



SUMMARY REPORT:

Opportunities for the Intensive Use of Industrial Land



metrovancouver
SERVICES AND SOLUTIONS FOR A LIVABLE REGION

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INTRODUCTION AND PURPOSE

Metro Vancouver's Regional Growth Strategy, adopted in 2011, seeks to protect the region's established industrial land base and promote the intensification capacity of industrial use on those lands.

With a limited supply of available lands in the region and a growing population, intensification of industrial lands is increasingly important and necessary to foster economic and employment growth. Limited site options and high land prices are a challenge for industrial businesses wishing to expand or move to the region. Allowing non-industrial uses into industrial areas further depletes the supply of industrial land and destabilizes the areas. With no foreseeable expansion to the supply of industrial lands and ongoing demand, industrial intensification will help to extend the lifespan of the industrial land base in the region.

The main purpose of the detailed discussion paper titled "Best Practices

for the Intensive Use of Industrial Land", adopted by the Metro Vancouver Board in November 2012, is to identify best practices for increasing the potential for more intensive industrial use of industrial lands, and provide direction about how these best practices could be adapted to Metro Vancouver's particular circumstances. The results of this work are summarized in this booklet.

Industrial intensification means optimizing the industrial land potential by allowing sites to achieve higher density forms of industrial development, and by facilitating new growth through the re-development of existing under-utilized sites.

The benefits of industrial land intensification include: the opportunity to accommodate increased economic and employment activity on a limited land base, more efficient use of lands and resources, reducing impact on the environment, using transportation infrastructure more efficiently,

and reducing the pressure to convert agricultural and rural lands to industrial uses.

This paper explores how municipalities, landowners and developers can achieve more industrial density and intensity on industrial lands through a variety of means such as better building designs, greater efficiencies, flexible zoning, and appropriate plans and incentives. It recognizes that there are different types of industrial users needing different types of accommodations and locations.

Potential industrial land intensification techniques and practices were investigated through: literature review, review of best practices from other jurisdictions, review of Metro Vancouver municipal industrial zones, case studies of industrial buildings from within the Metro Vancouver region, and results from workshops with industry participants, municipalities and other agencies.

INDUSTRIAL LANDS CONTEXT

Purpose and Desired Outcome

Given the limited industrial land supply and high land prices in Metro Vancouver, using the land base as efficiently as possible is increasingly important and appears inevitable in the long term. Yet often industrial lands appear to be under-utilized, and there are very few examples of multi-level industrial buildings in the region.

The challenge is to identify the most viable ways to increase intensities and densities while still providing for industrial buildings which meet the needs of users. Intensification is not a panacea, and will not be appropriate in all locations, however, it is an important contribution to extending the lifespan of the remaining supply of industrial lands, allowing businesses to grow, and reducing pressure to convert agricultural and rural lands to industrial uses.

Industrial land intensification use and design potential has received relatively little attention in planning research and policy documents. This paper provides lessons for intensive industrial development to guide best practices for the Metro Vancouver region while reflecting local contexts and issues, and not compromising the functional requirements of industry.

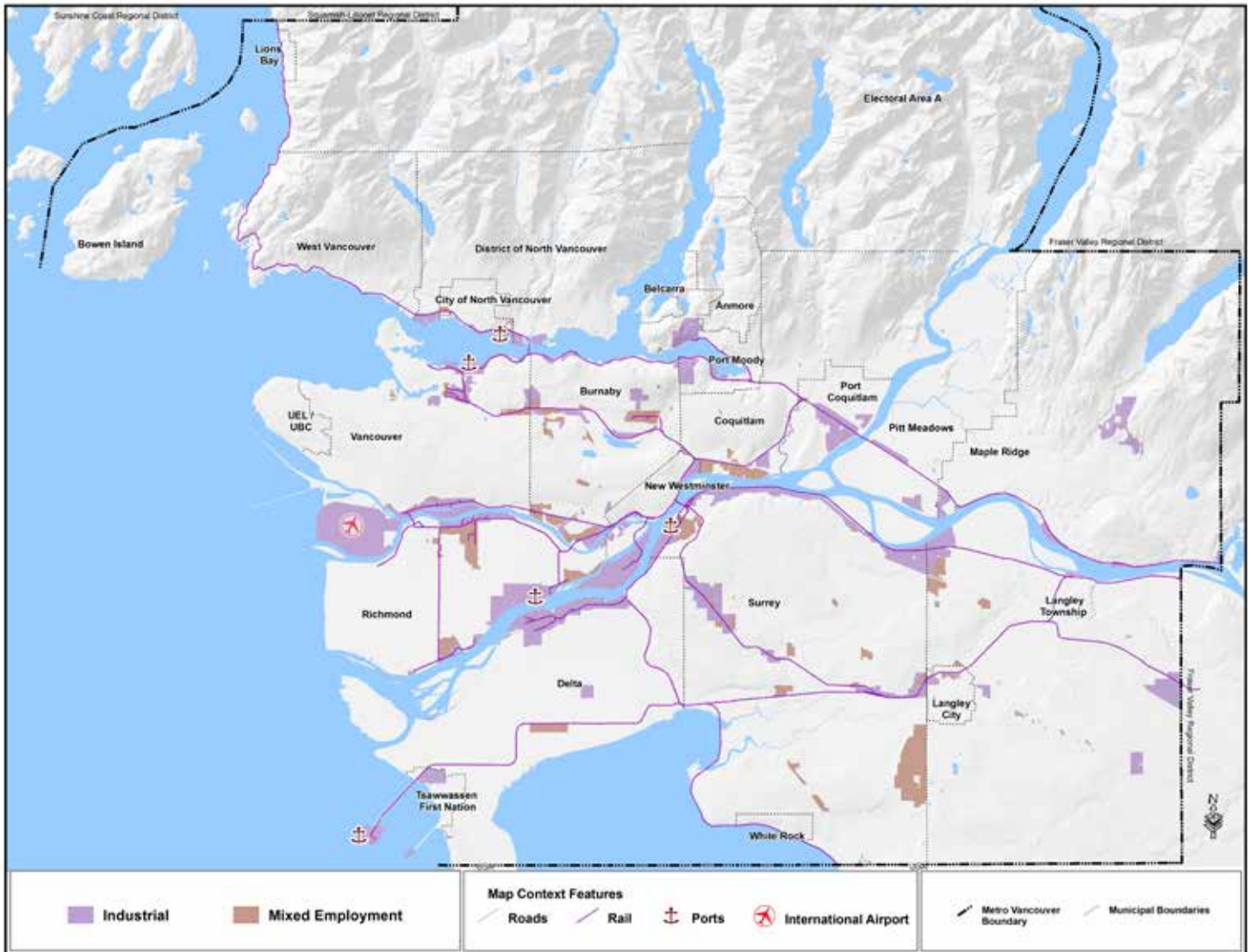
Regional Growth Strategy Industrial Lands Policies

Responding to continuing population and economic growth on Metro Vancouver's limited land base, and protecting and using the region's industrial lands for the vital industrial sectors is a key element of economic sustainability in the Regional Growth Strategy.

To protect the region's ability to attract investment and jobs, the Regional Growth Strategy establishes regional land use designations exclusively for industrial and other employment uses. The 'Industrial' and 'Mixed Employment' regional land use designations protect lands for industrial uses. Major office and retail developments are directed to Urban Centres and Frequent Transit Development Areas.

As defined in the Regional Growth Strategy:

- **Industrial lands** are intended for industrial activities, and appropriate accessory uses which may include limited office and retail. Residential uses are not intended.
- **Mixed Employment** allows for industrial uses as well as a greater variety and size of office and retail uses. This designation recognizes that there are established areas which contain a mix of industrial and commercial uses. These areas are intended to continue to support industrial activities, and complement and support the planned function of Urban Centres and Frequent Transit Development Areas. Residential uses are not intended.



