that also has warehousing on-site would have all employment classified under manufacturing).

Table 3: Non-Farm Employment Distribution in Industrial Land-Intensive Sectors, Western Metropolitan Areas, 2006

Metro Area	Manufacturing	Wholesale Trade	Transportation, Warehousing & Utilities	Total Industrial Land-Intensive Sectors
Vancouver	8.6%	5.4%	6.3%	20.3%
Calgary	7.5%	4.8%	6.8%	19.1%
Edmonton	8.2%	5.3%	6.0%	19.5%
Seattle	11.4%	5.0%	3.6%	19.9%
Portland	12.5%	5.7%	3.7%	21.8%
San Francisco	4.5%	2.8%	4.4%	11.6%
Los Angeles	11.3%	5.5%	4.0%	20.8%
Average	**9.1%**	**4.9%**	**4.9%**	**19.0%**

Sources: Statistics Canada Census, Washington Employment Security Department, Oregon Employment Department, California Employment Development Department

2.2 Growth Trends

As previously mentioned, the long term trend in Metro Vancouver, and indeed throughout North America, is toward a more services-oriented economy. The industrial land-intensive sectors are continuing to grow, thereby increasing demand for industrial land, but most are growing slower than the overall economy and are therefore shrinking in percentage terms. While this trend has been ongoing for decades, it is particularly evident in the last 20 years in Metro Vancouver.

Table 4 shows the change in employment in the main industrial land-intensive sectors from 1989 to 2009. Over this time period total employment in Metro Vancouver grew by an average of 2.4% per year, but only 1.5% per year in the main industrial land-using sectors. Wholesale trade nearly kept pace by growing at 2.3% per year and transportation and

warehousing expanded 1.7% per year, but manufacturing expanded by an average of only 1.0% per year.

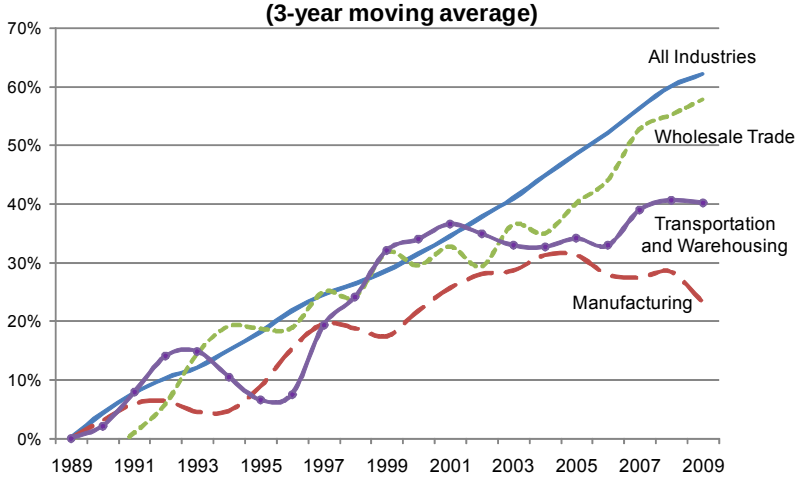
Table 4: Jobs in Industrial Land-Intensive Sectors and Selected Detailed Industries, Metro Vancouver, 1989-2009

	1989*		2009*		1989-2009		
NAICS Sector/Industry	Jobs	% of Total	Jobs	% of Total	Change	Total Growth	Avg. Annual Growth
31-33 Manufacturing	**83,600**	**11.0%**	**103,000**	**8.4%**	**19,400**	**23%**	**1.0%**
311+312 Food, Beverage and Tobacco Product Manufacturing	13,300	1.7%	18,900	1.5%	5,600	42%	1.8%
339 Miscellaneous Manufacturing	4,700	0.6%	9,200	0.7%	4,500	96%	3.4%
325 Chemical Manufacturing	2,100	0.3%	4,500	0.4%	2,400	114%	3.9%
332 Fabricated Metal Product Manufacturing	7,200	0.9%	9,600	0.8%	2,400	33%	1.4%
337 Furniture and Related Product Manufacturing	4,500	0.6%	6,800	0.6%	2,300	51%	2.1%
327 Non-Metallic Mineral Product Manufacturing	2,100	0.3%	4,300	0.3%	2,200	105%	3.6%
326 Plastics and Rubber Products Manufacturing	3,100	0.4%	4,700	0.4%	1,600	52%	2.1%
333 Machinery Manufacturing	3,700	0.5%	5,300	0.4%	1,600	43%	1.8%
334 Computer and Electronic Product Manufacturing	3,200	0.4%	4,800	0.4%	1,600	50%	2.0%
315+316 Clothing, Leather & Allied Product Manufacturing	3,700	0.5%	5,000	0.4%	1,300	35%	1.5%
336 Transportation Equipment Manufacturing	5,600	0.7%	6,900	0.6%	1,300	23%	1.0%
322 Paper Manufacturing	3,500	0.5%	4,100	0.3%	600	17%	0.8%
335 Electrical Equipment, Appliance and Component Manufacturing	1,600	0.2%	1,900	0.2%	300	19%	0.9%
323 Printing and Related Support Activities	6,600	0.9%	5,900	0.5%	-700	-11%	-0.6%
331 Primary Metal Manufacturing	4,000	0.5%	2,100	0.2%	-1,900	-48%	-3.2%
321 Wood Product Manufacturing	11,200	1.5%	7,000	0.6%	-4,200	-38%	-2.3%
41 Wholesale Trade	**35,400**	**4.7%**	**55,900**	**4.5%**	**20,500**	**58%**	**2.3%**
48-49 Transportation and Warehousing	**51,200**	**6.7%**	**71,700**	**5.8%**	**20,500**	**40%**	**1.7%**
485 Transit and Sightseeing Transportation	12,200	1.6%	27,000	2.2%	14,800	121%	4.1%
484 Truck Transportation	9,500	1.2%	16,700	1.4%	7,200	76%	2.9%
491+492 Postal and Courier Services	8,900	1.2%	10,300	0.8%	1,400	16%	0.7%
481 Air Transportation	10,200	1.3%	8,600	0.7%	-1,600	-16%	-0.8%
Total Industrial Land-Intensive Sectors	***170,200***	***22.4%***	***230,500***	***18.7%***	***60,300***	***35%***	***1.5%***
All Industries	**760,800**	**100.0%**	**1,232,800**	**100.0%**	**472,000**	**62%**	**2.4%**

*Annual figures are 3-year moving averages that include the two prior years (so 1989 data is the average of 1987 to 1989). This is done to smooth random variations in the survey results.
Source: Statistics Canada Labour Force Survey

Within manufacturing, the greatest job increase was in food and beverage manufacturing, but at 1.8% per year its growth also lagged overall regional growth of 2.4% per year. Manufacturing industries growing faster than the regional average include:

Chart 2: Total Regional Job Growth in Industrial Land-Intensive Sectors
(3-year moving average)



- miscellaneous manufacturing, which includes medical equipment, jewellery and silverware, toys and games, sporting goods, signs and office supplies (3.4% per year);
- chemicals manufacturing (3.9% per year); and
- non-metallic mineral products, which includes concrete and glass products and pottery (3.6% per year).

Significant job losses have been observed in wood products (-2.3% per year) and primary metal manufacturing, which includes wire, steel pipes and tubes, and foundries (-3.2% per year).

The growth in transportation and warehousing employment is mostly due to growth in transit (up 4.1% per year) as well as truck transportation (up 2.9% per year). Separate data on warehousing is not available for Metro Vancouver, but is available at the provincial level. In BC, warehousing and storage employment grew from about 2,900 jobs in 1989 to about 6,300 jobs in 2009, an average annual growth rate of 3.9%. As the primary distribution centre for the province, the vast majority of this employment is located in Metro Vancouver.

Employment is only one way to look at industrial trends and in many cases is not the best way. Warehousing, for example, is not a labour-intensive industry so significant development and increased economic activity could occur without a large increase in employment. Manufacturing receives a lot of attention, particularly in the US, due to declining employment over time[5], but total manufacturing production in the US remains near all-time highs. It is now being achieved with machinery and technological innovations that make each individual worker much more productive, but require relatively few workers compared to the past. Large scale manufacturing industries that are still labour-intensive will tend to locate in parts of the world where labour is less expensive.

[5] From 1990 to 2009, manufacturing employment declined by 1.6% per year in metro Seattle, 3.8% per year in metro Los Angeles and 2.9% per year in metro San Francisco.

BC-level data for employment and gross domestic product (GDP), which is a measure of value-added, demonstrates these trends over the last decade.[6] As shown in Table 5, from 1999 to 2009 provincial employment in manufacturing declined by 0.5% per year but GDP grew by 1.7% per year. Value-added per worker therefore increased by 2.2% per year. Employment grew in both wholesale trade and transportation/warehousing, but GDP grew faster. Indeed, this pattern is the source of improvements in standard of living – producing more with a given amount of input.

Table 5: Average Annual Growth Rates in BC Employment and GDP in Industrial Land-Intensive Sectors, 1999-2009*

	Manufacturing	Wholesale Trade	Transportation/ Warehousing	All Industries
Employment	-0.5%	2.1%	1.1%	**2.0%**
GDP	1.7%	3.1%	2.7%	**2.8%**
GDP per job	2.2%	1.1%	1.5%	**0.8%**

*Annual figures are 3-year moving averages that include the two prior years. This is done to smooth random variations in the labour force survey results.
Source: BC Stats

Looking to the future, BC Stats has prepared employment projections for the "Vancouver college region", which is somewhat larger than Metro Vancouver's boundaries. Urban Futures also prepared employment forecasts for the entire BC Southwest several years ago.

Regardless of the purpose and details of each forecast, they tell a similar story. Table 6 shows that employment growth in manufacturing will, at best, match the level of growth in overall employment and/or continue to fall (as in the US). Job growth in wholesale trade and transportation/warehousing will be higher as it is more closely related to population growth and growth in other sectors.

Table 6: Sample of Average Annual Employment Growth Projections in Industrial Land-Intensive Sectors

Projection Source	Manufacturing	Wholesale Trade	Transportation/ Warehousing	All Industries
BC Stats, for Vancouver College Region				
(2009-2014)	1.7%	2.7%	1.4%	**1.6%**
U.S. Department of Labor, for United States				
(2008-2018)	-0.9%	0.4%	0.9%	**1.0%**
Urban Futures, for Southwest BC				
(2005-2015)	1.8%	-	-	**2.4%**
(2015-2025)	0.6%	-	-	**1.4%**

Sources: BC Stats, U.S. Department of Labor, Urban Futures

Despite the slower rate of employment growth, the manufacturing, wholesale trade and transportation/warehousing sectors may continue to require more building space and

[6] GDP data is not available at the Metro Vancouver level so these calculations can be shown only for BC.

industrial land as production expands, independent of employment. The link between manufacturing production and building space requirements is not well understood and in any event varies tremendously for different types of manufacturing. Employment densities for a food manufacturing facility (such as a commercial bakery) are likely far higher than for a large metal fabrication shop.

Some of the individual manufacturing industries that have shown strong growth recently are likely to continue to grow. Food manufacturing has a large population-serving component, so as the regional population continues to increase (and as more food is produced locally), it will grow. Some manufacturing supports major project construction, such as fabricated metal manufacturing of large bridge pieces or concrete manufacturing for the same purpose. These sectors will be strong as long as major project construction continues in the province. Wood products manufacturing will likely stabilize as a much smaller industry than in the past – there will be very few large mills remaining, but given the quality of wood resources in BC, there will always be companies using that wood to produce high-value products.

Apart from manufacturing, industrial land demand in Metro Vancouver will continue to be driven in large degree by goods handling and distribution needs, particularly as Gateway projects are completed and goods movement through Port Metro Vancouver continues to increase. Container traffic shipped through Metro Vancouver more than doubled from 1999 to 2008, increasing from just over 9 million tonnes to 20.5 million tonnes (an average annual growth rate of 9.5%), before falling back to 19.3 million tonnes with the recession in 2009[7]. Growth in container traffic is associated with increased demand for warehousing and cross-docking facilities[8], the most efficient of which will employ relatively few workers compared to the volume of goods processed.

Economic impact analysis for Port Metro Vancouver suggests that more than half of industrial development in the region is related to transportation and goods handling[9], which will not likely be evident from employment figures.

2.3 Industrial Land Values and Lease Rates

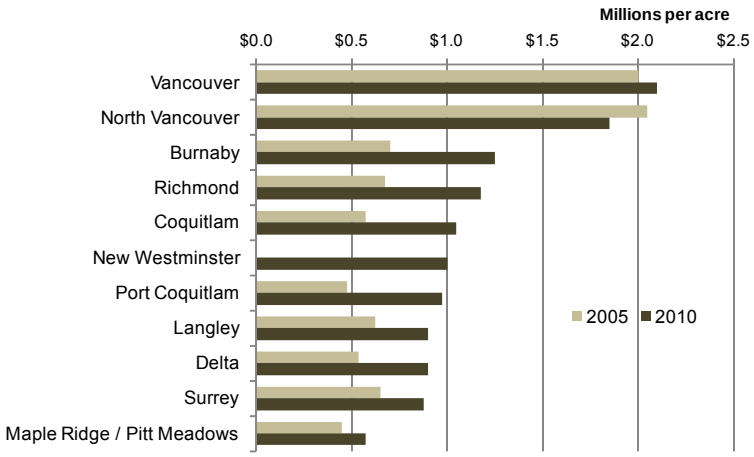
Detailed statistics on industrial land prices, building lease rates, and development activity are collected by several commercial real estate firms and reported for major sub-markets within Metro Vancouver. These reports are not comprehensive for every industrial property in the region and may not be collected in a consistent fashion every year.

