

# EMPLOYMENT LANDS & ECONOMY REVIEW: FORECAST METHODOLOGY REPORT

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HEMSON Consulting Ltd.

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## EXECUTIVE SUMMARY

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The City of Vancouver is in the process of developing a long-range land use policy plan to ensure an appropriate supply of land and built space for businesses and jobs is available to support future economic growth. The purpose of this Employment Lands & Economy Review is to understand the diverse and dynamic needs of employment activities across the city today, identifying how the changing nature of work and other forces may affect the future demand for building space, and identifying the city's capacity to accommodate this demand through land use policies.

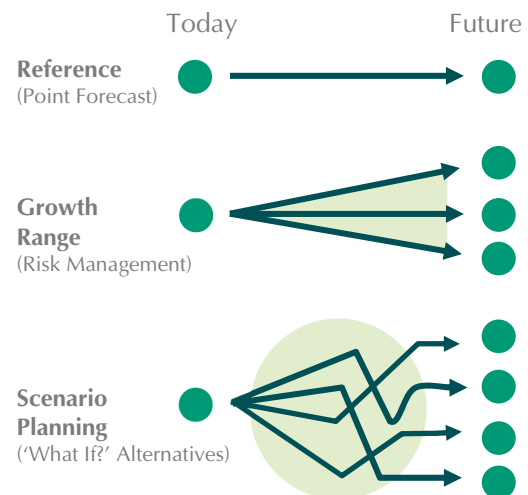
In order to understand and proactively plan for the needs of tomorrow, five employment forecast scenarios are being prepared. This *Forecast Methodology Report* summarizes the approach to forecasting for each of these scenarios, and explains how key assumptions regarding external forces will provide the Employment Lands & Economy Review with a robust range of forecast outlooks, ensuring the City is well positioned to proactively plan for its economic future.

The five forecast scenarios will build on what we know from our recent past and the trends of today, while also considering potential changes on the horizon that could shift the trajectory of growth and needs for employment space in the future at both a regional

and local level. Each scenario will forecast a total number of jobs and total amount of floor space required across four key land use categories:

- Major Office;
- Employment Areas;
- Population-related (Retail, Services and Tourism); and
- Population-related (Institutional).

Starting with a reference scenario, which represents the most likely outcome for growth based on what we know today, scenario planning is being undertaken to prepare four additional alternative growth forecasts.



These alternative scenarios were developed through consultation with various stakeholders, including one-on-one interviews and workshops with an External Advisory Group, and will consider the potential impacts of seven

key external forces that could change the amount and type of employment space that will be required in the future. These external forces include:

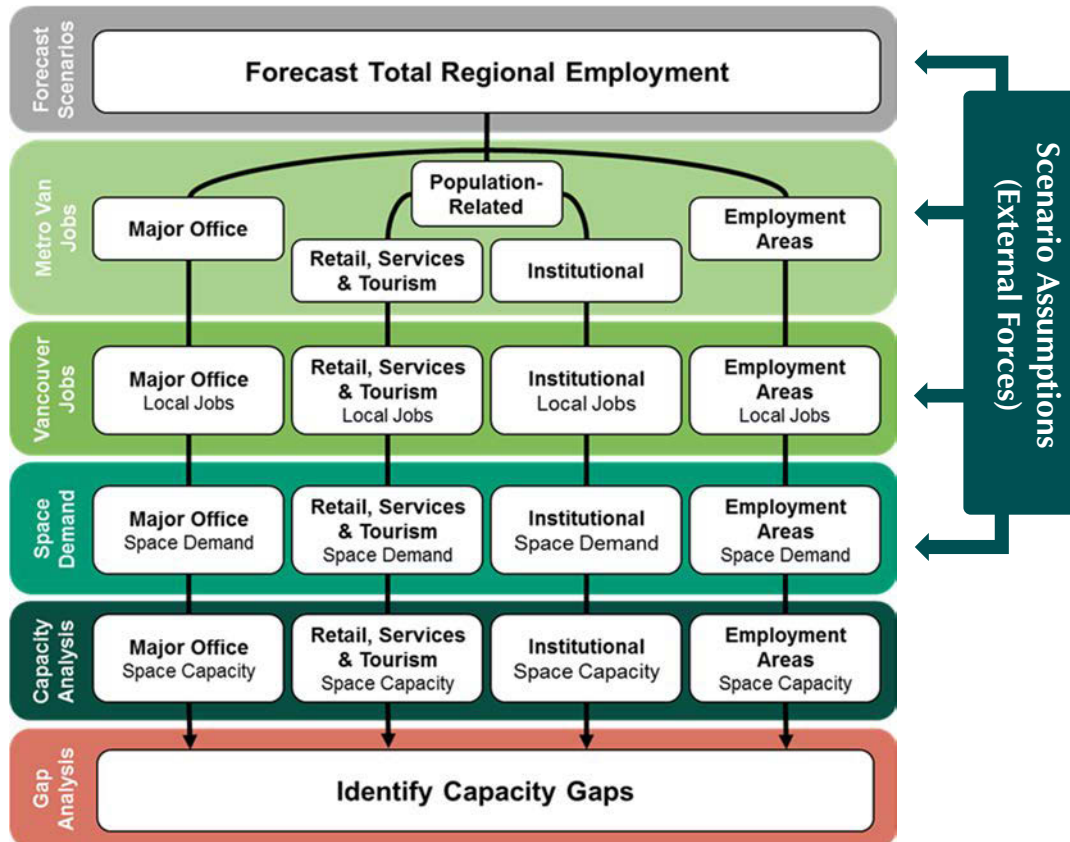
- Housing and Space Affordability;
- Changes in Automation and AI;
- The Rise of the Digital Creative Economy;
- Changes in Global Trade and Tourism;
- Alternative Work Arrangements;
- Changing Labour Competitiveness; and
- Climate Change.

The method illustrated below will be replicated for each forecast scenario,

starting with a region wide forecast of total jobs, which will then be allocated into the four land use categories at a regional and local level based on historic and assumed sectoral shares. These job numbers will then be converted into a forecast for space demand, based on assumptions for required Floor Space per Worker (FSW) in each land use category.

For each forecast scenario, assumptions related to each of the external forces will guide the number and mix of jobs, and their related space needs, for each employment land use category.

**Employment Lands & Economy Review Forecast Methodology**



For the purposes of testing the resiliency of the City’s land use policies, the external force assumptions in each of the four alternative scenarios will be structured in a manner which presents a range of forecast floor space demands relative to the reference scenario.

To do so, each alternative forecast will consider scenarios where external forces could reasonably be expected to result in greater or, alternatively, more concentrated employment space needs. The external force assumptions will also guide how demand might be allocated across the different land use categories, at both a regional and local level.

The high-level assumptions for each of the four alternative scenarios are summarized as follows:

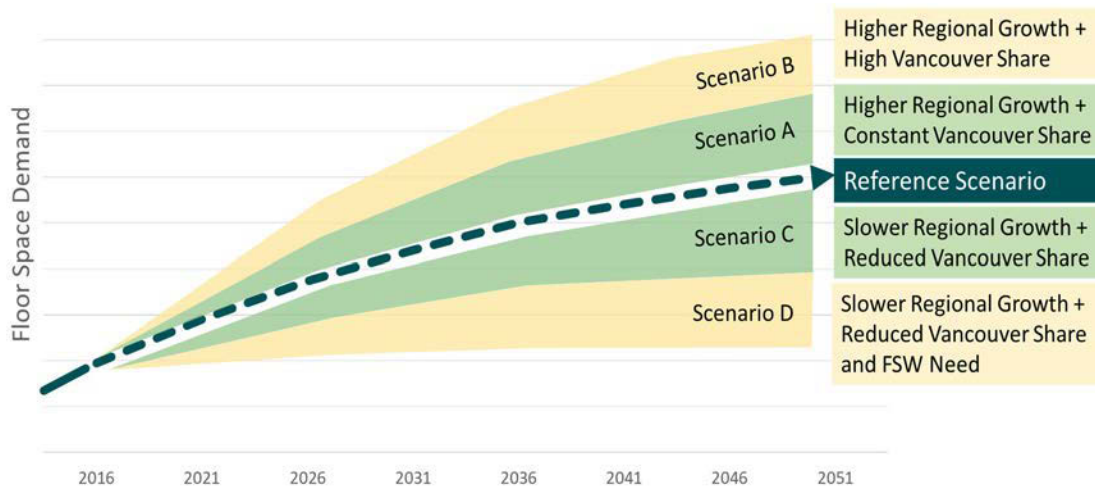
**Scenario A:** The region experiences stronger than historic growth across a variety of sectors, while Vancouver’s share of growth remains constant.

**Scenario B:** The region experiences stronger than historic growth across a variety of sectors, with growth increasingly being concentrated in the central city, resulting in a much higher demand for local employment space.

**Scenario C:** Growth occurs at a slower than historic rate across the region, and is more dispersed, resulting in a declining share of growth in Vancouver.

**Scenario D:** Slower and more dispersed regional growth is met by changing trends in employment space due to increased automation and changing preferences, resulting in a much lower demand for additional floor space in various sectors.

**Structure of Alternate Forecast Scenarios**



Note: Ranges shown are for illustrative purposes and may not represent actual forecast results.

Each of these forecast scenarios will then be tested against supply capacity modeling currently being prepared by City staff. This capacity modeling will estimate the amount of additional employment floor space that could realistically be expected to be developed under existing land use policies within the forecast window.

Taken together, the floor space demand of each forecast scenario will allow for an assessment against existing and potential land use policies, enabling the City to test the resiliency of its policies for employment land, while ensuring Vancouver is well positioned to accommodate future economic opportunities.

### **Understanding Development Capacity in the City**

In order to provide a supply-side counterpart to the demand forecast, City staff are currently preparing a development capacity model. The model will identify the potential for the accommodation of additional employment space through redevelopment of existing sites under current City land use policies.

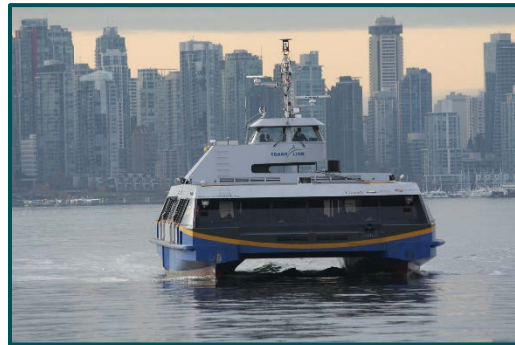
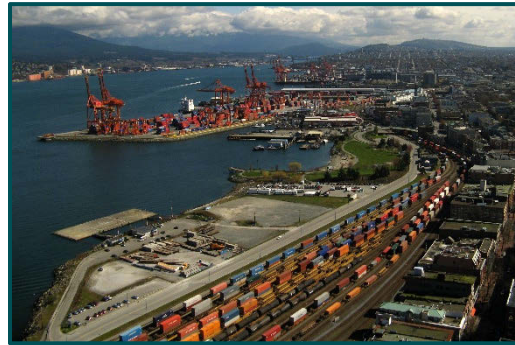
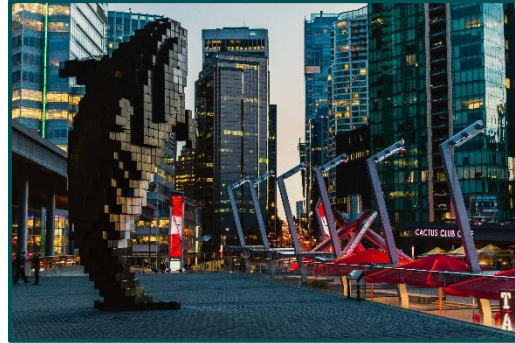
It should be noted that not all sites that are built below current land use permissions are considered realistic opportunities for redevelopment. To account for this, the model will include a qualitative assessment of site redevelopment potential to reflect a realistic expectation of the city's capacity for additional employment space.