Map 1: Regional Growth Strategy - Industrial and Mixed Employment Land Use Designations

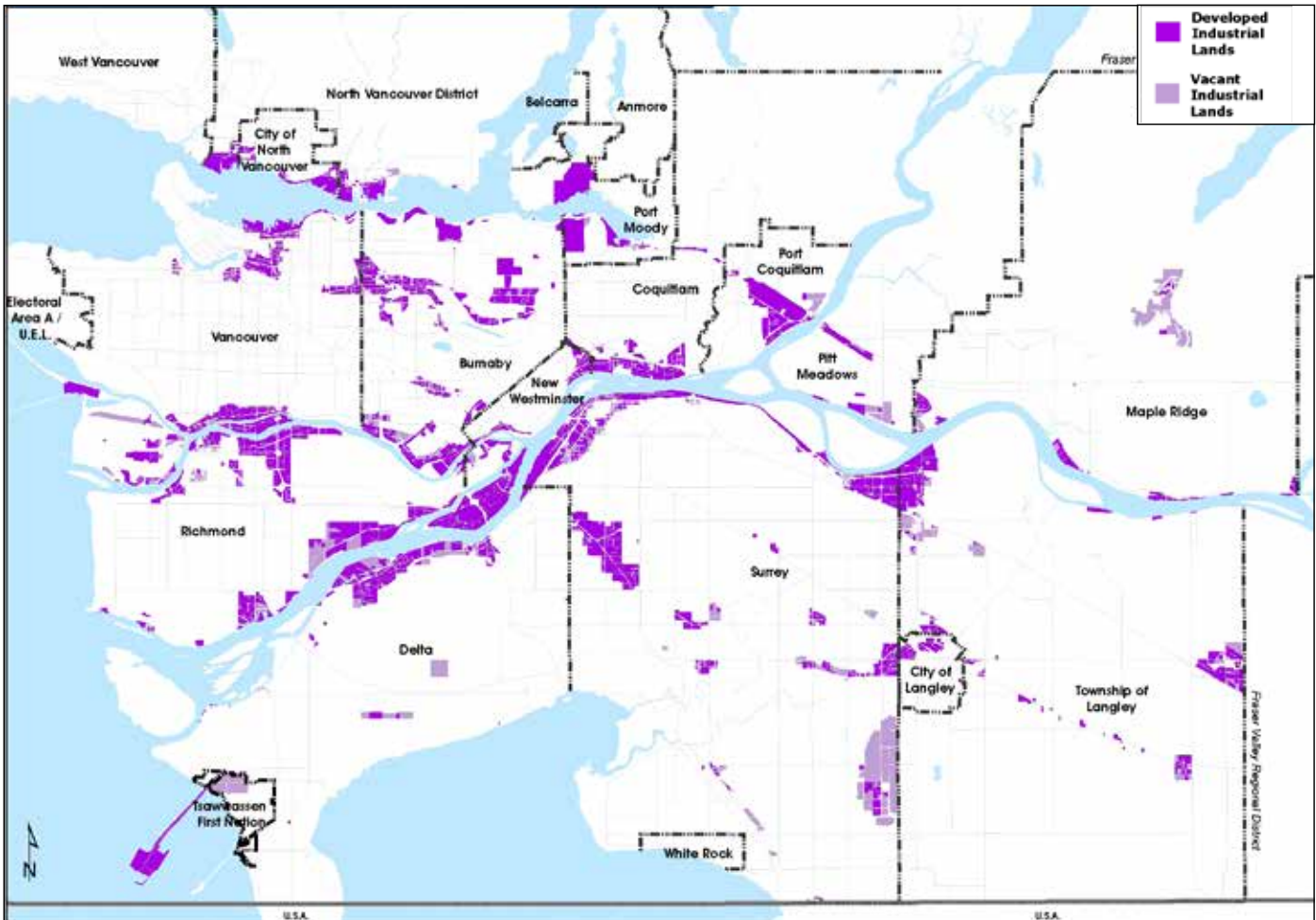
Transportation Network

TransLink’s Major Road Network (MRN), provincial highways, and municipal roads designated for truck movement provide goods movement access to industrial areas. Industrial land intensification can also impact the MRN and available transportation capacity, which should be a consideration on where to intensify industrial land.

Also important for some industries is access to rail lines and waterways.

Servicing Industrial Areas with Transit

It is desirable for industrial areas to be accessed by walking and cycling and served with transit. Industrial areas tend to have low building and job densities, are located on highways and major roads away from other urban uses and are relatively dispersed, are generally not mixed land uses, and usually have limited pedestrian amenities and transit service. The typical characteristics of industrial areas do not usually support high levels of transit service. Yet, a larger number of workers located in industrial areas will increase expectations for transit services.



Map 2: Metro Vancouver 2010 Industrial Land Inventory

Metro Vancouver Industrial Land Inventory

The Metro Vancouver 2010 Industrial Land Inventory for the region identifies all lands designated for industrial use by municipal plans. The inventory classifies industrial land as either developed or vacant, as defined in the study. It is important to note that this is a ‘gross’ estimate of vacant industrial lands; some may be currently occupied by non-industrial uses, or have environmental, topography, servicing/infrastructure or other development constraints, or may be ‘poorly’ located. Conversely, some of the developed lands have re-development potential. These factors affect the potential for the industrial land supply to meet future demand.

The inventory findings indicated that in 2010 there were 11,430 hectares (28,200 acres) of industrial lands, of which 8,746 hectares (76%) were developed (21,600 acres) and 2,685 hectares (24%) were vacant (6,600 acres).

Over the 2005-2010 period, approximately 500 hectares (1,200 acres) or an average of 100 hectares (250 acres) per year of lands were developed as industrial lands. (See Figure 1)

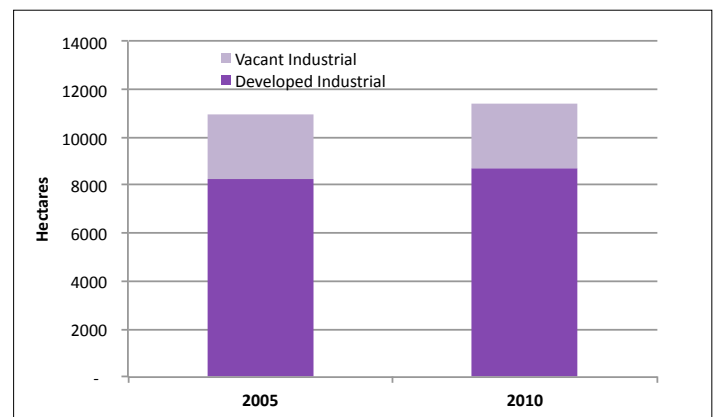


Figure 1: Change in Industrial Land Inventory 2005 - 2010

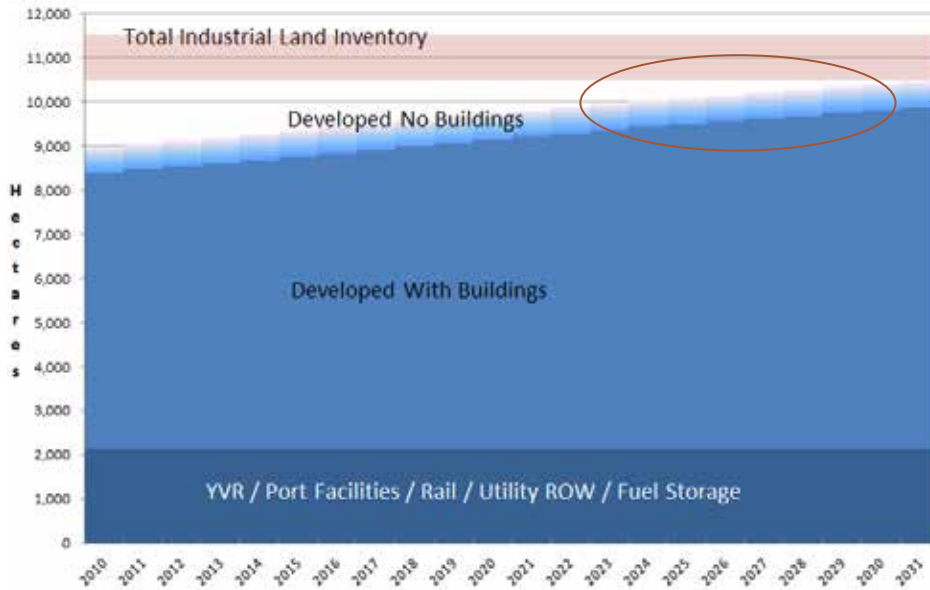


Figure 2: Land Demand Scenario 1 – Proportional Growth

The region starts running out of industrial land in the late 2020's under Scenario 1 and in the early 2020's under Scenario 2.