Regardless, they are often the best source of readily-available data on the characteristics of different industrial areas in the region and trends over time. Larger international brokerages also report on market conditions across many metropolitan areas in North America, allowing comparisons of Metro Vancouver's competitive position.

[7] InterVISTAS Consulting Inc., *2008 Port Metro Vancouver Economic Impact Study*, prepared for Port Metro Vancouver, January 12, 2009.
[8] Cushman & Wakefield, *New Age of Trade: The Americas,* prepared for the NAIOP Research Foundation, January 2009.
[9] Reported in *Township of Langley Employment Lands Study*, April 2010, page 18.

Table 7 shows serviced developable industrial land values for various sub-markets in 2005 and 2010. Prices range from a low of roughly $500,000-$600,000 per acre in Maple Ridge/Pitt Meadows to more than $3.0 million per acre for some Vancouver parcels. The mid-point in the range for each area is shown in Chart 3.

Chart 3: Industrial Land Values per Acre
(mid-point of range)



Values in the suburban areas that are home to most of the typical industrial park space in the region range from $650,000-$700,000 for the least expensive areas in Surrey and Langley to $1.4 million for the most expensive areas of Richmond and Burnaby.

Land values have increased significantly in recent years, growing by 10-15% per year in Richmond, Burnaby, Delta, Coquitlam and Port Coquitlam. Growth rates have been lower in Surrey and Langley (6-8% growth per year) with little or no change in Vancouver and North Vancouver. The growth rate has not, however, been steady over the period, with some decline during the 2009 recession.

Table 7: Industrial Land Values (per acre), Metro Vancouver Sub-markets

	2005			2010			Avg. Annual
Sub-market	**Min**	**Max**	**Mid-point**	**Min**	**Max**	**Mid-point**	**Growth**
Vancouver	$1,000,000	$3,000,000	$2,000,000	$900,000	$3,300,000	$2,100,000	1%
North Vancouver	$1,900,000	$2,200,000	$2,050,000	$1,700,000	$2,000,000	$1,850,000	-2%
Burnaby	$600,000	$800,000	$700,000	$1,100,000	$1,400,000	$1,250,000	12%
Richmond	$550,000	$800,000	$675,000	$950,000	$1,400,000	$1,175,000	12%
Coquitlam	$500,000	$650,000	$575,000	$900,000	$1,200,000	$1,050,000	13%
New Westminster	n/a	n/a	n/a	$900,000	$1,100,000	$1,000,000	n/a
Port Coquitlam	$400,000	$550,000	$475,000	$850,000	$1,100,000	$975,000	15%
Langley	$400,000	$850,000	$625,000	$700,000	$1,100,000	$900,000	8%
Delta	$475,000	$600,000	$537,500	$800,000	$1,000,000	$900,000	11%
Surrey	$450,000	$850,000	$650,000	$650,000	$1,100,000	$875,000	6%
Maple Ridge / Pitt Meadows	$400,000	$500,000	$450,000	$500,000	$650,000	$575,000	5%

Source: Colliers International

Table 8 compares industrial land values in Metro Vancouver and competing western markets (plus Toronto and Montreal). It clearly shows that, with the exception of San Francisco, Metro Vancouver's land costs are substantially higher than most other markets.

It is unclear exactly how a single price for each market is calculated (especially since there is such variation within markets, as the previous table showed), but the general conclusion that Metro Vancouver's land values are markedly higher than competitors is likely true. This data

also makes clear why San Francisco has far less employment in the industrial land-intensive sectors discussed earlier in this chapter. It is simply not economical for most of them to locate there.

Table 8: Industrial Land Values, Various Metro Areas, December 2009

Metro Area	Industrial Land Price (per acre)
San Francisco Peninsula	US $3,000,000
Metro Vancouver	**C $1,100,000**
Los Angeles	US $650,000
Toronto	C $550,000
Edmonton	C $450,000
Montreal	C $450,000
Seattle/Puget Sound	US $400,000*
Calgary	C$400,000
Portland	US $250,000
Los Angeles - Inland Empire	US $150,000

*Seattle figure is from a 2010 mid-year survey.
Sources: Colliers International and Cushman & Wakefield of California

Industrial lease rates vary much less across the region than industrial land prices. Average lease rates currently range from just under $6 per square foot in Surrey and Maple Ridge/Pitt Meadows to upwards of $12 per square foot in Vancouver. The most expensive space is therefore just over twice as costly as the least expensive, whereas the most expensive industrial land can be four times as costly (or more) relative to the least expensive. A possible explanation for this discrepancy is that industrial space is more uniform across the region and competition will tend to equalize lease rates, whereas land values may be influenced by a wider variety of factors, including the belief that the land may ultimately be converted to higher-value uses, which cause a greater disparity in land prices.

Lease rates have increased across the region since 2000, but are currently down from their peak in 2008-2009 due to softer economic conditions. Lease rate data from Colliers suggests the greatest rate increases have been in the more-developed markets of Vancouver, Burnaby, Richmond and North Vancouver, whereas increases have been slower in Langley, Surrey and Delta.

Table 9: Industrial Lease Rates ($ per sq. ft.), Metro Vancouver Sub-markets

	2000 (year-end report)*			2010 (3rd quarter	Average Annual
Sub-market	Min	Max	Mid-point	report)**	Growth
Vancouver	$6.00	$8.50	$7.25	$12.75	6%
North Vancouver	$5.00	$8.00	$6.50	$9.52	4%
Burnaby	$5.50	$6.00	$5.75	$8.33	4%
Richmond	$5.25	$7.00	$6.13	$8.15	3%
Coquitlam	$5.25	$6.75	$6.00	$7.73	3%
New Westminster	$4.70	$6.75	$5.73	$7.15	2%
Port Coquitlam	$4.50	$6.00	$5.25	$7.15	3%
Langley	$4.75	$6.50	$5.63	$6.92	2%
Delta	$5.50	$6.00	$5.75	$6.84	2%
Surrey	$4.75	$5.75	$5.25	$5.94	1%
Maple Ridge / Pitt Meadows	$4.75	$5.50	$5.13	$5.94	2%

* 2000 data is for "mid bay" industrial space, defined as 15,000-40,000 square feet in size. Lease rates were also provided for "small bay", which had the same or somewhat higher rates, and larger bulk warehouses, which had somewhat lower rates.
** 2010 data is a single average lease rate for all industrial property.
Source: Colliers International

An international survey by Colliers International shows industrial lease rates in Metro Vancouver are comparable to other western markets (although it is unclear on exactly what basis the regional average rate of $6.50 per sq. ft. is determined as that rate appears lower than many of the individual sub-markets within the region). San Francisco is the only market that has significantly higher lease rates, while Portland is consistently lower. The combination of similar lease rates with higher land prices means the capitalization rate for Metro Vancouver industrial properties is lower (this is a measure of the financial return on owning industrial land and is calculated simply as the net annual income from a property divided by the purchase price).

Table 10: Lease Rates for "Prime Warehouse", Various Metro Areas, First Half 2010

Metro Area	Warehouse Lease Rates ($/sq. ft.)
San Francisco Peninsula	US $9.60
Seattle/Puget Sound	US $7.18
Edmonton	C $7.00
Calgary	C $6.75
Metro Vancouver	**C $6.50**
Los Angeles	US $5.85
Portland	US $5.28
Toronto	C $5.13
Montreal	C $4.00

Source: Colliers International

With respect to other operating costs, including taxes, a comparison of manufacturing facilities using the KPMG Competitive Alternatives database shows Vancouver with the lowest combined labour, facilities, transportation and utilities costs among the comparison

cities in this report (except for Calgary, which is not in the Competitive Alternatives database)[10]. Property taxes are lower than all of the cities except Edmonton.

2.4 Industrial Land Inventory

The total inventory of industrial building space in Metro Vancouver has grown by an average of about 3.5 million square feet per year for the last decade (Table 11). The most new space has been developed in Richmond, Surrey, Langley and Burnaby, while Vancouver has seen relatively little growth. In percentage terms, the growth rates in Coquitlam, Port Coquitlam and Maple Ridge/Pitt Meadows have all exceeded the regional average, but from a lower starting point.

Chart 4: Industrial Space Inventory, 2000-2010

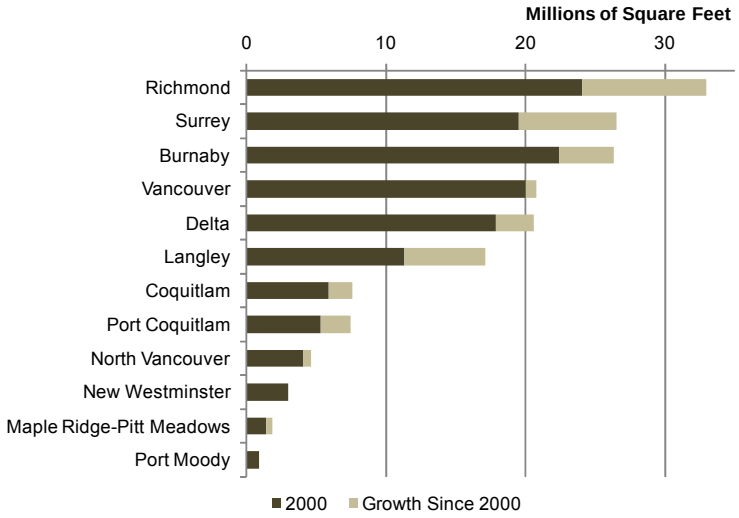


Table 11: Industrial Space Inventory (square feet), Metro Vancouver Sub-markets

Sub-market	2000 (year-end)	2010 (Q3)	Change	Average Annual Change	Average Annual Growth Rate
Richmond	24,049,800	32,946,884	8,897,084	915,000	3.3%
Surrey	19,490,981	26,543,676	7,052,695	725,000	3.2%
Burnaby	22,419,170	26,342,885	3,923,715	400,000	1.7%
Vancouver	20,004,625	20,798,246	793,621	80,000	0.4%
Delta	17,866,560	20,563,857	2,697,297	275,000	1.5%
Langley	11,300,700	17,146,379	5,845,679	600,000	4.4%
Coquitlam	5,882,100	7,592,575	1,710,475	175,000	2.7%
Port Coquitlam	5,279,800	7,482,408	2,202,608	225,000	3.6%
North Vancouver	4,032,900	4,636,146	603,246	60,000	1.4%
New Westminster	2,989,400	2,989,400	No change	No change	0.0%
Maple Ridge-Pitt Meadows	1,370,950	1,810,984	440,034	45,000	2.9%
Port Moody	897,300	897,300	No change	No change	0.0%
Total	**135,584,286**	**169,750,740**	**34,166,454**	**3,500,000**	**2.3%**

Source: Colliers International. Note that, in the case of New Westminster, it is possible that there may have been some change in the industrial building space square footage between 2000 and 2010 that has not been picked up by the Colliers International inventory.

The average annual growth rate of 2.3% from 2000 to 2010 is substantially higher than regional employment growth in the industrial land-intensive sectors of manufacturing,

[10] Competitive Alternatives website (www.competitivealternatives.com). Detailed cost comparison report for the manufacturing average for Vancouver, Edmonton, Seattle, Portland, San Francisco and Los Angeles.

wholesale trade and transportation/warehousing, which have averaged only 0.7% per year over this time-frame. This may suggest that the type of industrial space being developed in recent years has a lower employment density than pre-existing industrial space, which would be consistent with the recent emphasis on lower-employment warehousing space.

Note that each of the major commercial brokerages maintains its own database of industrial properties, which vary slightly. Colliers International was used for this analysis in order to more easily compare to their statistics from 2000.

2.5 Building Construction Costs

Building construction costs obviously vary depending on building design and use. For the typical warehouse in the region, with 10% - 20% office space, the average construction cost is currently in the range of $75 - $85 per sq. ft.[11] But, the cost can be as low as about $60 per sq. ft., especially if there is less office space (which costs more per sq. ft. than basic warehouse space). Conversely, the cost is more per sq. ft. where the building is two or more storeys.

Since standard building construction costs do not, in most cases, vary significantly across the region (excluding site specific factors such as geotechnical conditions), they are not a significant factor in the difference in the intensity of industrial land use between industrial areas.

The noted exception to industrial building costs being similar across the region is where municipalities require standards beyond the BC Building Code for items such as green roofs. The additional cost per sq. ft. of building area depends on the nature of the enhancement and the specific size and use of the building. However, regardless of the exact additional cost, there is no evidence that it materially affects the intensity of development.