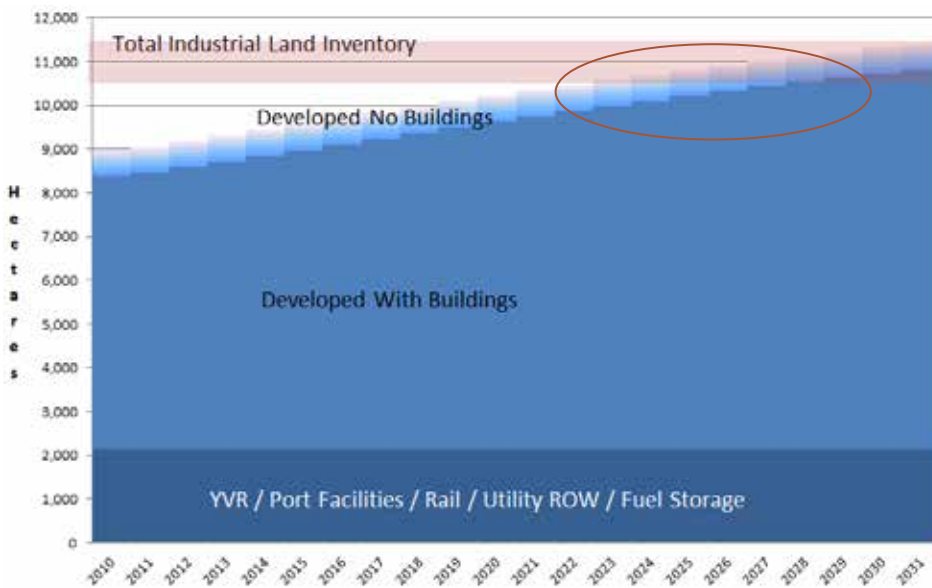


Figure 3: Land Demand Scenario 2 – Base Plus High Case Import/Export Growth

Metro Vancouver Industrial Land Supply Depletion

To estimate industrial land demand and illustrate the depleting industrial land inventory, two scenarios have been prepared: a proportional increase in the current industrial development; and adding a substantial increase in land demand related to 'High Case' growth in trade activity through Metro Vancouver ports.

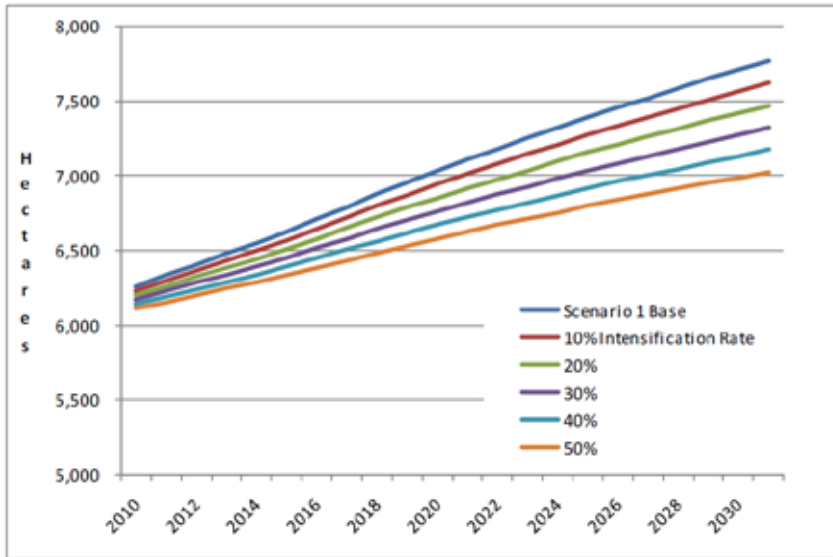
On the above figures the pink band represents the total industrial land capacity. The total 11,400 hectares includes a buffer of approximately 1,000 hectares to recognize constraints on industrial development viability.

Under Scenario 1 (Proportional Growth), without intensification, industrial demand would require an additional 900 hectares by 2021, and another 700 hectares by 2031.

Under Scenario 2 (Base Plus High Case Import/Export Growth), assuming no intensification, industrial land demand would require an additional 1,400 hectares by 2021, and another 1,100 hectares by 2031.

These charts illustrate how soon the limited supply of industrial land in the region will be consumed.

More efficient use of industrial land could extend the effective capacity of the land base. The chart provides an estimate of the reduction in land demand for given intensification rates. Including all sectors under Scenario 1, for every 10% of total new floor area constructed through expansion or redevelopment on existing developed industrial lands, approximately 150 hectares of the vacant industrial land would be preserved over the 21 year period from 2010 to 2031.



Intensification could be an effective tool to extend the lifespan of industrial lands.

Figure 4: Estimated Reduction in Industrial Land Demand Through Intensification

As the vacant land supply diminishes the supply of industrial sites becomes more scattered and remnant. Already the supply of available vacant large parcels is limited, as shown in Figure 5. On the other hand, limitations on the available land supply will be offset somewhat by redevelopment of currently developed industrial lands.

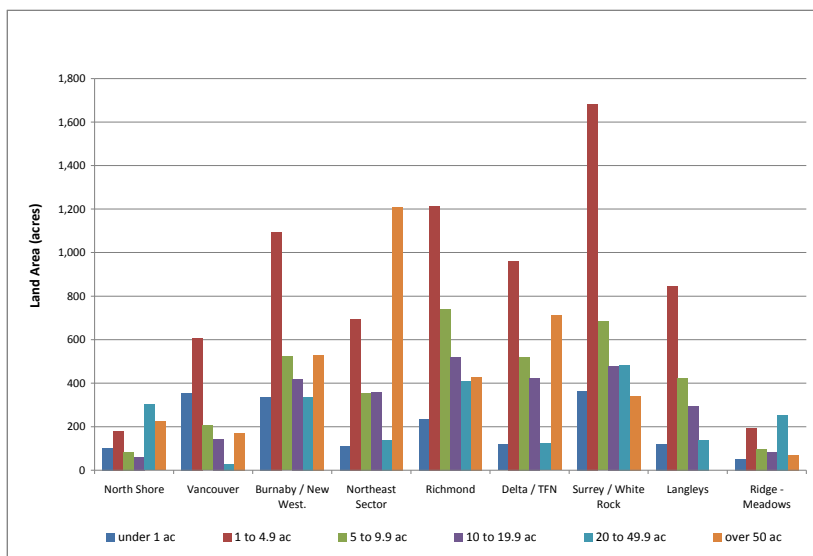


Figure 5: Developed Industrial Lands by Parcel Size and Subregion, 2010



Photo of light industrial building with roof-top parking in South Vancouver with flex space for multiple tenants. Roof-top parking reduces the need for as much surface parking and can allow for greater building site coverage.

Industrial Employment

In 2010 approximately 310,000 jobs or 25% of Metro Vancouver's estimated 1,250,000 total employment was located within the Industrial Land Inventory. For the relative share of sector jobs within the Industrial Land Inventory, manufacturing sector businesses are by far the largest at 22% of jobs, followed by Transportation/Warehousing and Wholesale Trade both at 14%, Retail Trade (9%) and Professional/Technical Services (7%).

As expected, jobs in the Manufacturing, Wholesale Trade, Transportation and Warehousing sectors are most prominently located within the Industrial Land Inventory, yet a substantial portion of those activities also occur outside of the Industrial Land Inventory.

Industrial Businesses

Overall, approximately 24% of all businesses in Metro Vancouver are located within the Industrial Land Inventory.

Construction related businesses are most prominent and make up approximately 16% of total businesses on industrial lands, followed by Wholesale activities at 15%, and Manufacturing at 11%. Most industrial areas include accessory uses and businesses such as restaurants or small scale commercial facilities to serve the working population.

Industrial Building Floor Space and Land Area by Sector

On the 6,250 hectares of developed industrial lands with buildings, there was in total approximately 25.6 million m² (275 million sq ft) of buildings (all forms).

The largest sectors are Manufacturing (consuming 26% of both the building space and land area) and Wholesale Trade (18% both), followed by Retail Trade (13%/14%) and Transportation/Warehousing (9% both), and Construction (9%/10%). Sectors such as Construction and Transportation/Warehousing generally require much more land and building space with a comparatively low number of jobs.

LITERATURE REVIEW

Available international literature publications relating to industrial land uses and development, specifically intensification, cover efforts to intensify industrial lands, potentially through land use policies, better building designs, more flexible zoning, and government incentives.

Clearly, good location is strongly desired for businesses and supports industrial development. However, a 'good' location varies by business and industry, with proximity to highways being of increasing importance.

Many industrial businesses desire larger parcels of land in order to accommodate their horizontal design buildings along with ample space for other site uses such as parking, loading and storage. Additionally, businesses will typically acquire more land than they initially require in order to accommodate potential future business expansions. Businesses want the opportunity to expand at their existing facility rather than experiencing the disruption associated with relocating to another site.

The literature indicates that industrial productivity increases with increased densities and location economies. This may be through advantages associated with proximity to suppliers, customers, competitors, and workers, which allow for increased value output per unit. Also, the types of businesses may vary by location and circumstances, with different sectors generating different levels of economic and employment activities.

Overall, encouraging increased industrial intensification, while also ensuring provision of necessary features for industrial users such as functional building designs and proximity to highways, can lead to higher business output per both worker and unit of land. This can generate positive benefits to the surrounding region, through economic growth, increased innovation and efficiency, greater employment, and also a reduction in the consumption of industrial lands.

The two figures on the following page conceptually illustrate industrial intensification for a theoretical site. A two level building design can accommodate a conventional industrial tenant in the ground floor and light industrial uses on the upper floor, allowing for more building space, greater efficiencies, and more business activity and employment on the site compared to conventional development.

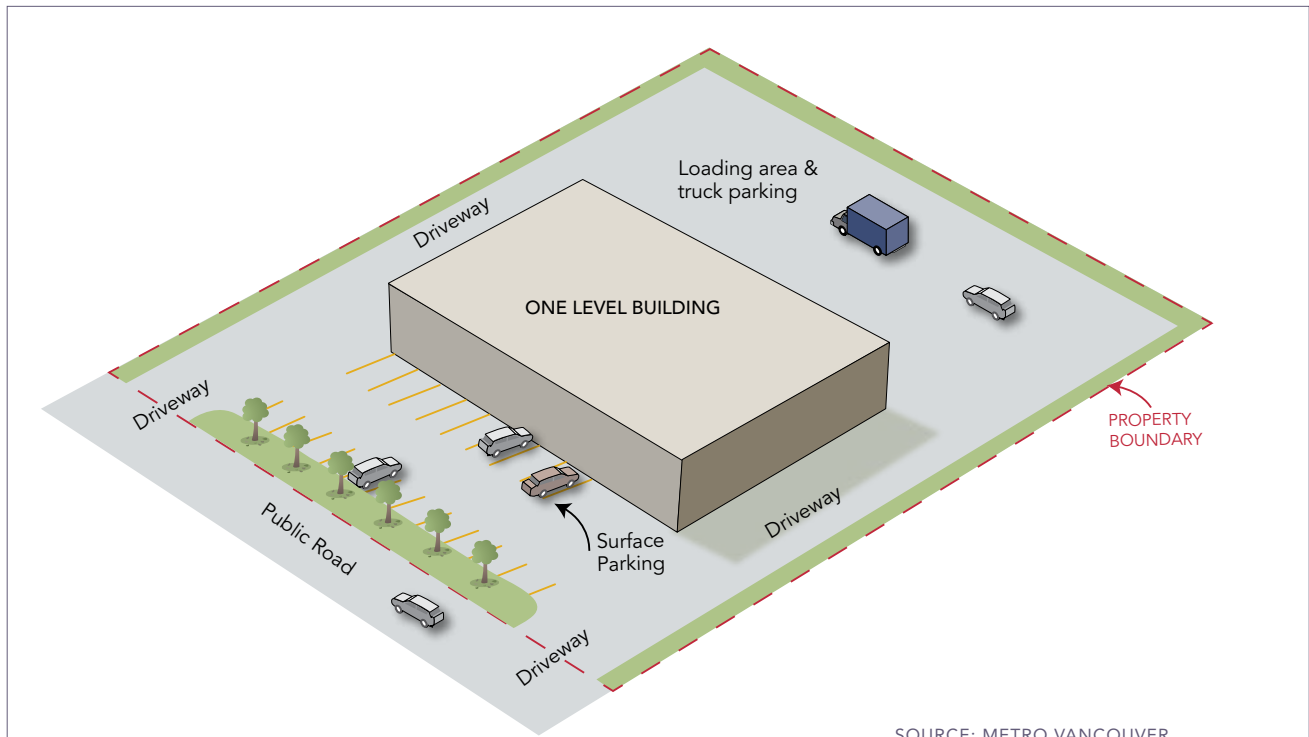


Figure 6: Conceptual drawing of conventional industrial development with single level building and low floor area ratio.

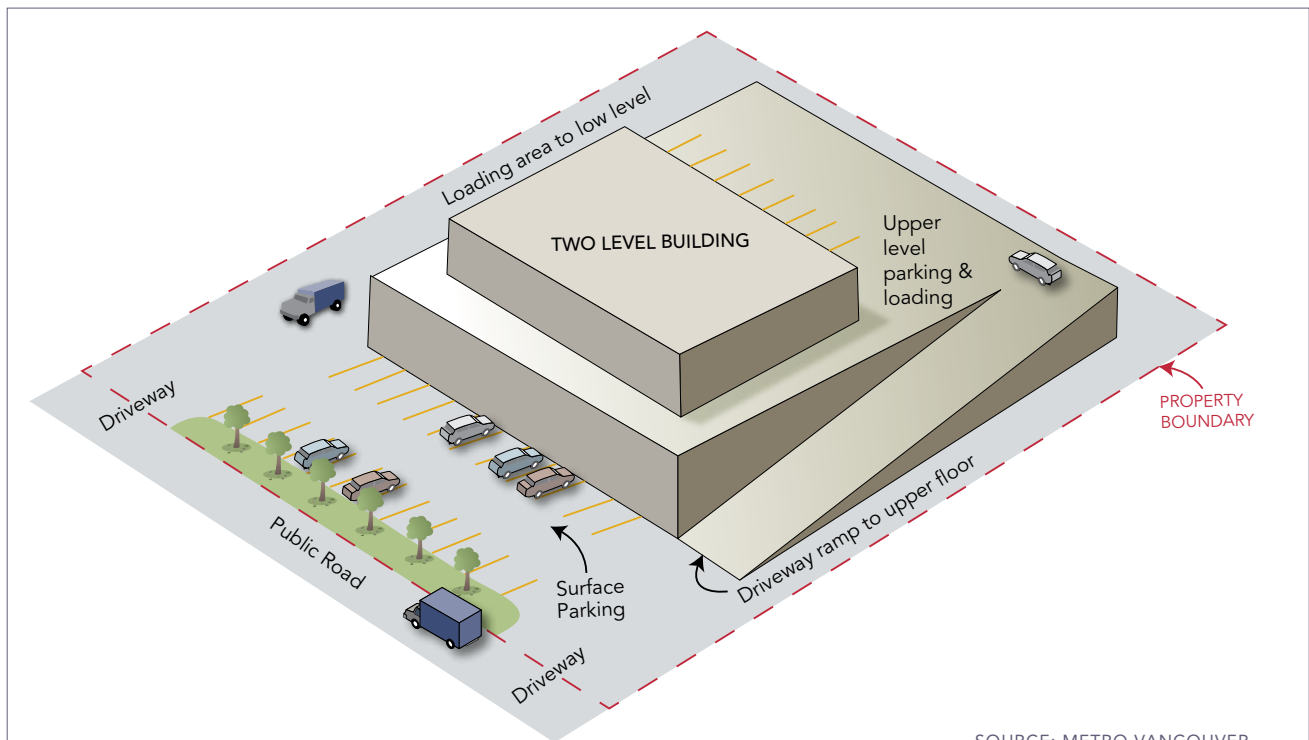


Figure 7: Conceptual drawing of higher density multi-level industrial building with light industrial use and parking on upper level.

DEFINING INDUSTRIAL INTENSIFICATION FORMS AND MEASURES

Defining Industrial Land Intensity/Density

There are many different potential methods to measure industrial land intensity or density. Industrial intensification means more productive and efficient industrial activities. Although, maximizing different measures may lead to different outcomes, and these may not all be 'true industrial' uses. Additionally, it is important to recognize that some industries are land intensive and that not all industries are building-intensive or job-intensive. Accordingly, different measures may be appropriate for different industrial sub-sectors.

Often higher intensities are associated with higher densities, but this is not always the case. Exceptions are land-intensive industrial uses that can have high throughput activity on a site without a significant amount of building (such as a lumber mill, or storage facility). Additionally, certain businesses require significant amounts of land for truck loading, vehicle parking, and outdoor storage of equipment and materials.

Alternatively, the intensity of a site can increase without necessarily a commensurate increase in building density, through such means as upgrades in equipment (such as warehouse racking), automation, or increasing the number and shifts of workers.