2.6 Tenure

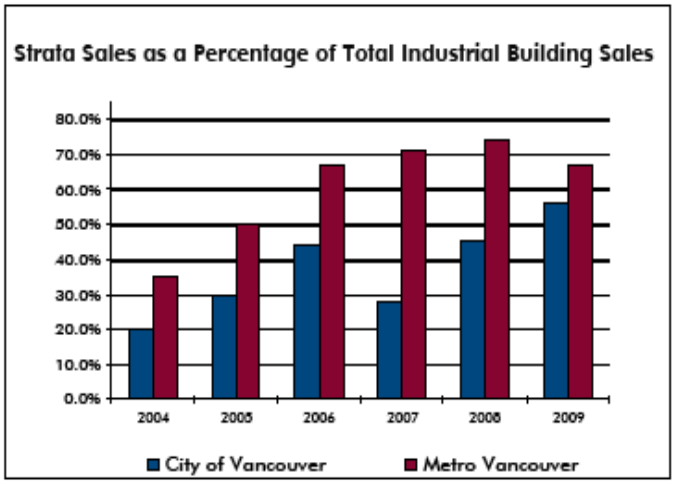
The trend in Metro Vancouver is towards ownership (strata and fee simple) of industrial buildings as opposed to leasing. Strata sales as a percentage of total industrial building sales in Metro Vancouver have roughly doubled over the past six years and now account for the majority of sales (Chart 5).

Low interest rates are the primary driver of this trend, coupled with a desire by more business owners to have better control over their operating costs. The likelihood that industrial properties will continue to increase in value in Metro Vancouver and are therefore a good investment is another consideration.

The strata trend is also a reflection of the growing number of small niche industrial businesses in the region, which do not require a large amount of space. Strata units as small as 2,500 sq. ft. can be purchased in some developments, although most start in the 5,000 - 10,000 sq. ft. range.

[11] Butterfield Development Consultants Ltd. website.

Chart 5: Strata Industrial Building Sales Trend[12]



Most industry analysts expect the demand for strata ownership units to remain strong over the long-term. There is no indication that the form of tenure affects the intensity of industrial land use.

2.7 Employment Densities

Employment densities are calculated as the number of jobs per unit of building floorspace. They can vary significantly between different industries and land uses, with an office building, for example, often having far more jobs than a similarly-sized industrial building that may need space for large machinery, moving and storing goods, etc.

Several of the more comprehensive studies of this topic in Metro Vancouver are summarized in Table 12, as well as studies from the Seattle and Portland regions. Clearly industrial densities are much lower (i.e., more floorspace per job) compared to retail and office uses. Within the industrial category, warehouses have much lower densities than manufacturing and other industrial businesses.

Table 12: Sample of Employment Densities (square feet of floorspace per job)

Study / Region	Retail	Office / Business Park	Industrial (All)	Industrial - General/ Manufacturing	Industrial- Warehouse
Royal LePage (2003) / Metro Vancouver					
- 2001 estimates	392	210	542		
- 2021 projections	422	189	635		
City of Vancouver (2006)/ Vancouver Metro Core					
- 2031 projections	340-375	290-420	425-600		
Urban Futures (2008) / Fraser Mills site in Coquitlam - future buildout	280-390	475-575	900-1,800		
Site Economics (2010 / Langley					
- 2006 estimate	575	200	1,000	400 (flex space)	1,000
- 2021 projections	575	200	950	400 (flex space)	1,000
Cushman & Wakefield LePage (2008) / Surrey					
- 2006 estimates	500	265	650		
- 2031 projections	450	239	585		

[12] The source for the chart is CB Richard Ellis and the Beedie Group. It is industry-wide data.

Study / Region	Retail	Office / Business Park	Industrial (All)	Industrial - General/ Manufacturing	Industrial-Warehouse
Harris Consulting (2006) / Richmond	325	125-275		450 (manufacturing)	750
Portland Metro (1999) / Portland region	470	370		300-1,600	1,400-3,300
Erin Pflum (MA thesis, 2004) / Puget Sound	500-625	300-325		700-1,050	1,075-1,350

Conclusions from the research into employment densities include:

- Some studies assume modest increases in industrial employment density over time (i.e., less floorspace per job), but generally very little as it is assumed that most businesses are already organized to optimize their use of space. Other studies assume that as the mix of industrial uses in the region evolves to contain more warehousing, the average industrial employment density will fall (because warehousing usually has significantly lower densities than other industrial uses). Without radical changes in technology or massive increases in the relative prices of non-labour industrial inputs (land, building construction, equipment, etc.) it is unlikely that the current form of most industrial uses will yield significantly more jobs.

- Continued improvements in technology may not favour increased employment. As discussed earlier, more intensified use of industrial land may result in fewer jobs if human labour is replaced by more efficient machinery.

- The decreases in employment density in retail and industrial that were forecast by Royal LePage are due to a changing mix of business types within each category. These include the forecast trend toward larger-format retail outlets, which have a much lower employment density (more space per worker) than smaller stores, as well as the increasing prevalence of low-employment intensity warehouses as part of the region's industrial mix.

- Although the data is limited, average industrial employment densities in Metro Vancouver appear to be higher than the neighbouring Seattle and Portland metro areas.

- Employment densities relative to building floorspace are believed to vary little between urban and suburban locations. Urban locations usually have a higher development density so there are more jobs per unit of land, but not more jobs relative to building floorspace. While this may seem counter-intuitive (because higher rents should lead to more employees in a given building size), it appears that how densely employees are packed in a building is determined more by technology and the nature of the business. None of the reports from Metro Vancouver or other regions makes a distinction between higher-cost urban settings and lower-cost suburban settings in reporting employment densities.

In terms of industrial land intensification in Metro Vancouver, these conclusions suggest that the rate at which industrial employment grows is likely to be at a slower pace than the increase in industrial floorspace. The one caveat, however, is that not all industrial activity

takes place within buildings – a significant share is outdoors – so floorspace should not be relied upon as the sole indicator of industrial employment growth.

2.8 Summary

The economy of Metro Vancouver is very diverse – there are no dominant industries that drive the regional economy. While the region's industrial structure is generally similar to other western North American markets, it is by some measures the most diverse even within this group.

The industry sectors that are most concentrated on industrial land in Metro Vancouver are manufacturing, wholesale trade and transportation/warehousing. The region's major industrial areas are also home to some employment in nearly every other sector, while manufacturing, wholesale and transportation/warehousing jobs are also located in non-industrial areas.

Measured by employment, these industrial land-intensive sectors are growing more slowly than the regional economy overall. They are consequently making up a smaller percentage of total employment over time. Employment is often not the best indicator of the demand for industrial land, however, as many types of industrial operations increasingly require less labour to achieve the same or higher levels of output and value-added.

The volume of cargo shipped by container through Metro Vancouver has more than doubled in the last 10 years and this is the cargo type most associated with increased demand for warehousing and transhipment facilities. Most of the largest and most efficient of these facilities are highly automated and require relatively little labour relative to the volume of economic activity occurring onsite. Industrial floorspace data supports this trend as the inventory of floorspace has increased about three times faster than employment in the main industry-related sectors over the last decade.

On a competitive basis, Metro Vancouver's land prices are high compared to most competing regions in western North America (only San Francisco is higher), while lease rates for warehousing space are generally similar. This suggests that the region will continue to face direct competition from other markets for many industrial and transportation/warehousing activities.

With respect to intensification, the average industrial employment densities in the region (sq. ft. of leasable floorspace per job) appear higher than the competing markets of Seattle and Portland (although the data is limited). The growth of lower-employing warehousing functions may limit the potential to significantly increase the employment density of industrial land in the near future.

Building densities per unit of industrial land are also unlikely to increase significantly due to the constraints of technology (most industrial operations cannot efficiently operate on more than one floor) and the need for outdoor space for truck and goods movement.

3. Industrial Development in Other Metropolitan Areas

Six other metropolitan areas in western Canada and on the US west coast were examined to learn how they are managing their industrial lands and if they are employing strategies to intensify use that can be applied in Metro Vancouver. The selected areas are Calgary, Edmonton, Seattle, Portland, San Francisco and Los Angeles. They were chosen because of their size, geographical proximity to Metro Vancouver and/or similarities in industrial activity.

For each area, information was sought on the industrial zones most used and the key density-related provisions, especially FARs. Details on items such as building setbacks, while having an influence on density, are beyond the scope of this analysis. There are a range of complexities on how setbacks are calculated and applied in the zones in each jurisdiction, with little commonality.

3.1 Calgary

Most of the industrial development in the City of Calgary is found in the General Industrial (I-G) zone, which allows a wide range of light and medium industrial uses. The main distinction between the two uses is that light industrial activity has to be enclosed while medium industrial activity does not. Office uses are permitted as long as they do not exceed 50% of the total floor area. They do not have to be accessory to the industrial use on the site.

The maximum allowable FAR in the I-G zone is 1.0. The maximum building height is 52.5 ft.

Calgary has large tracts of industrial land available for development or redevelopment and prices have been in decline. As a result, there is little pressure on most ndustrial businesses to intensify their uses. Nevertheless, the City wants to encourage more intense use.

Calgary approved a new *Municipal Development Plan* (MDP) that became effective in April 2010. Among other things, the plan discourages stand-alone office uses and regional-serving retail developments in standard industrial areas (defined as established industrial areas where the types of uses are not expected to significantly change).

The MDP also establishes two other types of industrial areas:

- Industrial-Employee Intensive, which is intended for manufacturing, warehousing and mixed industrial/office developments that have high labour concentrations and require access to the City's primary transit network. They can be in the form of business parks in newly developing areas or as part of redevelopment and intensification of certain standard industrial areas. The target is for a minimum of 40 jobs per gross developable acre. The City is currently working on strategies and plans for how this intensification target will be achieved, which is a challenge given an abundant supply of industrial land that tends to induce dispersed development rather than concentration.

- Greenfield Industrial, which is future industrial areas on the edge of Calgary intended for a broad range of standard industrial uses and industry-related commercial functions. In some cases, this could include Industrial-Employee Intensive uses. However, no employment density target has been set and further details on Greenfield Industrial areas will be established by the City though an Area Structure Plan.

3.2 Edmonton

The City of Edmonton is in the process of updating its *Industrial Land Strategy*, which was adopted by Council in 2002. The strategy recognized the importance of an appropriate supply of industrial land to the Edmonton economy, but since then there has been continued conversion of industrial land in some areas of the city to commercial and residential uses. Some industrial development, particularly heavier uses, has been drawn away from Edmonton to the adjacent County of Strathcona, which offers large parcels of land at relatively low prices.

Edmonton has four industrial zones, one of which – the Industrial Business (IB) zone – allows significant commercial uses and functions more like what the draft Metro Vancouver RGS would define as a "Mixed Employment" area.

The dominant industrial zone has historically been Medium Industrial (IM), which allows manufacturing, processing, assembly, distribution, service and repair uses that carry out a portion of their operation outdoors or require outdoor storage areas. The maximum FAR is 2.0 and the maximum building height is 59 feet. There is no restriction on site coverage except as controlled by building setbacks.

The City has a newer Light Industrial (IL) zone that is starting to be used more. One of the conditions of use is that no outdoor storage is permitted. It does not allow as many commercial uses as the IB zone, but it does allow certain types of non-accessory office uses, such as business services, professionals and contractors. The maximum FAR is 1.2, except it can be up to 1.6 where underground parking is provided, but no developer has taken advantage of this bonus density so far. The maximum building height varies between 46 and 59 feet, depending on use. There is no restriction on site coverage except as controlled by building setbacks.

According to City of Edmonton staff, most industrial properties do not exceed a density in the 0.4 – 0.5 FAR range, and many are lower. This is not expected to change in the foreseeable future.

3.3 Seattle

The City of Seattle has two zones in which the majority of its industry is located:

- General Industrial 1 (IG1) protects marine and rail related industrial areas from an inappropriate level of unrelated retail or commercial uses by limiting these uses to a density or size lower than that allowed for industrial uses. The maximum FAR is 2.5, of which no more than 1.0 FAR may be used for retail uses, to a maximum of 30,000 sq. ft., and/or for office uses, to a maximum of 50,000 sq. ft. There is no cap on the maximum permitted building height.

- General Industrial 2 (IG2) allows a broad range of uses where the industrial function of an area is less established than in the IG1 zone and where additional commercial activity could improve employment opportunities and the physical condition of the area. The maximum FAR is 2.5, of which a maximum of 75,000 sq. ft. may be used for retail uses and a maximum of 100,000 sq. ft. may be used for office uses. There is no cap on the maximum permitted building height.

While these two zones are considered by Seattle to be industrial, they would be considered "Mixed Employment" based on the draft Metro Vancouver RGS definition because of the amount of office and retail permitted, neither of which have to be accessory to an industrial use.

Seattle Planning and Development staff have not observed much intensification of uses in the two zones despite the high maximum permitted FAR. Most of the sites in the two zones are relatively low intensity use, with older one storey buildings the dominant form of development. There is not sufficient economic impetus to encourage redevelopment because vacancy rates are low and property owners are achieving reasonable rents. This has made it difficult for those developers who have been interested in redevelopment to assemble sufficient properties to make their projects viable.