Measures of Industrial Intensity/Density

Following are descriptions of some measures of industrial intensity and density:

Intensity:

- Employee per land acre/hectare or per building sq ft/m² (labour intensity)
- Business revenue/profit per unit (value generated per unit of land, or building floor area)
- Volume of goods produced/processed/stored per unit (per building floor space, amount of land, employee, or some other measure)
- Vehicle or equipment movement per hour (trucks, loading, crane lifts)
- Quality and pay of jobs (education and pay levels)
- Number and diversity of businesses per land area
- Multiplier job impacts of different types of businesses (secondary and induced impacts on wider economy)
- Value of lands and improvements
- Value or level of equipment/technology investment (such as automation, racking warehouses)
- Level of building specialization
- Building lease absorption period, vacancy rates, rental rates
- Transportation infrastructure (port, airport, rail yards, highways) utilization rates (goods/trips per unit)

Density:

- Building floor area ratio (building floor space divided by lot area)
- Building site coverage (building floor plate/coverage divided by lot area)
- Number of floors (with upper floors potentially being used for other uses)
- Building height/volumes (such as higher ceiling 'high bay' warehouses)



Multi-level industrial building in Surrey with light industrial use on ground floor and flex space and parking on upper floor. This is an example of a building with higher floor area ratio yet conventional site coverage.

To best ensure that the desired and appropriate form of industrial development is encouraged, multiple applicable measures of intensity and density should be used. It may be most appropriate that different measures be used to encourage different forms of industrial intensity/density depending on the industrial sub-sector.

Higher density/intensity industrial building forms need to work financially for the developer, be approved by the regulatory authority, be acceptable to the market, and meet the needs of the ultimate tenant. Building designs must recognize the evolving requirements of different types of industrial users, reflecting their needs and impacts on surrounding areas.

It is important to note that an increase in employment in industrial areas may have other impacts. These employees may generate additional traffic by commuting, have higher expectations about transit service, desire shops and services in the immediate area for

their lunch and convenience, and want recreational and other amenities. These types of users may conflict with certain industrial activities and reduce the appeal of the area for some industrial users. Also, potentially allowing increased retail and office functions in these areas may raise land values and destabilize the area for industrial users.

Higher intensity industrial development may be more appropriate at locations close to frequent transit service

INDUSTRIAL LAND INTENSIFICATION INTERNATIONAL BEST PRACTICES

As part of the best practices review of industrial land intensification, the relevant industrial land use plans, strategies, studies, and zones of 13 city-regions outside Metro Vancouver were examined.

Each of these city-regions has different histories, development patterns, transportation networks, economies and industrial sectors, governance systems, and land use pressures from non-industrial activities. There are also varying visions and definitions of industrial intensification and the jurisdictions vary with the focus and detail of their plans. Cities where land is of short supply are more likely to have industrial land protection and intensification policies, with most focus on land protection.

Challenges with Industrial Intensification

While many jurisdictions have completed studies and set out comprehensive planning and zoning policies to protect industrial lands from the encroachment of non-industrial uses, increasing industrial intensity has been limited and faces many challenges. For instance, shifting economies result in changes in land use and building requirements. As an example, Hong Kong's situation, where industrial activities moved into Mainland China,

allowed for some industrial building conversions into office and commercial spaces. Similarly in San Francisco, limited land supply and high prices have resulted in a loss of many forms of industry to other parts of the region and to lower cost areas.

While zoning in many North American jurisdictions allow for relatively high maximum Floor Area Ratios (FARs), actual FARs are significantly lower reflecting financial and market demand. Also, office or other uses in industrial areas can cause tensions. While most zoning regulations specify that ancillary office use related to industrial activity is permitted, maximum size restrictions vary. In some cases significant amounts of non-industrial uses are permitted in zoning bylaws, potentially driving away industrial users.

Industrial land intensities and densities appear to be relatively low in most North American jurisdictions compared to the Metro Vancouver region. All jurisdictions are experiencing pressures to convert industrial lands to other uses. The main focus by other jurisdictions is on protecting industrial land

supplies and addressing declines in industry, rather than industrial land intensification.

There are few new significant examples of higher density or multi-level industrial developments in North America. New buildings with higher densities are achieved through significant office space or other non-industrial components. Historic multi-level industrial buildings were built under very different conditions and in many cases have since been converted to non-industrial uses. Modern industry generally prefers single level buildings for functional purposes over multi-level buildings and need good location/access.

In Asia, with a very limited land base and growing population and economy, as well as government agencies with strong powers, there have been capital-intensive innovations in the form of multi-level industrial buildings for certain sectors. In Europe, historic multi-level industrial buildings are still used for industrial purposes or are being converted to other purposes.



Modern transparent vehicle factory in Germany. SOURCE: VW MEDIA SERVICES



Modern warehousing and logistics facility with high ceilings. SOURCE: ISTOCK PHOTO



Modern manufacturing facilities. SOURCE: CANSTOCK PHOTO



High Volume Hong Kong Port Kwai Tsing Container Terminals and Los Angeles/Long Beach Port Facilities. SOURCE: HONG KONG SPECIAL ADMINISTRATIVE REGION GOVERNMENT

EXAMPLES OF INDUSTRIAL BUILDINGS AND ZONING IN METRO VANCOUVER

Case Studies of Industrial Buildings

In order to inform research about potential levels of industrial intensity in Metro Vancouver, examples in the region of buildings with industrial components were profiled (these can be found in the discussion paper). These building case studies are for projects from throughout the region and reflect notable examples of higher intensity industrial or quasi-industrial development and modern industrial facilities, noting that intensity is not always a function of the amount of building floor area (density).

The form of development range from 1 to 3 level buildings, some with site coverage nearly 100%. In some cases underground parking was part of the development, and some with roof top parking. The building floor area ratios range from approximately 0.4 to 3.0.

In some cases the business operations are increasingly efficient through consolidated functions/operations or through high-tech equipment which allows for higher output/throughput even if not necessarily more building floor area. Generally, businesses

need both an industrial component along with an associated office component at the same site. This can be accommodated in flex space type buildings, typically with a multi-level mezzanine office component at the front and an industrial component with rear loading access at the back.

The types of buildings vary by geography, with the higher density buildings being generally located on higher value lands in the City of Vancouver. Outer areas generally have businesses requiring larger spaces for their operations and needing access to highways. Building designs and densities reflect the needs of the business users.

Municipal Zoning Bylaws

With a limited land base and rising land values, industrial developers are increasingly exploring ways to more efficiently use industrial land through larger buildings. However, some municipal zoning regulations may needlessly limit the potential amount of industrial development on industrial sites through building siting, setback, buffers, height and other regulations. Municipal zoning bylaws could be reviewed and updated to ensure that they allow potential higher intensity and density industrial development while still maintaining provisions for appropriate industrial development design forms and land uses.

Overall, these building case studies illustrate the potential for higher intensity use in select locations and conditions, be it through multi-level buildings, parking on roofs or underground, higher site coverage and floor area ratios, or more efficient operations. The photos on the following page are examples of higher intensity industrial buildings in Metro Vancouver.

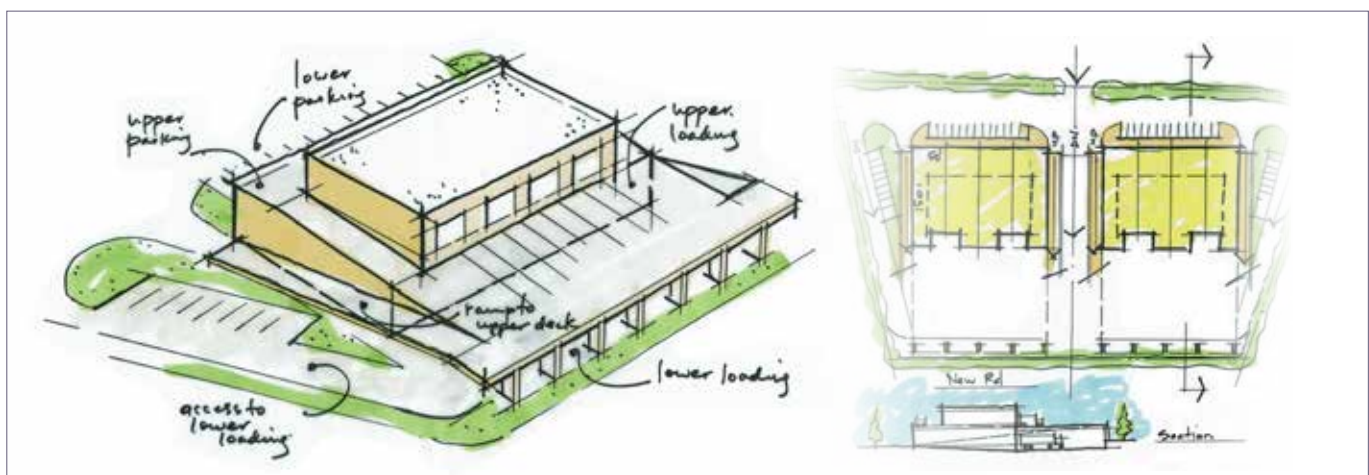


Three level building in Mt. Pleasant Vancouver with underground parking, light manufacturing and associated accessory uses.