3.4 Portland

The City of Portland established an Industrial Sanctuary in its Comprehensive Plan in 1980. The purpose of the sanctuary, which contains about 14,000 acres of industrial land, is to protect Portland's industrial land base and ensure that the primary uses on the land are industrial. Commercial uses, for example, are limited to a maximum of 3,000 sq. ft. of floorspace per site, regardless of the size of the lot. As a result, City staff estimate that only about 5% of industrial land is being used for non-industrial purposes.

There are three zones applied within the Industrial Sanctuary:

- General Industrial 1 (GI 1), which is applied in the City's older industrial areas that generally have smaller lots, a grid block pattern and buildings with higher lot coverage that are close to the street. The maximum permitted site coverage is 100%.

- General Industrial 2 (GI 2), which is applied in areas that generally have larger and more irregularly shaped lots and buildings with low to medium lot coverage that are usually set back from the street. The maximum permitted site coverage is 85%.

- Heavy Industrial (IH), which provides areas where all types of industry may locate, including those not desirable in other zones because of objectionable impacts or appearance. The maximum permitted site coverage is 100%.

There is no maximum limit on the FAR or building heights in any of the three zones.

Average industrial densities are low. According to Portland Bureau of Planning and Sustainability staff, the average FAR for industry in the city is about 0.25 – 0.3 and around the same in the surrounding county. The highest densities are about 0.5 FAR.

The primary reason for the low densities is an abundant supply of industrial land. The county's urban growth boundary was expanded several years ago to bring in approximately 4,000 more acres of land for industrial use. Land prices are relatively low as a result and many industrial businesses are selecting large acreage sites that give them buffers from neighbouring uses and room to expand in the future if needed.

The City has, however, observed two trends where some businesses are finding ways to intensify without physical expansion. The first trend is increased productivity by applying

improved technologies and processes. The second trend is expanding hours of operation by adding shifts.

Another trend has been towards larger industrial buildings. A 2007 article on industrial development trends in the Pacific Northwest noted that the size of newer warehouses increased from an average of 120,000 sq. ft. in 2002 to 216,000 sq. ft. in 2006.[13] As a result, average industrial property sizes also increased. The article's author identified over 11,000,000 sq. ft. of recently established distribution centre space along the I-5 corridor, with most of the facilities on sites larger than 50 acres.

The same article also noted a growing preference by industrial businesses to own rather than lease space due to low interest rates.

3.5 San Francisco

The City of San Francisco has two zones that it traditionally applied to much of its industrial land:

- Light Industry (M-1), which is intended for smaller industries dependent on truck transportation. Most types of industry are permitted in this zone. The maximum FAR is 5.0.

- Heavy Industry (M-2), which is the least restrictive in uses and located at the eastern end of the city away from residential and commercial areas. This is where many of the larger industries served by rail and water transportation, as well as utilities, are found. The maximum FAR is 5.0.

Both of these zones until recently also allowed residential as a use under certain conditions.

Many of the industrial uses that once occupied these two zones have moved out of San Francisco to cheaper land elsewhere or have shut down altogether. In response, the City has changed much of its M-1 zoned land to allow mixed use development. It has also tightened up on the permitted uses in its industrial areas to exclude residential. This includes live-work uses, which the City found were becoming "live" without the "work".

The City is now focussed on encouraging what it coined as Production, Distribution and Repair (PDR) functions on some of its industrial land to help support the San Francisco tourism industry and downtown business and residential core. Examples of PDR activities include:

Production	**Distribution**	**Repair**
- Printing and publishing	- Transportation and delivery	- Appliances
- Catering and food processing	- Warehousing	- Motor vehicles
- Furniture manufacturing	- Wholesaling	- Construction contractors

[13] Portland State University Centre for Real Estate, *Quarterly - Industrial Development Trends*, prepared by Roger Qualman, Partner, Norris Beggs & Simpson, Third Quarter, 2007, p. 31.

These functions have been targeted because they provide above-average wages for their employees and provide goods and services that the city needs on a daily basis. Many are smaller businesses. They are especially suited to older industrial buildings because they need low rents and flexible space to be economically viable within a city where land costs are among the highest in North America.

Because PDR uses are occupying predominantly converted industrial buildings, the intensity of use (at least as measured by FAR) depends on what was there before. Some are in multi-storey buildings, but most are in one storey buildings that are well below the maximum permitted density of 5.0 FAR that has carried over from the old M-1 zone provisions.

3.6 Los Angeles

The City of Los Angeles has about 19,000 acres of land zoned for industrial use, excluding the Los Angeles Airport (3,500 acres) and Port of Los Angeles (7,500 acres).

The City's General Plan Framework states it must "actively ensure that the City has sufficient quantities of land suitable to accommodate existing, new and relocating industrial firms." It also limits the conversion of existing industrial land to other land uses to avoid creating "a fragmented pattern of development [that] reduces the integrity and viability of existing industrial areas."

Despite this policy framework, a 2007 study by the City outlined a number of challenges facing the future of its industrial land.[14] The study found that 26% of Los Angeles' industrially zoned land is already in use for non-industrial purposes and that more would be lost without a concerted effort to halt the trend. The trend is partly due to the permissive nature of most of the City's five manufacturing (i.e., industrial) zones, which in some cases allow non-industrial activities such as institutional, service stations and garages, and retail as outright uses. There has also been conversion of industrial land to residential use.

According to City staff, the maximum permitted FAR in most of Los Angeles' industrial areas is between 0.5 to 1.0, depending on the zone, but the densities of most developments are well below the permitted maximum.

The City's Planning Department has been working on plans for how to preserve and intensify the use of its industrial land since completion of the 2007 study, but these plans are at an early stage. One of the issues is that existing industrial businesses and developers have shown little interest in intensification, especially in the current economic climate. This is making it more difficult to move forward.

Los Angeles is moving at a faster pace with strategies to attract "green" industries because this is a growth sector of the economy that offers quality jobs. One of the outcomes may be more intense use of some industrial sites because these businesses often have an office component with research and development, administration and related functions that can be accommodated in multi-storey buildings. Generally, however, the City does not anticipate a major change in how intensively most of its industrial lands are used in the foreseeable future.

[14] City of Los Angeles Department of City Planning and the Los Angeles Community Redevelopment Department, *Los Angeles' Industrial Land Sustaining a Dynamic City Economy,* December 2007.

3.7 Summary

All of the metropolitan areas examined are interested in ensuring that efficient use is made of their industrial land. But, each jurisdiction has a different view of what "intense" means and also of the uses that are appropriate for industrial areas.

Industrial development averages around 0.3 FAR in most areas and rarely exceeds 0.5 FAR, with uses in one-storey buildings or one-storey buildings with mezzanine configurations. Moreover, average industrial densities do not appear to be significantly increasing in most areas. In a recent study of job growth and employment land demand in San Jose, California, the City assumed that the average FAR for industrial and warehousing uses will remain at 0.3 over the next 30 years.[15] In contrast, it projects that the average densities for all other types of land uses in the city will increase.

The constraint to intensification is rarely due to the density provisions in zoning regulations. The densities being achieved are a function of land values, which are in turn a function of supply and demand. Where there are opportunities for industry to disperse or relocate elsewhere rather than to intensify, that is often the route chosen. For many businesses, it is not really even a choice because of the nature of what they do, especially those that have outdoor storage needs, can only operate efficiently in a single level building and/or have to accommodate multiple tractor-trailer units at once.

Examples of somewhat higher densities can be found in the core areas of Portland, Seattle and San Francisco, where there are multi-storey buildings from an era when industry functioned in a different way and the infrastructure was not in place to accommodate dispersed development. However, where there are higher densities, they are often because non-accessory retail and office uses are permitted on at least a limited basis.

So, in terms of "Best Practices" for industrial land intensification, none of the jurisdictions examined can be considered to be the model that Metro Vancouver should emulate. In many regards, this region is already ahead of the other metropolitan areas examined in terms of how intensely it is using its industrial land overall, as discussed in the next chapter.

[15] City of San Jose Planning Division, *Envision San Jose 2040 - Job Growth Projections and Employment Land Demand*, March 18, 2009, p. 16.

4. Metro Vancouver Industrial Development Profiles

No two industrial developments are exactly alike. Each development is site specific and influenced by a range of factors - some significant and others more subtle. However, there are similarities among much of the recent industrial developments in Metro Vancouver. There are also a few exceptions, most of which are within the City of Vancouver's central area.

This chapter examines a selection of recent industrial developments around the region. Some are greenfield developments and others are in areas undergoing a second or third round of industrial use. The objective is to understand how intensely these developments are using the land on which they are located, as well as any differences based on location, and the reasons for this.

Seven industrial areas were selected for analysis (Map 2). Four are among the largest greenfield and/or brownfield development areas in the region, including Campbell Heights in Surrey, Tilbury in Delta, Big Bend in Burnaby, and Gloucester in Langley Township.

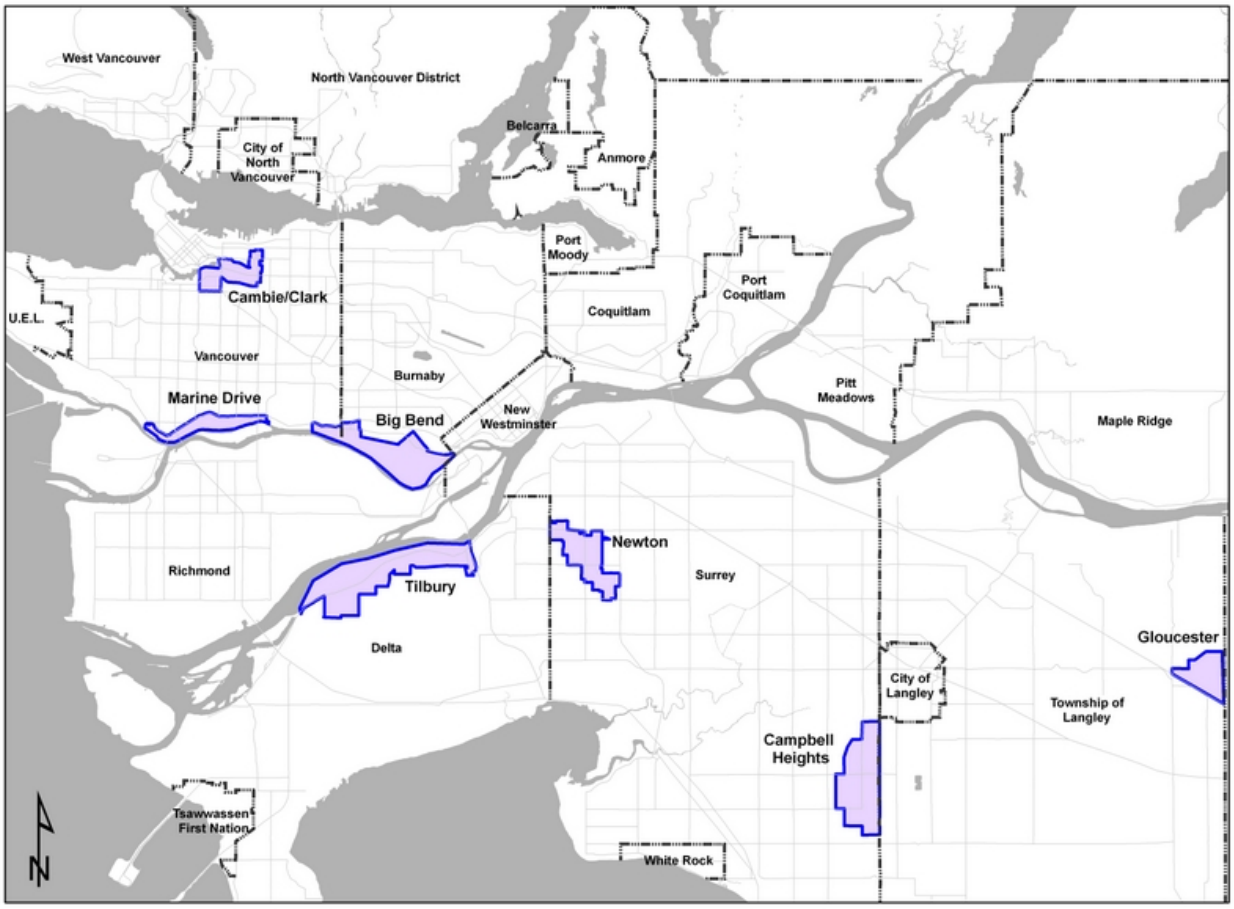
The three other selected areas - Marine Drive in Vancouver, Cambie/Clark in Vancouver and Newton in Surrey - have been in industrial use for many decades and are undergoing gradual redevelopment.

There are other industrial areas that could also have been examined, but the selected areas represent an interesting cross-section and are among the best known in the region.

For each of these areas, specific developments were identified that appear representative (based on fieldwork and other sources) of types and intensity of use. Some of the developments are profiled in additional detail where information was available to do so.

Information sources included Metro Vancouver's industrial land inventory database (which includes municipal and BC Assessment Authority data), municipal zoning bylaws, development and building plans (developer and real estate broker supplied), municipal planners, and field observations.

Map 2: Metro Vancouver Major Industrial Study Areas[16]



Source: Metro Vancouver

Employment data from the 2006 Census is available for six of the areas, as shown in Table 13. Included are jobs in the major industrial land-intensive sectors, as well as retail trade and office-related services. Note that the industrial areas examined for this report are just a small sub-area of the multi-use Marine Drive and Cambie/Clark areas.

Table 13: Employment with Usual Place of Work in Selected Industrial Areas, 2006

Sector	Campbell Heights	Tilbury	Big Bend	Gloucester	Marine Drive	Cambie / Clark	Metro Vancouver Total
Manufacturing	110 (24%)	4,890 (51%)	2,385 (33%)	1,815 (54%)	2,650 (27%)	3,950 (18%)	91,790 (9%)
Wholesale Trade	0 (0%)	1,675 (18%)	1,290 (18%)	580 (17%)	1,645 (17%)	2,855 (13%)	55,810 (6%)
Transportation & Warehousing	45 (10%)	900 (9%)	450 (6%)	305 (9%)	565 (6%)	1,550 (7%)	49,770 (5%)
Construction	150 (32%)	365 (4%)	560 (8%)	85 (3%)	470 (5%)	645 (3%)	31,290 (3%)

[16] Note that this map includes Newton as an industrial area, which was not one of Metro Vancouver's original 18 industrial areas for which it collected employment data (Map 1).

Sector	Campbell Heights	Tilbury	Big Bend	Gloucester	Marine Drive	Cambie / Clark	Metro Vancouver Total
Retail Trade	15 (3%)	230 (2%)	300 (4%)	60 (2%)	1,690 (17%)	1,810 (8%)	113,620 (12%)
Office-related Services*	65 (14%)	870 (9%)	1,790 (25%)	110 (3%)	1,175 (12%)	7,045 (31%)	246,020 (25%)
Other	80 (17%)	570 (6%)	515 (7%)	385 (12%)	1,630 (17%)	4,555 (20%)	389,315 (40%)
Total	**465 (100%)**	**9,500 (100%)**	**7,290 (100%)**	**3,340 (100%)**	**9,825 (100%)**	**22,410 (100%)**	**977,615 (100%)**

* The sectors referred to as "Office-related Services" include: information and cultural industries; finance and insurance; real estate and rental and leasing; professional, scientific and technical services; management of companies and enterprises; and administrative and support, waste management and remediation services.
Source: Statistics Canada Census

4.1 Campbell Heights, Surrey

The Campbell Heights area in south Surrey is designated as "Mixed Employment" in the draft Metro Vancouver RGS. However, it contains a number of developments that fit the Metro Vancouver RGS definition of "Industrial" and it is attracting a significant share of new industrial development in the region. Two of the zones being applied in the area are:

- The Industrial Business One (IB1) zone, which permits industrial business parks with a high standard of design consisting of light impact industrial uses, high technology industry, industry with a significant amount of research and development activity, warehouse, limited offices (professional office uses are excluded) and service uses carried out in enclosed buildings.

- The Industrial Business Two (IB2) zone, which permits the development of light impact industry, limited office and service uses with a high standard of design that are generally compatible with one another and with adjoining zones.

"Light impact industry" allows nearly all types of industrial uses, the key condition being that they are enclosed in a building. It also allows a limited range of non-accessory offices uses, such as architects, engineers and general contractors.

In both these zones, the maximum FAR is up to 1.0 (in exchange for contributions towards specified community amenities), the maximum site coverage is 60% and the maximum building height is 45 feet.

The maximum permitted site coverage in the IB1 zone was formerly 45%. Based on input from developers, who felt that the site coverage was too restrictive, the City of Surrey recently amended the zone to allow maximum site coverage of 60%.

The developments in Table 14 show the typical range of FARs in Campbell Heights.

Table 14: Campbell Heights Industrial Developments

Address	Use	Site Area (acres)	Building Area (sq. ft.)	FAR Built	FAR Permitted
19295 26th Ave	Storage & Warehousing	4.52	88,845	0.45	1.0
19082 21st Ave	Storage & Warehousing	6.52	116,603	0.41	1.0
2455 192nd St - Profiled below	Multi-tenant	6.25	148,146	0.55	1.0

Profile of 2455 192nd Street, Surrey (Table 15)

This 6.25-acre development, which is located on a corner lot at the intersection of 192nd Street and 24th Ave in Campbell Heights, is anticipated for completion by the Beedie Group in March 2011. It has nine strata bays, each of which can accommodate a small mezzanine level if desired by the occupant.

At the time of zoning, the maximum permitted site coverage in the Industrial Business One (IB1) zone was 45% and a variance was required in order for the building's site coverage to be 48.9%. This is one of the densest developments in Campbell Heights in terms of FAR.

Table 15: *2455 192nd Street, Surrey*

	Built	IB1 Zone Provisions
Total Gross Floorspace - Ground Floor - Mezzanine	148,146 sq. ft. - 133,131 sq. ft. - 15,015 sq. ft. (potential)	272,604 sq. ft.
FAR	0.55	1.0
Site Coverage	48.9 %	60%
Height	37.2 ft.	45 ft.
Parking	1 stall / 1,033 sq. ft. 144 total	1 stall / 1,075 sq. ft. 139 total

4.2 Newton, Surrey

The Newton area of Surrey contains many well established light, medium and heavy industrial businesses, a number of which have outdoor storage.

Commercial rather than industrial uses have evolved in the vicinity of 128th Street and 80th - 84th Avenue, mostly because of the Industrial Business Park (IB) zone. This zone is intended primarily for light impact industrial uses, but it also permits many types of office and service uses and these have become the dominant uses in this sub-area. The City of Surrey is undertaking a planning review of the area and it is likely to change land use designations. However, the remainder of the Newton industrial area will remain in industrial use, which is its designation in the draft Metro Vancouver RGS.

The two zones most broadly applied in the Newton industrial area are:

- The Light Impact Industrial (IL) zone, which allows light impact industry, transportation industry, warehouses, distribution centres and limited office and service uses. The maximum FAR is 1.0 (in exchange for contributions towards specified community amenities), the maximum site coverage is 60% and the maximum building height is 60 feet.

- The High Impact Industrial (IH) zone, which allows many types of heavy industry, as well as light industry. The maximum FAR is 1.0, the maximum site coverage is 60% and the maximum building height is 60 feet.

Because both of these zones allow outdoor storage, the average intensity of use in the area tends to be somewhat lower as measured by FAR or building site coverage. This applies to both older developments and some newer ones.

Where the uses are enclosed, the form of development is similar to that in other areas of the region.

The developments in Table 16 show typical FARs in Newton.

Table 16: Newton Industrial Developments

Address	Use	Site Area (acres)	Building Area (sq. ft.)	FAR Built	FAR Permitted
12140 86th Ave	Storage & Warehousing	3.92	55,608	0.33	1.0
12372 84th Ave	Storage & Warehousing	0.92	18,516	0.46	1.0
8371 84th Ave	Storage & Warehousing	1.78	25,026	0.32	Unknown (CD Zone)
8250 82A Ave	Storage & Warehousing	5.85	94,441	0.37	1.0
13120 78A Ave	Storage & Warehousing	2.08	50,244	0.55	1.0

4.3 Tilbury, Delta

The Tilbury industrial area in Delta contains a wide range of industrial uses, including major heavy industries that rely, at least in part, on marine transport. The entire area is designated as “Industrial” in the draft Metro Vancouver RGS.

Both greenfield and brownfield development is occurring in Tilbury, which has sites that have been utilized for decades for outdoor storage and other low intensity activities. There has been heightened market interest and development in the area, driven in part by the South Fraser Perimeter Road, which is scheduled for completion in 2012.

The primary zone applied in the Tilbury area is Heavy Industrial (I2). This zone allows light industrial uses and most types of large manufacturing and processing industries.

The zone permits almost unlimited density. There are no caps on FAR, building height or site coverage (except as controlled by modest building setback requirements).

The developments in Table 17 are newer projects in Tilbury.

Table 17: Tilbury Industrial Developments

Address	Use	Site Area (acres)	Building Area (sq. ft.)	FAR Built	FAR Permitted
6805 Dennett Pl	Storage & Warehousing	2.22	48,790	0.50	No limit
7580 MacDonald Rd	Storage & Warehousing	1.37	25,264	0.42	No limit
6951 72nd St - Profiled below	Multi-tenant	8.7	223,617	0.55	No Limit

Profile of 6951 72nd Street, Delta (Table 18)

Located in the Tilbury industrial area, this is a multi-building strata project being developed by the Beedie Group on an 8.7 acre parcel in the Heavy Industrial (I2) zone. The development includes some office space on the ground floor, plus on a mezzanine level.

The first phase (Units 101 - 110) was completed in September 2010 and the second phase (Units 111 - 119) will commence construction once the developer has achieved 40% presales. The data below is for Building 1.

Table 18: 6951 72nd St, Delta

Building 1	**Proposed**	**I2 Zone Provisions**
Total Gross Floorspace - Industrial - Office	223,617 sq. ft. - 194,197 sq. ft. - 29,420 sq. ft.	No maximum
FAR	0.55	No maximum
Site Coverage	49.9%	60%
Height	39.2 ft.	No maximum
Parking - Industrial - Office	 1 stall / 2,002 sq. ft. 1 stall / 262 sq. ft. 210 total	 1 stall / 2,002 sq. ft. 1 stall / 280 sq. ft 203 total

4.4 Big Bend, Burnaby

The Big Bend area of south Burnaby has many types of industry, as well as some sub-areas with commercial uses such as retail, general office, and food and beverage. It has a long history as a location for heavy industrial activity, including wood processing and other forms of manufacturing. Many of these traditional users have a significant outdoor storage and/or production component.

Some sub-areas will remain in heavy industrial use, especially those in proximity to the Fraser River that need marine transport. However, other sub-areas - both greenfield and brownfield - within Big Bend are being developed for lighter forms of industrial use, much of it warehousing, storage and distribution related. The newer manufacturing operations are generally enclosed. The City has, however, found continued demand for sites that allow outdoor storage and/or production.

The draft Metro Vancouver RGS designates part of the Big Bend area as “Industrial” and part as “Mixed Employment.” However, even within the “Mixed Employment” area, there is development taking place that fits the definition of “Industrial” and is similar to industrial development taking place elsewhere in the region. This includes along North Fraser Way.

There are several industrial zones widely used by the City of Burnaby in the area, including:

- General Industrial (M2) zone, which allows many forms of industrial activity, including outdoor storage under certain conditions. The maximum permitted site coverage is 60% and the maximum building height is four storeys.

- Heavy Industrial (M3), which allows special types of industry and heavy industry. The maximum building height is four storeys, with no restriction on site coverage (other than as established by setbacks).

- Light Industrial (M5) zone, which allows light industrial uses that have a high standard of development and are wholly enclosed. The maximum permitted site coverage is 50% and the maximum building height is 39.4 ft.

There is no FAR maximum in any of the zones. Rather, density is established by setback, site coverage and building height provisions.

The City often applies Comprehensive Development (CD) zoning on top of these base zones and even combines elements of several zones together (e.g., M2 and M5) on a site-specific basis. So, each development is potentially unique in terms of the exact mix of permitted uses, building setback and height provisions, site coverage and other elements. So, what is built is essentially what is allowed. For that reason, Table 19 below excludes the "FAR Permitted" column.

Table 19: North Fraser Way Industrial Developments

Address	Use	Site Area (acres)	Building Area (sq. ft.)	FAR Built
7985 North Fraser Way	Food & Beverage Processing	2.41	43,740	0.41
8118 North Fraser Way - Profiled below	Multi-tenant	4.63	125,107	0.62
8138 North Fraser Way - Profiled below	Multi-tenant	4.99	108,740	0.50

Profile of 8118 and 8138 North Fraser Way, Burnaby (Table 20)

These two parcels are being developed by the Beedie Group and together total 9.62 acres. They are zoned CD M2/M5. Each parcel has one multi-tenant strata building that includes the potential for mezzanine floorspace in addition to ground level space.

This development is innovative because the two lots have a 25-foot wide shared driveway (i.e., 12.5 feet on each side of the lot line), with a cross easement, which saves space.

Table 20: 8118 and 8138 North Fraser Way, Burnaby

Planned	Lot 6	Lot 7
Total Gross Floorspace	125,107 sq. ft.	106,740 sq. ft.
FAR	0.62	0.50
Site Coverage	47.2%	43.6%
Height	26 ft.	26 ft.
Parking	110 stalls	94 stalls

4.5 Gloucester, Langley Township

The Gloucester area of Langley Township has been under development for over two decades and has substantial vacant land remaining. It is designated as "Industrial" in the draft Metro Vancouver RGS.

The vast majority of the developed sites in Gloucester are in two zones:

- General Industrial (M2), which permits general industrial use and service industrial uses such as commercial recreation, restaurants and service stations.

- General Industrial (M2A), which permits all the M2 zone uses, plus the processing, manufacture and repair of heavy machinery, equipment and transportation products.

The maximum permitted site coverage in both zones is 60% and the maximum building height is 39.4 ft. There is no explicit FAR cap. Rather, density is controlled by a combination of setbacks, building height and site coverage.