Two level building in Mt. Pleasant Vancouver with underground parking accommodating an industrial bakery facility serving stores in the region along with associated office and retail space.

GATHERING IDEAS: INDUSTRY LANDS WORKSHOPS



Conceptual design of multi-level industrial building based on ideas generated from workshops.

SOURCE: OMICRON

Metro Vancouver hosted three Industrial Lands Development and Intensification Workshops in mid 2012. Participants included industrial developers, brokers, planners and architect consultants, as well as regional and municipal planning and engineering staff.

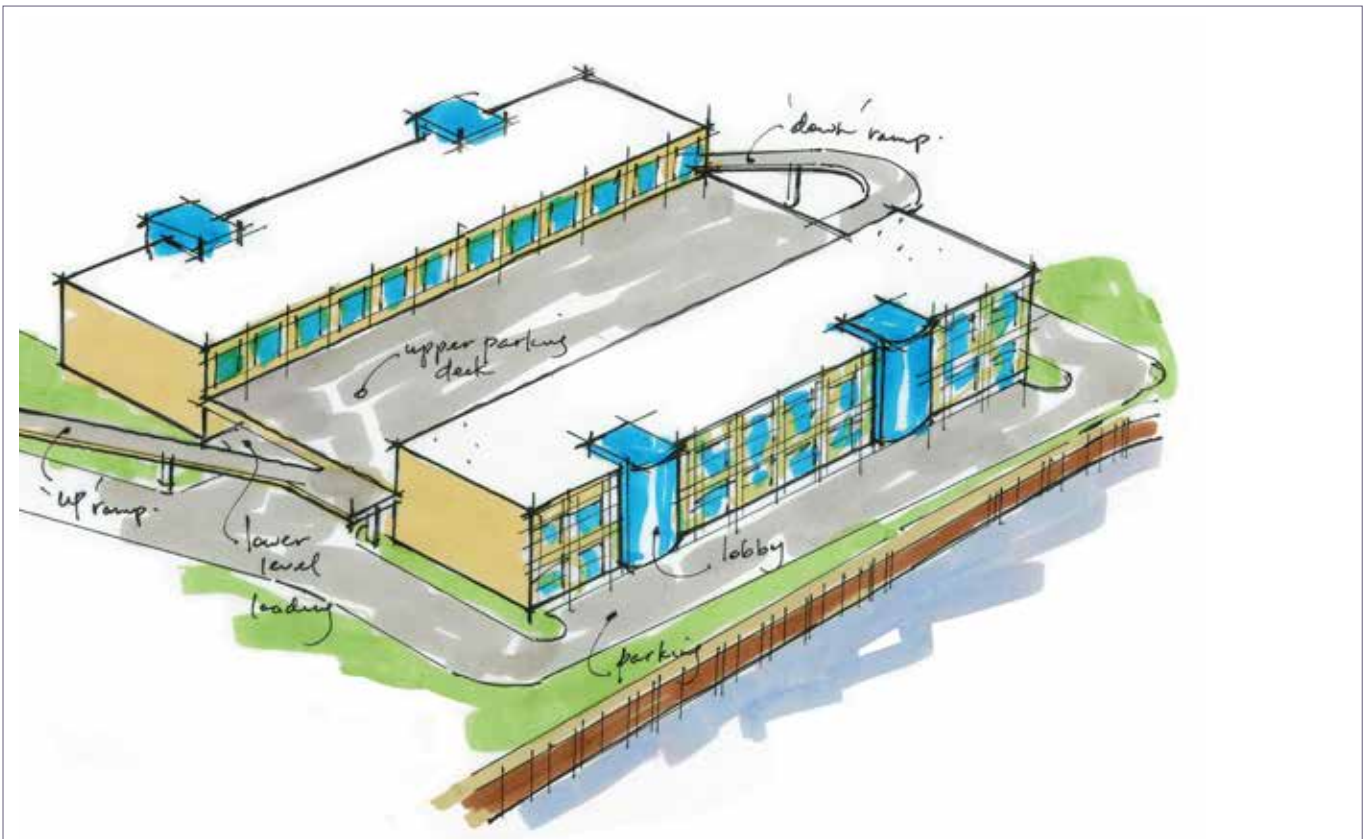
The objective of the workshops was to explore potential higher density/intensity forms and designs of industrial development and possible ways to encourage intensification. The workshops included discussions about the needs of industrial users, building design options and construction costs, transportation and access, buffers and interface issues, market and economic aspects of industrial development, industry trends, and other related matters.

The main findings from the workshops are organized by topic.

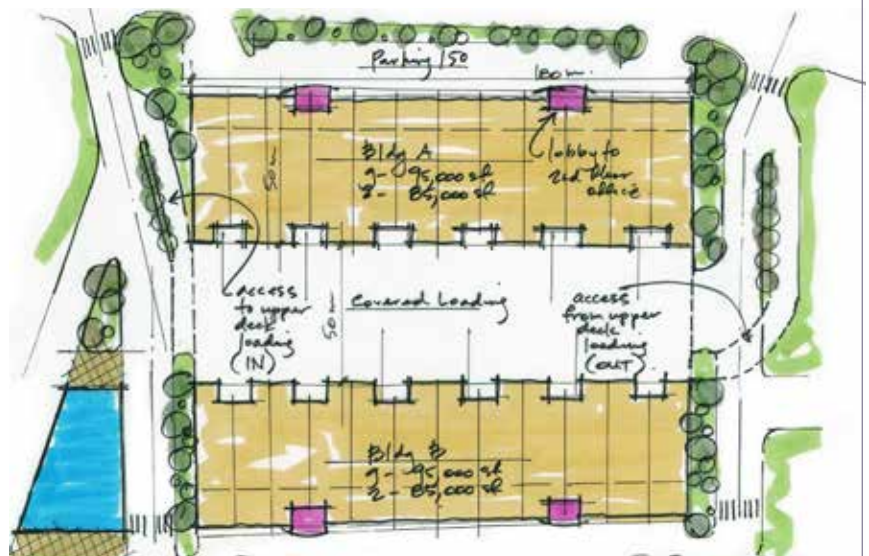
Industrial User Needs

Practical industrial business user considerations include:

- Many industrial areas may have low building Floor Area Ratios as users need significant outdoor space for loading, parking, and storage.
- Industrial users prefer single level buildings for efficient operations.
- Some businesses are consolidating industrial operations into larger facilities to achieve greater efficiencies which require large sites.
- Major industrial users do not want to be located in inner urban areas, due to congestion and potential land use conflicts, and instead prefer proximity to highways.
- Logistics facilities benefit from synergies of being located near other related uses and highway access. These locations meet their needs and remove the potential negative impacts of locating in inner urban areas.
- Some industrial uses have significant negative impacts (such as noise, vibration, smell, traffic, etc.) which can be offensive to surrounding land uses, especially residential.
- Industrial businesses do not want to have to interact with other user groups.
- Some uses can be co-located on the same site, while others cannot.



Experiences from other jurisdictions can provide lessons that can be adapted and applied to the Metro Vancouver region context. These figures show the potential for a multi-level industrial building which would accommodate a mix of industrial uses along with some accessory uses. There are few examples of new multi-level industrial buildings in North America, however they are more common in parts of Asia.



Conceptual design of multi-level industrial building with access to upper floor via ramps.

SOURCE: OMICRON

Multi-Level Industrial Buildings

Generally, multi-level industrial buildings are currently cost prohibitive from a typical construction perspective, and can also have some user challenges. In order to make multi-level industrial development possible, building uses have to be very high value to fund construction of such building designs; typically industrial uses can only afford low value rents (especially suburban locations).

Also, multi-level buildings may have design impacts on the lower floor such as increased columns to support the weight of the upper floors, or the load bearing rating of the upper floor may be limited and not adequate for some industrial uses. More columns or smaller building unit spaces may not be appropriate for larger industrial users, but potentially viable for smaller light industrial users.

Accessory and Co-Locating Uses

Typically in industrial areas certain accessory or ancillary commercial uses are allowed. Appropriate activities directly related to industrial uses, including other types of industrial functions as well as accessory office and retail uses, could be co-located where possible to enhance business operational efficiencies. The type and amount of accessory use permitted should depend on the situation.

Increased numbers of employees may require greater areas devoted to parking and more demand for transit service. Accordingly, industrial users with larger office worker components may be best located in industrial areas with frequent transit service.

The appropriate balance is to allow accessory commercial uses that increase the efficiency of industrial areas, without compromising the long term industrial potential of these industrial areas.