The types of densities being achieved are well below what the zones permit (Table 21). In one case - 26820 Gloucester Way – the business sells and services heavy equipment for logging, mining, road building and general construction. Much of this equipment is stored outdoors, which explains the FAR of only 0.21

The other case - 27101 56th Ave - is the production facilities and headquarters of a high value-added meat processing business that relocated from Vancouver in 2001. The facility employs about 250 people and there is a large office component in the building, but the FAR is still low, possibly to leave room for future expansion.

Table 21: Gloucester Industrial Developments

Address	Use	Site Area (acres)	Building Area (sq. ft.)	FAR Built	FAR Permitted
27101 56th Ave	Meat Processing	9.43	108,910	0.27	N/A
5111 272nd St	Storage & Warehousing	23.42	472,227	0.46	N/A
26820 Gloucester Way	Heavy Equipment Sales & Service	10.0	89,793	0.21	N/A
4848 275th St - Profiled below	Multi-tenant	7.42	142,215	0.44 (min)	N/A

Profile of 4848 275th St, Langley (Table 22)

The Beedie Group completed construction in 2008 of two buildings on this 7.42 acre site, which is zoned M2A. The buildings are multi-tenant strata and are designed as shell warehouse units (26 ft. clear ceilings), some with mezzanine levels. Each unit has both grade and dock loading and the units range in size from about 6,600 - 11,900 sq. ft.

The following data is for the two buildings combined and is taken from building plans. The floorspace and FAR are noted as minimums because mezzanines were added to some of the units, based on owner needs. This increased the total amount of floorspace and therefore the density, but by how much is unknown.

Table 22: 4848 275th St, Langley

Two Buildings	Built	M2A Zone Provisions
Total Gross Floorspace	142,215 sq. ft. (minimum)	N/A
FAR	0.44 (minimum)	N/A
Site Coverage	44.0%	60%
Height	39.4 ft.	39.4

4.6 Marine Drive, Vancouver

The Marine Drive area of south Vancouver is part of a much larger, long established industrial area stretching along the Fraser River that houses a wide range of light, medium and heavy uses. Many of the original industries located there because of good access to marine, rail and road transport, with some relying on all three modes to move materials and product.

As some of the larger older operations have closed, especially in the wood processing sector, sites have come on the market for redevelopment. Many are anticipated to remain in predominantly industrial use, but of a lighter variety.

Table 23 shows two sites currently in the planning stage of development that are representative of what the new generation of industry in the Marine Drive area will look like.

Table 23: Marine Drive Industrial Developments

Address	Use	Site Area (acres)	Building Area (sq. ft.)	FAR Built	FAR Permitted
9001 Heather St - Profiled below	Multi-tenant	7.1	151,405	0.49	5.0
508 – 598 East Kent Ave. South - Profiled below	Multi-tenant	11.14	290,249	0.6	5.0

Profile of 9001 Heather Street, Vancouver (Table 24)

Concert Properties assembled a group of properties, including a former sawmill site, in the Kent Avenue area in 2006 and 2007. The properties total 21.2 acres in size and are addressed as 9001 Heather Street and 8850 Ash Street.

Concert Properties has applied to the City of Vancouver to develop a 7.1 acre portion of the site at 9001 Heather Street under its current Industrial M-2 zoning. This is the predominant zone applied to Vancouver's waterfront industrial areas and permits a broad range of industrial activities, including manufacturing, warehousing, transportation and distribution, and wholesaling. There are certain other conditional uses in the M-2 zone that require the approval of the Development Permit Board. Examples are general office, retail and restaurants, all of which have size and specific use restrictions.

Table 24: 9001 Heather Street, Vancouver

	Proposed	Permitted in M-2 Zone
Total Gross Floorspace	151,405 sq. ft.	~1,546,000 sq. ft.
- Ground Floor	- 122,125 sq. ft. (81%)	-
- Mezzanine	- 29,280 sq. ft. (19%)	-
FAR	0.49	5.0
Site Coverage	40%	Limited by building setbacks only
Height (Clear Ceiling)	26 ft.	100 ft.
Parking		
- Ground floor	1 stall / 1,000 sq. ft.	1 stall / 1,000 sq. ft.
- Mezzanine	1 stall / 500 sq. ft.	1 stall / 452 sq. ft. (min) 1 stall / 618 sq. ft. (max)

The Concert Properties development will be a multi-tenant lease complex in two buildings in a front office, with a mezzanine partial second floor / rear loading format. Bays will be as small as 5,000 sq. ft. in size and each will have one loading dock and one grade door, with the ability to assemble bays into larger units. The loading areas are designed to accommodate standard 53-foot trailers.

According to Concert Properties, the site coverage of 40% is somewhat lower than it would have preferred, but is due to the irregular lot shape.

Profile of 508 – 598 East Kent Avenue South, Vancouver (Table 25)

This 11.14 acre property is being developed by the Beedie Group under existing M-2 zoning for Light Industrial – Wholesale Class A uses. The site was used for many years for wood processing and more recently leased by a steel fabricator during the Canada Line project.

Construction is about to begin on the site, which will eventually accommodate two buildings that are very similar in size. These will be strata units with mezzanines, starting at about 10,000 sq. ft. in size. The data below is for both buildings combined.

Table 25: 508 – 598 East Kent Avenue South, Vancouver

Two Buildings	Planned	M-2 Zone Provisions
Total Gross Floorspace - Building 1 - Building 2	290,249 sq. ft. - 140,602 sq. ft. - 150,347 sq. ft.	2,426,750 sq. ft.
FAR	0.6	5.0
Site Coverage	53%	Limited by building setbacks only
Height	31.4 ft.	100 ft.
Parking	1 stall / 927 sq. ft.	1 stall / 1,000 sq. ft.
Loading	60 stalls	18 stalls

4.7 Cambie/Clark, Vancouver

Some of the highest density industrial / quasi-industrial developments are occurring within or around the central area of Vancouver. The discussion that follows is intended to show what is achievable under certain conditions. However, this is not meant to imply that other industrial areas in the region are capable of attracting a similar intensity of development in the foreseeable future. With land priced at as much as $3.0 million or more an acre, much of what is happening in the central area is a product of unique location and development economics. Moreover, some of this development does not fully fit with how the draft Metro Vancouver RGS defines “Industrial”.

According to City planning staff, Vancouver has higher than average industrial densities in its Industrial I-2 zone, with an average FAR of around 0.7. This zone permits industrial and other uses that are generally incompatible with residential land use but are beneficial in that they provide industrial and service employment opportunities or serve a useful or necessary function in the city (i.e., many of the same types of PDR functions that the City of San Francisco is promoting – see section 3.5 for details).

The zone allows a maximum FAR of 3.0 (subject to certain conditions), so even at 0.7 FAR the typical development in the zone is well below what could be accommodated density-wise.

Where higher densities are found in the I-2 zone, they often include an office component as a separate principal use. For example, general office use is permitted as long as it does not exceed 33% of the total gross floor area of all uses combined.

An example of a higher intensity development in the City's central area is a building under construction at 120 and 122 West 8th Ave, known as Sterling Place. The developer is Pilatus Group Real Estate.

Located on a small lot in the I-1 zone (which differs from I-2 in that it permits 1.0 FSR office), this is a five storey building with underground parking and an FAR of about 2.2. It has four strata units totalling 8,500 sq. ft., including on wholesale/showroom unit, one warehouse/storage unit and two office units.[17]

The ability of Sterling Place to achieve this density is based on the value of the development being high enough to justify underground parking and the zone allowing general office as one of the uses. City planning staff estimate that average FARs for newer projects in the I-1 zone are generally about 2.0.

4.8 Summary

An FAR of 0.5 – 0.6 is the upper end of the density being achieved by most newer industrial developments in Metro Vancouver. There are examples of developments that are exceeding this density, but most are in the central area of Vancouver and include an office component that is not necessarily accessory to the primary industrial use.

The densities being achieved reflect the types of users seeking industrial land, many of which have a transportation component that requires large surface areas for loading and tractor trailer manoeuvring. Some also have outdoor storage and/or production needs that further reduce density as measured by FAR or site coverage.

Some increase in the intensity of industrial land use is likely in the short to medium term. However, a major increase in the average densities on industrial land is not anticipated in the foreseeable future. There is still enough industrial land available in the region on both greenfield and brownfield sites to meet most types of demand in conventional development forms.

Where the higher FARs of 0.5 or more are being achieved, it is primarily through office uses occupying mezzanine or full second floor space. With rare exception, warehousing and manufacturing do not occupy space above the ground level in multi-storey buildings. As elaborated upon in the next chapter, this is primarily a function of economics and business operations, not zoning restrictions on density.

While some may consider the intensity of use of Metro Vancouver's industrial land to be relatively low, comparison to the six metropolitan areas that were reviewed in Chapter 3 suggests that Metro Vancouver has somewhat higher overall utilization of its industrial land than most jurisdictions.

[17] Pilatus Group Real Estate website.

5. Factors Influencing Industrial Land Intensification

This chapter of the report discusses the degree of influence that a number of factors may have on how intensely industrial land is used in the region. Some of the factors have very limited influence, or at least ability to be changed by any actions that Metro Vancouver and its partners might undertake, but it is important that this is known so that efforts to increase utilization are focussed on areas where there are opportunities for results.

Examples are provided of how some municipalities are dealing with industrial land intensification. However, this study is not a critique of the industrial zoning or other land use practices of individual municipalities. There are opportunities for changes that might at least modestly enhance intensification in some industrial zones, but each municipality must decide for itself what is most appropriate based on its particular community interests.

5.1 Location and Land Values

Location and land values are key factors that cannot be separated – they need to be considered together. As discussed in Chapter 4, the intensity of much of the newer industrial development does not significantly vary across much of the region, noted exceptions being where outdoor storage is permitted and on certain sites within the core area of Vancouver. Yet, there are significant differences in land values between industrial areas in Metro Vancouver, as was discussed in Chapter 2.

Logic might suggest that the more expensive industrial sites would have an appreciably higher utilization and that can certainly be the case. But, there is more to it than just the cost of land. Each business has its own unique mix of suppliers, markets, labour force requirements and transportation needs that influence location. Some are prepared to pay more to be in a certain location than others. It does not necessarily mean that how intensively they use the land is different.

However, there is a declining supply of well located industrial land in the region – the preference of most businesses is not to be located on the fringes of the region, especially up the Fraser Valley in places like Abbotsford and Chilliwack, despite cheaper land prices. As the cost of land continues to rise, it can be expected that many of the most under-utilized sites in the region will undergo redevelopment

It is also expected that, over time, the most desirable areas will be fully developed and there will be stronger competition for well located land. That will push land prices higher but will not always significantly boost utilization.

Industry sources suggest that industrial land prices would need to be at least $3.0 million per acre, which is well above the current average price in the region, in order for multi-storey warehousing and manufacturing to begin to make economic sense for even some businesses. And for many, the nature of their operations would preclude them from going into that building form. Rather than intensifying, they might be pushed to the fringes of the region or perhaps relocate to another region altogether, similar to what has happened in San Francisco.

At around $3.0 million per acre, conventional industrial building forms and densities do not make sense to construct for most users because of the economics of development. Table 26

illustrates this point using a simple proforma for basic warehouse or manufacturing space with a small office component.

Table 26: Proforma for Three Industrial Land Development Scenarios

	Scenario 1 – One Storey Bldg.	**Scenario 2 – One Storey Bldg.**	**Scenario 3 – Multi-Storey Bldg.**
Key Assumptions*			
Cost of land	$1.0 million	$3.0 million	$3.0 million
FAR	0.5	0.5	1.5
Building cost per sq. ft. (construction & development)	$70	$70	$160**
Building efficiency***	100%	100%	90%
Total Project Capital Costs	$2,525,000	$4,525,000	$13,454,000
Total Annual Operating Costs****	$265,000	$423,000	$1,251,000
Gross Rent per sq. ft.	$12.17	$19.44	$20.15
Less recoveries (taxes, insurance, repairs & maintenance)	$3.00	$3.00	$3.00
Net Rent per sq. ft.	**$9.17**	**$16.44**	**$17.15**

* Common assumptions: 1.0 acre (net) of land, single tenant, 75% loan to principal ratio, 5% loan interest rate amortized over 20 years, 8% required return on equity and triple net rent.
** The cost per sq. ft. is higher for a multi-storey building because of more structural engineering, the need for an elevator and other requirements.
*** Building efficiency is lower for a multi-storey building because of items such as elevators.
**** Operating costs include: mortgage payments, return on equity amount, property taxes, repairs & maintenance, insurance and property management.

Scenario 1, which is typical of the kind of industrial development currently happening in the region, assumes an acre of land priced at $1.0 million and a one storey building with an FAR of 0.5. A developer / landlord would require a net rent of $9.17 per sq. ft., which is in line with the rents being charged for some newer industrial space in the core of the region.

Scenario 2 takes the same development and assumes an acre of land priced at $3.0 million, resulting in the developer / landlord needing to charge a net rent of $16.44 per sq. ft. There are very few industrial businesses in Metro Vancouver that would be willing or able to pay that kind of rent.