Economic and Market Factors

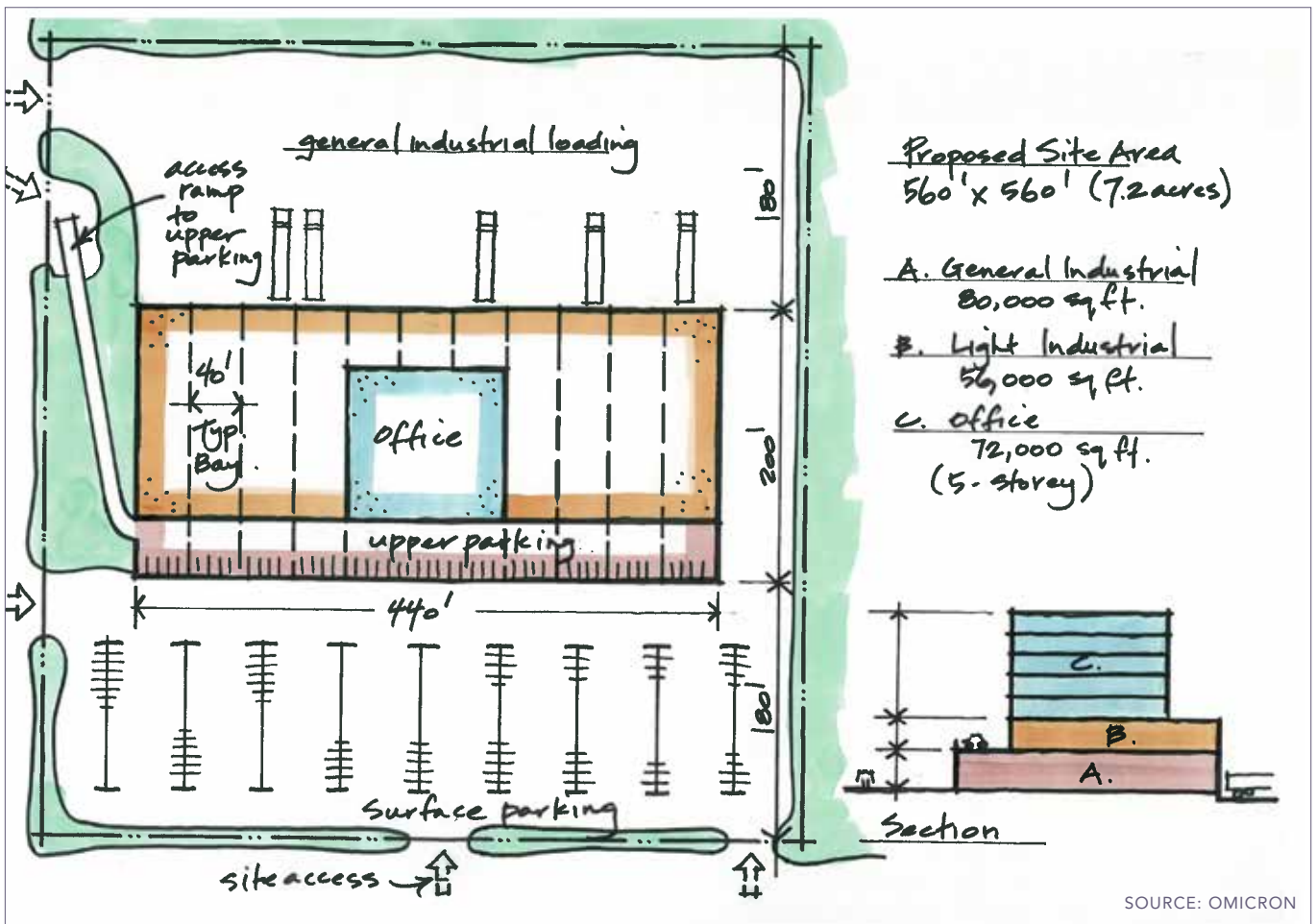
The Metro Vancouver region has expensive industrial lands and higher construction costs compared to most other parts of North America. The driver of demand for industrial development and business growth must be considered, specifically which industrial sectors are attracted to the region and how they match with the available land supply. Businesses that need to be in the region to serve the local market will have to accept higher land prices and/or adapt their building designs and operations to higher density/intensity developments.

In terms of market conditions, development and financial considerations, there are great differences between urban and suburban sites and uses, and many design and financial issues are very site specific. Different types of industries need different types of sites, buildings, and locations.

Applicability

The workshop participants shared a number of ideas about potential industrial development and intensification, including building forms and designs. This included exploring potential opportunities and challenges associated with industrial land re-development and intensification, and ideas for further exploration.

Overall, the participants expressed the importance of keeping plans realistic and ensuring that industrial development meets the needs of the industrial users. Many of the comments reflected current market and economic factors and decisions, while the focus of this paper is to explore what is possible in the future through further innovation.



Conceptual design of a multi level industrial and office building. This type of building may be appropriate on a site in RGS Mixed Employment or General Urban area with good transit service, however would not be appropriate in an RGS Industrial area. The design uses a corner lot site (although this could be adapted for a mid-block lot) and achieves a two level industrial building and five levels of office above. The multiple uses and levels are explained as follows:

- The ground level is general industrial, with rear loading industrial bays and truck loading area, along with a 10% mezzanine area. Ceiling heights are 26 ft and floor weight load capacity is 300-500 lbs/sf. Total: 80,000 sq ft of general industrial floor space.

- The second level is for light industrial uses, with single sided loading and suspended parking over the general industrial area, along with a 10% mezzanine area. Ceiling heights are 22 ft and floor weight load capacity is 150 lbs/sf. Total: 56,000 sq ft of light industrial floor space.
- The upper five levels are office, with 14,400 sq ft floorplates, and 13 ft ceiling heights. Total: 72,000 sq ft of office floor space.

Project Summary:

- Site Size: 7.2 acres/313,600 sq ft/2.9 hectares
- Total Building Floor Area: 208,000 sq ft
- Building Site Coverage: 28%
- Floor Area Ratio: 0.66
- Building Height: 120 ft
- Total Parking Stalls: 212

FURTHER EXPLORATION

This paper explores ways to increase the potential for intensive use of industrial lands through the review and synthesis of:

- Academic literature
- Best practices from other jurisdictions
- Metro Vancouver municipal industrial zones
- Case studies of industrial buildings in Metro Vancouver
- Workshops with industry participants

The paper explores current market and economic factors and decisions, while leading to potential innovation for future industrial development. Based on the extensive work summarized in this paper, the following section outlines opportunities to advance industrial intensification in the Metro Vancouver region to more efficiently use industrial lands and extend the lifespan of available industrial lands.

Lessons can be applied from examples of existing higher intensity industrial buildings in the region, and experiences from other jurisdictions, such as better building designs, greater efficiencies, flexible zoning, and appropriate plans and incentives.

Areas for Further Exploration

The following are some of the potential areas and actions that could be explored by Metro Vancouver, municipalities, developers and other organizations to encourage and facilitate industrial land intensification in the Metro Vancouver region. Metro Vancouver will work with partners to advance industrial land intensification potential as identified in this paper. Participation by all stakeholders is required to achieve successful industrial land intensification.

Metro Vancouver

- Continue researching and monitoring industrial lands supply, demand, intensification and related issues.
- Apply the Regional Growth Strategy to protect industrial lands for industrial activities as well as intensification through policies in municipal Regional Context Statements.
- Coordinate regional land use planning and transportation planning to support industry.
- Explore preparing a regional industrial development strategy.
- Explore preparing a regional economic development strategy.
- Encourage standardizing/simplifying the many industrial zoning bylaws in the region, while allowing flexible zoning to accommodate evolving industrial uses.
- Coordinate information sharing with municipalities and industry participants.
- Complete additional economic and market analysis of real estate sub-markets to create a site analysis pro forma for a number of industrial development scenarios to explore intensification viability.

- Collect and promote best practices to encourage municipalities and developers to try new ideas.
- Facilitate discussion and coordination about industrial land intensification through working with the private sector, municipalities, and other agencies.
- Explore eco-industrial features which also support industrial lands intensification.
- Develop criteria and measures for industrial land intensity and density.
- Segment the industrial sector into sub-sectors to better document industrial intensification challenges, opportunities, and potential.
- Identify industrial sectors and lands in the region with the greatest intensification potential using defined scoring criteria, considering such factors as transportation infrastructure and transit, relative viability of servicing these areas with transit, and locational efficiency of goods movement.