Scenario 3 assumes an acre of land priced at $3.0 million and a multi-storey building with an FAR of 1.5. The net rent at $17.15 per sq. ft. is even higher than under Scenario 2, but with an added drawback. Not only are there few industrial businesses that could afford that rent but even fewer that could operate efficiently in a multi-storey building (unless the upper floors were office).

5.2 Floor Area Ratios

FAR is used to control density in some industrial zones in the region, but not all, as was discussed in Chapter 4. The practice varies between municipalities and also between

industrial zones within some municipalities. More municipalities are using building height, setback and/or site coverage requirements instead of FARs to define maximum density.

Current FAR maximums are not a constraint to intensification in most cases, with the majority of industrial developments well below the maximum permitted FAR even in newly developing areas. So, they are a key factor, but not a barrier at this time in most of the region, although some zones could have their FARs increased to make certain there is enough room to accommodate higher densities if the demand is there.

The only way in most cases to get significantly higher FARs is to go multi-storey, with office above. As the economics do not work for multi-storey warehousing or manufacturing in the region, except in very unusual cases, this is not how more intense use will be made of most industrial land in Metro Vancouver in the foreseeable future.

5.3 Building Site Coverage

Building site coverage is typically in the 40 - 50% range in the region among newer industrial developments, although up to 60% or slightly more is being achieved. Some sites have higher coverage, but that is not the norm (again with the noted exception of some properties in the central area of Vancouver).

More municipalities are not specifying site coverage as they update their industrial zones and instead controlling building footprints using only setback requirements.

The District of Mission controls minimum as well as maximum site coverage in two of its zones:

- Industrial Business Park One (INBP1) zone, which requires a minimum of 33% site coverage, with a maximum of 60%. However, this zone allows a number of non-industrial uses, such as general office, so the minimum site coverage would be surpassed with little difficulty.

- Industrial Light Impact One (INL1) zone, which requires a minimum of 25% site coverage, with a maximum of 50%.

This is an unusual approach and there has been longstanding debate among planners about the appropriateness of setting minimums as well as maximums in a zone (unless it is a CD zone). But it is an interesting attempt to ensure that there is at least some use on a site beyond just outdoor production and/or storage.

For many industrial operations, site coverage maximums in zoning bylaws are not a constraint because of outdoor storage, loading and tractor trailer parking and manoeuvring requirements, which reduce building footprints. Nevertheless, there have been situations where site coverage restrictions have affected the intensity of development.

5.4 Building Setbacks

The required front, rear and side yard building setbacks vary considerably among industrial zones in Metro Vancouver, ranging from zero to 25 feet or more, depending on circumstances. Even within a municipality, there can be significant differences between industrial zones.

The reasons for the setback requirements are understandable in some cases, such as where the industrial use is adjacent to a non-industrial use such as residential. However, in other cases the rationale is less clear, other than an apparent desire to create space between industrial buildings even if little or none is needed for functional purposes. The effect on the intensity of land use, as measured by building site coverage or at least efficient building placement on a lot, can be significant where setbacks are unnecessarily high.

5.5 Building Heights and Storage Systems

Most industrial buildings in Metro Vancouver are one storey in height. Where there is a full or partial (mezzanine) second story, it is almost always for office use. There are few pure industrial operations in the region that have a full second floor.

A notable trend that is very relevant to intensification of use is higher ceilings, especially in warehousing operations. The typical ceiling height (clear span) for most kinds of warehousing in the past ranged from 20 to 24 feet. Now ceilings are as high as 34 feet and, in some cases, 40 to 50 feet or more. This is occurring because of improvements in high density storage / racking systems, which allow products and materials to be stacked higher. So, one storey of 30 to 40 foot high warehouse space acts like two floors of traditional warehouse floorspace.

Racking systems are also being used that allow for deeper storage. For example, rather than pallets being stored one deep on racks, there are systems that allow pallets to be stored two, three or even more deep. This increases the amount of storage by reducing the number of forklift aisles required.

So the use of industrial land is being intensified in some warehouse operations, but it is through different ways of storing products and materials rather than by adding to building floorspace. Most industrial zones in the region have relatively high maximum building heights, but there are some that may be set too low.

5.6 Outdoor Storage

A growing number of municipalities require storage and production to be mostly or entirely enclosed in the majority of their industrial zones.

This can sometimes give the illusion of greater utilization of a site, but it is not necessarily the case that more activity is occurring or more jobs being created. Rather, what otherwise would have been taking place outside is now inside.

The trend towards more industrial activity being enclosed is partly being driven by industry itself. But it is also motivated by the desire by some municipalities to discourage what are perceived as “eyesore” or “nuisance” uses.

There are still many industrial businesses that require an outdoor storage and/or production component and they need areas where they can operate. They are an important part of the regional economy and should not be pushed out based purely on the belief that placing more building floorspace on a lot automatically makes for more intense use, although it is recognized that there may be other legitimate reasons for their exclusion.

5.7 Physical Site Features

Industry has traditionally sought the flattest land in the region given the nature of most forms of production, storage and distribution activity. There are examples of industry built on sloped sites around the region, but this is not the preference of most industrial businesses.

It should be assumed that the vast majority of industrial development in the region will continue to occur on the flattest land. This may affect how intensely some areas can be economically developed because some of the flattest land is found on sandy, silt laden soils, often interspersed with clay and peat, within the Fraser River delta.

These geotechnical conditions are not ideal for construction and present load bearing challenges that have to be addressed through a variety of shallow and deep foundation solutions. Since some of these solutions can be costly, the tendency is to spread the load bearing, which means building out rather than up.

Another physical factor influencing the intensity of industrial land use is environmental features. Many municipalities have introduced more stringent environmental protection measures in recent years, including wider riparian area building setbacks and enhanced tree preservation regulations. As well as reducing developable land area, these measures can also lead to irregular lot shapes that are less efficient to develop.

Site contamination sometimes also impacts on industrial land intensification. Where sites require costly soil remediation, this can discourage their redevelopment, often leaving them in lower intensity outdoor storage use.

5.8 Parking Requirements

Parking affects the intensity of use of industrial land, as it does for every type of use. There are significant variations in industrial parking standards among Metro Vancouver municipalities. Some municipalities regulate based on specific use, meaning that two or more parking standards may be applied to a single development, while others just have an industrial standard. Complexities can arise when the industrial use changes on a property, with the new user sometimes ending up with more parking than required and, in other cases, not enough.

The City of Burnaby uses an additional formula that includes number of jobs. For manufacturing and industrial uses, the requirement is one parking stall for each three employees or for each 1,000 sq. ft. of gross floor area, whichever is greater. For warehousing, storage and wholesaling, it is one parking stall for each three employees or for each 2,000 sq. ft. of gross floor area, whichever is greater.

The required parking stall dimensions, the percentage of small car stalls permitted and driving aisle widths also vary between the municipalities.

The average size of an employee / visitor parking stall is about 170 sq. ft., plus an added allowance for the driving aisle. For surface parking, the key issue is not the cost of each stall but rather the loss of space that might otherwise be put to more productive use.

There is rarely consideration of location in setting industrial parking standards (e.g., proximity to good public transit). There is also no consideration of economies of scale in parking

requirements. Visitor parking is an example. It does not logically follow that an industrial building that is four times as large in floorspace as another industrial building necessarily has four times the visitor parking needs.

The question has been raised during the course of this study about the opportunity for underground or rooftop parking as a means of intensifying land use. For one level of underground parking, the cost would typically be in the range of $25,000 - $40,000 per stall, depending on lot size, soil conditions and the type of building. This is not economically viable for the vast majority of industrial businesses.

Rooftop parking would also be very expensive and is considered by developers to be cost prohibitive in nearly all cases because of structural requirements. Rooftop parking is done for some commercial developments in the region, but the economics are very different for the typical commercial operation than for industry.

5.9 Loading Requirements

As with parking, there are significant variations between municipalities in the amount and type of loading space required. In general, up to 120 feet is needed by users for a manoeuvring aisle for tractor trailer units and 53 foot loading bays for the trailers. About half those lengths is needed for five ton vehicles, which are shorter and more manoeuvrable.

However, many industrial operations exceed the minimum requirements set out in municipal zoning bylaws, especially in multi-tenant strata developments where the developers want to ensure that there are ample loading bay opportunities to suit the needs of a range of prospective users.

5.10 Driveways and Road Standards

Driveways can consume a significant amount of area if they run the depth of a lot (i.e., to access rear loading, parking and/or storage). Where there is the opportunity to do so, efficiency can be increased by sharing driveways between adjacent properties using cross easements. As was discussed in Chapter 4, this is already being done for some newer industrial developments, especially where the developer owns both properties.

There are noticeable differences in road standards among industrial areas in the region. Some rights-of-way are as much as 60 - 70 feet wide, containing 40 foot road cross-sections plus generous allowances for sidewalks and landscaping.

Wider rights-of-way and road cross sections may be justified in some cases, but in other cases they can be excessive and reduce the net amount of developable land for industrial use.

5.11 Accessory Uses – Office and Retail

Each municipality handles accessory office and retail uses in its industrial zones in a different way. Some municipalities set a maximum percentage for office and retail permitted in industrial zones (with some zones not permitting a retail component at all) and others just refer to these uses as being accessory or ancillary, which is typically interpreted as 49% or less.

Accessory office use is seen by industrial businesses as an integral part of their operations – they do not perceive it as "non-industrial." Industrial properties with more intense use almost always have an office component, which is often achieved through partial second storey / mezzanine floorspace.

Accessory retail space is more prevalent in some industrial areas than others based on zoning, location and type of industrial business. Retail may lead to more intense use of industrial land in some cases, but there is a less convincing argument to be made that it should be a widely accepted as a significant accessory use in industrial zones on that basis alone. For example, some municipalities have found that accessory retail floorspace can begin to expand over time in a building to the point that it is no longer an accessory use but rather the primary use. If other properties begin to follow suit, what is supposed to be an industrial area can begin to evolve into a commercial area.

5.12 Lot Size / Shape

Larger lots (one acre or more) are typically more efficient to develop than smaller lots because setback, driveway, parking, loading and other requirements are often the same for small and large parcels, meaning they occupy a smaller percentage of the lot for larger lots and leave more room for industrial activity. That is the primary reason why most of the development taking place in newer industrial areas is on larger lots of at least two acres and often more.

However, where there are minimal or no building setback and site coverage restrictions, highly efficient use can be made of very small lots, as the City of Vancouver has found on a number of its I-1 zoned properties.

5.13 Land Ownership and Assembly

A challenge in securing reasonably sized parcels of land in some areas that are ready for redevelopment is land assembly. Owners of older properties that are at the point where they could be redeveloped are not always motivated to sell for a variety of reasons (e.g., good cash flow, land continuing to appreciate in value, capital gains taxation issues). Other owners have unrealistic price expectations. This is constraining some industrial redevelopment opportunities in the region and therefore the intensification that often comes with a new generation of uses.

5.14 Pre-zoning

Where there is rezoning required, one potential approach that can be considered to motivate industrial land assembly and redevelopment is pre-zoning by the municipality. That provides greater certainty in the marketplace and might accelerate some assembly opportunities. However, most municipalities are reluctant to get involved in pre-zonings because they lose control over many aspects of the development review and approval process that typically accompany an owner-initiated rezoning. This includes situations where there are off-site works and service upgrades and other contributions that are normally negotiated as part of the rezoning process.

5.15 Building Size and Age

Most of the largest industrial buildings in the region - some exceeding 400,000 sq. ft. - are purpose-built. What they look like and how intensely they use the land is determined by the specific needs of the business operator. Some operators have outdoor storage requirements and others want room for potential future expansion.

As discussed in Chapter 4, some of the smaller buildings being constructed in the region are multi-tenant strata developments. They appear to have, on average, higher site utilization than some of the larger purpose-built buildings, but it is not always the case.

Where the highest utilizations are being achieved, the buildings have at least a full or partial second floor. In almost all cases, this space is for office use.

In terms of older industrial buildings that have low densities, it is not typically the case that they are retrofitted as part of redeveloping a site since most have reached the end of their economic life by that time. The cost of bringing these buildings up to current building code standards can be high and, in any event, many are not designed in a way that efficiently accommodates most types of modern industrial uses.

Industrial infill, which is where existing building site coverage on a lot is increased by adding another building, sometimes occurs in the region, but it is not a common practice because, as with retrofitting, it often does not result in the most efficient way of operating on a site.

What is more common is small accessory buildings being added over time for storage and other uses that need to be enclosed in industrial zones, where such accessory buildings are permitted in the zone. This sometimes prolongs the life of an industrial use on a site.

5.16 Building Construction Costs

As was discussed in section 2.5, the typical construction cost per sq. ft. of industrial floorspace is currently in the range of $75 - $85, but, can be as low as about $60. However, the cost per sq. ft. is higher for multi-storey buildings because of added structural and other requirements (e.g. elevators and fire separation). This can make an industrial development uneconomic unless a higher sales price or lease rate per sq. ft. can be achieved, which depends on what the market will bear in a given location.

5.17 Landscaping Standards

Excessive landscaping standards can affect intensity of use if there is too much emphasis on landscaping that requires wide planting strips. This can diminish the useable area of a lot.