TransLink

- Consider high intensity industrial areas (particularly those that have higher job densities) as a factor in potential expansion or increase of transit service to industrial areas.
- Explore what types of transit levels are possible in industrial areas and how these may be impacted by intensification.

Municipalities

- Review industrial zoning bylaws to eliminate any undue regulations that may prevent higher density industrial building development.
- Review industrial zoning bylaws to ensure that the allowable primary and accessory land uses are appropriate for reasonable types and amount of uses, considering potential co-locating of related uses, while still maintaining the areas as predominantly industrial.
- Pre-zone lands for higher density industrial uses.
- Prepare local plans and development permits for industrial areas that encourage and possibly require higher density industrial forms of development, along with transit planning, as appropriate.
- Facilitate infrastructure/servicing to encourage industrial development.
- Facilitate land assembly for industrial development, where appropriate.
- Facilitate solutions to address soil contamination problems and risks.
- Facilitate solutions to address flood-proofing issues.
- Explore potential to reduce road standard widths in industrial areas.
- Explore allowing vehicle parking, loading and manoeuvring on select public roads to serve industrial users.
- Ensure industrial property taxes are appropriate to provide a competitive cost environment.
- Explore possible incentives to encourage industrial intensification.

Development Community

- Work with municipalities, Metro Vancouver and the Province to identify and address regulatory barriers/challenges to higher intensity industrial development.
- Research and explore possible higher density forms of industrial development, applying lessons from other jurisdictions.
- Work with design professionals to develop technical solutions for new industrial building designs.
- Consider the commuting needs of employees and access via different transportation modes for industrial lands development.

Provincial/Federal Governments

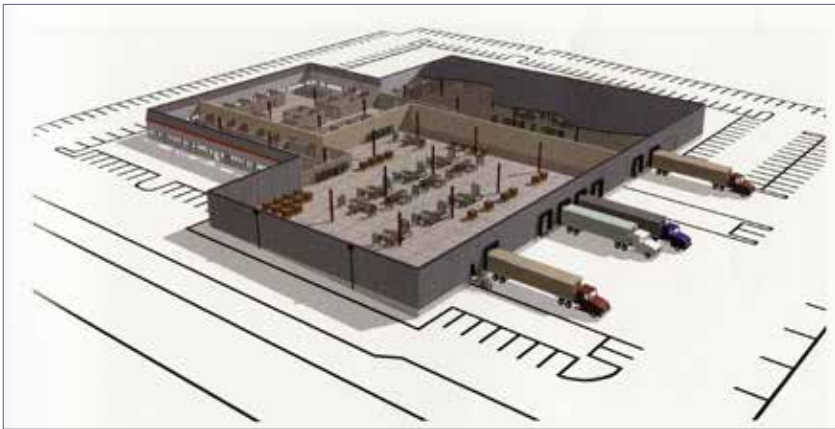
- Provide necessary goods movement transportation infrastructure to serve industrial lands.
- Review building codes to ensure that there are no undue regulations that challenge higher density industrial building development.
- Support economic development in the region which includes industrial lands development and intensification.
- Share available data about industrial land economic and employment activity.
- Explore possible tax incentives for intensive industrial uses and automated equipment investments.
- Explore possible capital gains tax exemption/deferral relating to land sales if proceeds are reinvested.
- Facilitate solutions to address soil contamination problems and risks.
- Facilitate solutions to address flood-proofing issues.

Port Metro Vancouver

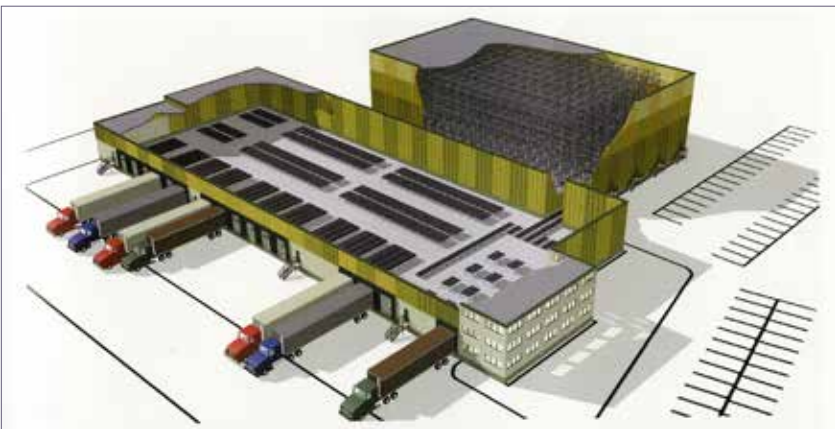
- Invest in port facilities and infrastructure that utilizes port lands efficiently.
- Encourage leaseholders of port-owned lands to invest in buildings that achieve higher densities/intensities.
- Provide leadership role in testing new concepts and sharing information.
- Link port with warehouse/logistics facilities to increase throughput and efficiencies.

REFERENCES

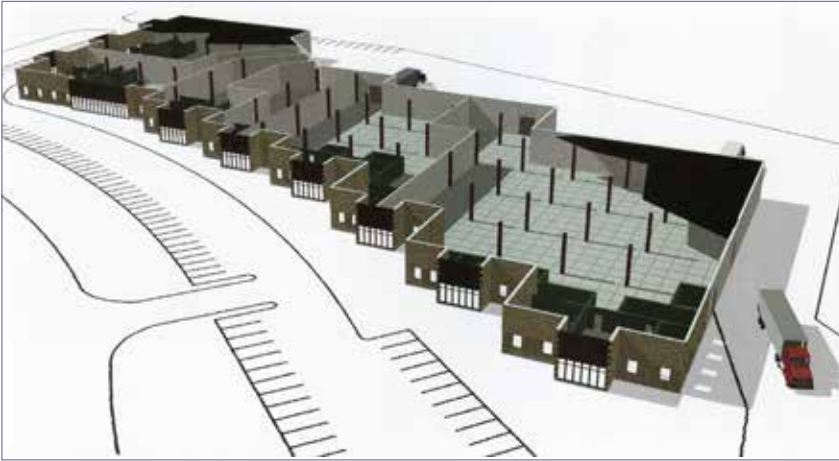
As references, the following figures illustrate different types of typical industrial buildings in North America and Metro Vancouver.



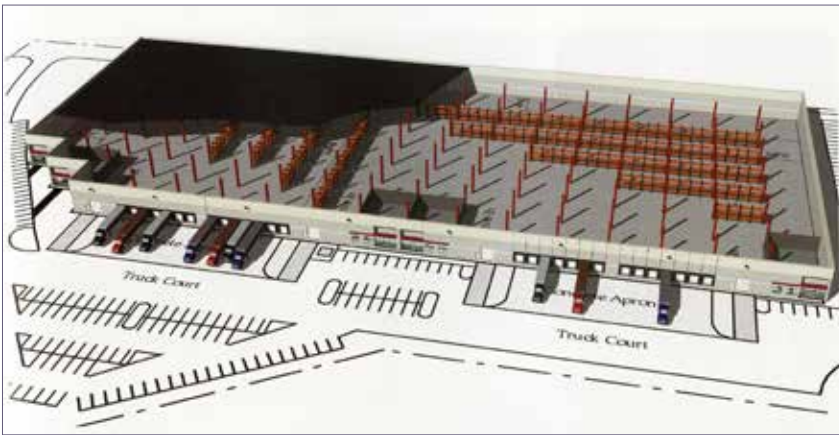
Graphic of typical light manufacturing building.



Graphic of racking warehouse



Graphic of typical multi-tenant flex space building.



Graphic of typical bulk warehouse.



Graphic of typical freight forwarding truck terminal showing significant space required for truck loading, manoeuvring and parking.

Metro Vancouver - Regional Growth Strategy Website

www.metrovancouver.org/planning/development/strategy

Metro Vancouver - Economy/Industrial Lands Website

www.metrovancouver.org/planning/development/EconomyIndustrialLands

“**Discussion Paper: Best Practices for the Intensive Use of Industrial Land**”, Metro Vancouver, October 29, 2012.

“**Metro Vancouver 2010 Industrial Lands Inventory**”, Metro Vancouver, November 15, 2011.

“**Regional Growth Strategy – Monitoring Industrial Land Supply, Utilization and Demand**”, to Metro Vancouver Port Cities Committee/Regional Planning and Agriculture Committee Joint Meeting, June 21, 2012.

“**Metro Vancouver 2040: Shaping Our Future - Regional Growth Strategy**”, Metro Vancouver, July 29, 2011.

“**Industrial Land Intensification Analysis**”, Prepared for Metro Vancouver by Eric Vance & Associates and Vann Struth Consulting Group, May 1, 2011.

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