5.18 Building Design Guidelines / Green Buildings

Building design guidelines are intended to influence the form and character of development. While they may add to the cost of an industrial development, they generally have no influence on how intensely a parcel of land is used because they cannot, by law, be so stringent as to affect the maximum density that a zone permits.

Similarly, imposing higher green building standards through programs such as Leadership in Energy & Environmental Design (LEED®), may increase building construction costs, but have no apparent impact on intensity of use in industrial areas.

5.19 Summary

Table 27 summarizes the factors that were discussed in this chapter and assigns a high, medium or low rating to each factor in terms of its relative degree of importance to industrial land intensification in Metro Vancouver. There is obviously a degree of subjectivity in assigning the ratings and they can vary considerably on an area or site-specific basis. As well, many of the factors are strongly inter-related and are difficult to isolate in terms of exactly how much each on its own influences intensification. It is most often a combination of factors and this combination can vary.

Table 27: Factors Affecting Industrial Land Intensification in Metro Vancouver

Intensification Factor	Relative Degree of Importance		
	High	Medium	Low
Type of industrial use	√		
Location and land values	√		
Floor area ratio regulations		√	
Building site coverage regulations		√	
Building setback regulations	√		
Building height regulations		√	
Outdoor storage regulations	√		
Physical site features		√	
Parking requirements	√		
Loading requirements			√
Driveways and road standards		√	
Accessory use regulations - office and retail	√		
Lot size / shape		√	
Land ownership and assembly		√	
Pre-zoning			√
Building size			√
Building age		√	
Building construction costs		√	
Landscaping standards		√	
Building design guidelines / green buildings			√

Generally, the factors that are considered to have the most significant influence on industrial land intensification region-wide are:

- The type of industrial use, with some activities better able to intensify (if the measure is FAR or building site coverage) than others based on the nature of their operations.

- Land values and location, with the highest densities (as measured by FAR) generally found in areas of the region with the highest land values.

- Building setback regulations, which if set too high can create space with little productive use.

- Outdoor storage regulations, which can reduce building site coverage and FAR (while recognizing that this is not necessarily a negative).

- Parking requirements, which can also create space that could be better utilized if set too high.

- Accessory uses, especially office and retail, which are often found where there are industrial sites with higher utilization.

FAR and site coverage are given a medium rather than high rating here because how intensely a business chooses to use a piece of land is not always reflected in these two measures. Some businesses place a high value on the ability to have at least some outdoor storage and/or production capabilities and also want to be in relatively central locations in the region, even if they have to pay more for land. Industrial land use is intensifying in some cases without increased FARs and site coverage by using higher ceilings and new types of racking systems, especially in warehousing. With greater storage capacity, much more efficient use can be made of a given area of floorspace.

Zoning regulations are important factors, but overall are not the main impediment in most cases to industrial land being more intensely used. Nevertheless, there are a number of changes to aspects of industrial zoning and related provisions that could help modestly increase the intensity of use on at least some industrial land in some locations within the region in the short to medium term. These are further addressed in the next chapter on recommendations.

6. Recommendations

This chapter presents recommendations on potential actions that could be taken by municipalities, developers and Metro Vancouver to promote and facilitate industrial land intensification in the region.

6.1 Municipalities

There are dozens of different industrial zones in Metro Vancouver municipalities and many more than that if CD zones on industrial properties are added to the tally. Some of these industrial zones were written into municipal zoning bylaws decades ago and have changed little since then. Some are still relevant, but others reflect outdated views of how industry operates and the economics of development in the region.

Municipalities might consider whether their industrial zones should be updated for a variety of reasons, one being to encourage greater intensification. It is recognized that variances can be granted by municipalities to many aspects of a zone (except use and maximum density) on a case-by-case basis, but this is not an efficient way of managing land use. Variances should rarely be needed if the zoning provisions are properly set.

In addition to zoning-related issues, recommendations are also provided in this section on landscaping and road standards.

Uses

The permitted uses in an industrial zone affect the density of development that can realistically be achieved.

There are wide differences between Metro Vancouver municipalities in how they specify permitted uses. Some provide succinct definitions of permitted uses and others spell out in great detail what is allowed. Moreover, there are significant differences in how accessory (also called ancillary) uses such as office and retail are managed, with some zones setting the maximum as a percentage of the total gross floor area (e.g., 25%) and others specifying only that it be accessory to the primary use (i.e., 49% or less).

Allowing a higher proportion of accessory office and retail use (i.e., 49% of total gross floor area) would be one way of potentially creating higher densities in industrial zones. However, some municipalities have found that, over time, office and retail rather than industrial use have become the primary activities in areas intended for industry. As well, the draft RGS envisions these kinds of activities as more appropriate for areas better served by public transit and in close proximity to population centres.

Site Coverage

The allowable site coverage should be at least 60% where municipalities wish to specify site coverage restrictions. A number of municipalities have done away with site coverage restrictions altogether and simply rely on building setbacks and surface parking to control coverage.

Floor Area Ratios

Most developments are not, at this point, pushing up against the FAR maximums set in the zones. However, some are starting to gradually close in and should be reviewed, especially if they are below 1.0.

Some municipalities do not specify an FAR in their industrial zones and rely upon building height, site coverage and setback requirements to control density. This appears to be a growing trend. The City of Coquitlam, for example, is in the midst of a major overhaul of its industrial zones that proposes to reduce the number of zones from nine to possibly three or four. It is proposing to remove FARs as a density control as part of this process.

The Cities of Burnaby and Port Coquitlam and Corporation of Delta are other examples of municipalities that do not use FARs in some or all of their industrial zones.

Building Setbacks

Some industrial zones require front, rear and side yard setbacks that are excessive. Higher setbacks are appropriate when the industrial property is adjacent to other types of uses, especially residential, but they make less sense when put into a pure industrial context. The result can be dead space that has no functional use.

Zero rear and side-yard setbacks may be appropriate in some circumstances.

Landscaping Standards

Some municipalities have moved towards requiring a higher standard of landscaping in industrial areas that includes wider planting strips – either through more land dedication for boulevards or bigger front yard setbacks. Some also require walkways in addition to sidewalks. The desire to enhance the appearance of industrial areas is understood, but some of the standards appear excessive and are reducing the usable area of sites.

While an aside to the issue of utilization, it can be readily observed by travelling through some of the industrial areas in the region where higher landscaping standards are required that making a developer install the plantings is one thing, but making the tenant or property owner properly maintain the landscaping is another matter altogether.

In pure industrial areas, the value of high landscaping standards that require wide planting strips and the loss of usable space is questionable.

Building Heights

The permitted building height in most zones should be at least 40 feet and preferably much higher in order to accommodate the higher ceilings that some operations, especially some of the newer warehouses, are seeking. Except where located adjacent to residential or certain other uses, the logic for restricting building heights to standards set decades ago is unclear.

Parking and Loading

There are significant differences between municipalities in the parking and loading requirements in industrial zones, with no apparent logic for why they are so different. Parking and loading consume a large amount of surface area and can needlessly constrain intensity of use if set too high.

It may be appropriate in some cases to also consider different parking standards in a zone based on location within the community. Although the exception, there are industrial areas in the region located within close proximity to good public transit, yet they are often required (except by variance) to provide the same amount of parking as developments as in industrial areas some distance from any form of frequent transit service.

Shared Driveways

Some municipalities permit shared driveways (with cross easements) between two adjacent industrial properties under certain conditions. This cuts the driveway requirement for each property in half and can save up to 12.5 feet or even more. This is a significant opportunity for improved site utilization where conditions allow for it.

Road Standards

The road widths required in some industrial areas appear high given the type and volume of traffic using them. This reduces the net developable area and therefore utilization not just of a specific site but a whole area.

6.2 Development Industry

Most industrial developers believe that they are making the most efficient use possible of industrial sites as they are developed or redeveloped based on market demand. Where there are opportunities for greater utilization, developers often point to municipal regulations as a key roadblock.

There is considerable attention paid to housing in the region and the need for greater efficiency of land use to improve affordability, reduce the costs of municipal servicing and so on. In contrast, far less attention has been paid to industrial land and how it is being used and the consequences for businesses and the economy. There has been more focus on the issue in the past several years as a result of the Metro Vancouver RGS process, but far greater education and discussion is needed on how industrial land is used and why.

The development industry, including real estate brokers, needs to be involved in an organized way in helping the regional and municipal policy-makers and land use regulators understand industrial development trends, the economics of industrial land development, the kinds of businesses seeking industrial land and their needs. The focus should be on giving sound technical information and factual advice that can be translated into OCP and other policies, zoning and other land use regulations.

6.3 Metro Vancouver

Metro Vancouver has started the dialogue on the future of industrial land in the region through the Metro Vancouver RGS process and the industrial land inventory study. While there may not be agreement among all parties at this point on the specifics of how industrial lands should be used, at least many of the issues are on the table. Building on the draft RGS, Metro Vancouver has a role in educating the public, development industry, municipal officials and politicians about these issues.

There is also a coordinating role that Metro Vancouver can play in continuing to move the process along on the practical ways that industrial land can be better utilized though zoning and other mechanisms. This could be done, for example, by creating an advisory committee composed of municipal planners and engineers and industrial developers and real estate brokers, supported by Metro Vancouver staff, to review the issues and offer workable solutions for consideration by municipalities and the development industry.

Another area where Metro Vancouver can play a role is information sharing by tracking the inventory and utilization of industrial land over time in the region. The *Industrial Lands Inventory for Metro Vancouver* update project draws upon BCAA data that includes the site area and building floorspace (where known) for every industrial property in the region. This allows industrial FARs to be calculated and, while not the only way of defining utilization, identifying these FARs and rolling them up into area-specific and region-wide FAR averages would provide a good snapshot of what is happening on the ground. Assuming that the inventory is regularly updated, which it should be, this information could then be tracked over time to see where and how industrial FAR utilization is changing within the region.

Several other research projects could be undertaken with more detailed data on regional employment and industrial land characteristics. For example, significantly more detailed Census employment data can be acquired for industrial areas. One benefit would be a deeper understanding of the types of industries that are clustered on industrial land, whereas the current aggregate data combines warehousing, truck transportation, and other types of transportation that in reality are likely to be very different users of industrial land. This more detailed analysis could also provide greater clarify on the type of non-industrial businesses that are currently found in industrial areas, as well as the stereotypically industrial activities that are found outside industrial areas. This analysis would provide further insight into the land use requirements of projected employment growth in key sectors and how growth will affect the future supply of industrial land.

With better data on the characteristics of industrial properties, a statistical analysis of the data could explore the relationships between development densities, land values, building ages, types of land use, location in the region, proximity to key transportation corridors, and possibly other variables of interest. While it is likely (and desirable) for this statistical analysis to confirm many of the findings in this report (such as the relationship between higher land values and higher development densities), anomalies may be uncovered related to specific parts of the region or particular land uses. These anomalies would lead to further investigation and result in a better understanding of key industrial intensification factors.

These potential research topics are all ideally suited for Metro Vancouver to adopt a lead role in the region.

Appendix 1: Contacts

Organizations

Industrial Committee of the Urban Development Institute, Vancouver

NAIOP Commercial Real Estate Development Association, Vancouver

Individuals

Raul Allueva, Planning and Development, City of Coquitlam

Brent Beatson, Concert Properties, Vancouver

Rob Blackwell, Anthem Properties, Vancouver

Leeland Blanchard, Industrial Sales and Leasing, Cushman & Wakefield, Vancouver

Chris Clibbon, City-wide and Regional Planning, City of Vancouver

Dan Diebolt, Anthem Properties, Vancouver

Rick Eastman, Cushman & Wakefield, Vancouver

Ed Ferriera, Industrial Properties Group, CB Richard Ellis, Vancouver

Jim Francisco, Land Use Policy and Planning, City of Calgary

Dave Gormley, Beedie Group, Burnaby

Beth Harrington, Beedie Group, Burnaby

Chris Hartman, TFN Economic Development Corporation, Tsawwassen

Tom Hauger, Department of Planning and Development, City of Seattle

David Hawkins, Sustainable Community Development, District of North Vancouver

Steve Kountz, Bureau of Planning and Sustainability, City of Portland

Gertrude Kwan, Planning and Development, City of Surrey

Yvette Luke, Land Use and Development, Corporation of Delta

Paul Magoria, Cushman & Wakefield of California, San Francisco

Jennifer Natland, Planning and Development, Port Metro Vancouver

Paul Nowlan, City-wide and Regional Planning, City of Vancouver

Conni Pallini-Tipton, City Planning Department, City of Los Angeles

Barclay Pitkethly, Planning Department, District of Mission

Gary Pooni, Brook + Associates Inc., Vancouver

Jeff Rank, Cushman & Wakefield, Vancouver

Larry Retzlaff, Planning and Policy, City of Edmonton

Stephen Richardson, Development Services - Community Development, Township of Langley

Travis Seawards, Regional Planning - Community and Municipal Services, Los Angeles County

Graeme Silvera, Plenary Group, Vancouver

Matt Snider, Planning Department, City of San Francisco

Erica Tiffany, Planning and Development, City of Coquitlam

Richard Wozny, Site Economics Ltd., Vancouver

Anthio Yuen, Research Group, CB Richard Ellis, Vancouver

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