## INTRODUCTION

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The City of Vancouver is in the process of developing a long-range land use policy plan to ensure an appropriate supply of land and built space for businesses and jobs is available to support future economic growth. In support of this objective, the City retained Hemson Consulting Limited to assist with a comprehensive Employment Lands & Economy Review. The purpose of the review is to understand the diverse and dynamic needs of employment activities across the city today, identifying how the changing nature of work and other forces may affect the future demand for building space, and identifying the City's capacity to accommodate this demand through land use policies.

Hemson is preparing a range of forecast outlooks for employment within the city and the related demand for land and floor space. This *Forecast Methodology* report summarizes the Employment Lands & Economy Review's approach to planning for Vancouver's economic future, building from a reference forecast based on current trends and anticipated growth and economic change. These outlooks will enable the City to evaluate their current land use policies against a range of possible futures, and will provide guidance for developing robust and resilient policy responses where necessary.



## Components of the Employment Lands & Economy Review

Continued population growth in Vancouver and the Lower Mainland is closely tied to continued economic growth in the region. Different economic activities have different land needs. With a limited supply of land available, employment uses are increasingly competing for space – between each other and with non-employment land use. This is particularly true for residential uses. In

the context of rising land costs and broader economic shifts, it is crucial that the City understand the outlook for employment and economic activity in order to proactively plan for future non-residential space needs through land use policy.

To address this, the Employment Lands & Economy Review involves three key components:

### Phase I: Understanding Yesterday & Today

**Objective:** Provide a city-wide overview of Vancouver’s economy and employment lands as they exist today.

**Tasks:** City staff have conducted a comprehensive review of Vancouver’s economic structure, its role in the region, and the characteristics of each of its major employment sectors. The findings of this economic ‘snapshot’ can be found on the project website, [available here](#).

### Phase II: Projecting Tomorrow

We Are Here

**Objective:** Reviewing existing policies, plans and initiatives to understand the City’s capacity to accommodate job growth, forecasting potential scenarios for employment growth, and the fit between the two.

**Tasks:** The employment forecasts discussed in this Methodology Report will provide a range of demand outlooks as part of the second component of the Review. These outlooks will then be assessed against the City’s current development capacity for additional space in order to identify potential gaps. The capacity analysis is being prepared by City staff, and will consider the maximum amount of floor space that could be accommodated on developable sites across the city under existing policies and plans. As part of this phase, Hemson will review and confirm the City’s model. In this phase of the study City staff will also prepare documentation of broader economic issues identified through stakeholder consultation to date as part of the review.

### Phase III: Policies & Actions for the Future

**Objective:** Establish policy directions and actions for the future consistent with City goals.

**Tasks:** Building upon the work of the demand-supply gap analysis, the third component of the review will seek to establish policy directions to pro-actively address potential land supply imbalances, should they be identified. In addition to the land use directions, this phase will also include identification of potential policy issues relating to broader economic development issues for future review by City staff in partnership with community stakeholders.



## Approach to Research and Consultation

In order to provide a comprehensive understanding of where Vancouver's economy is today, and where it is likely to go tomorrow, the Employment Land and Economy Review relies on a wide range of qualitative inputs and economic data. Starting with a functional analysis of economic and demographic data from the Statistics Canada Census, the review considers various sources including local building and development permits, market data from various brokerages, and academic and sectoral market reports.

This analysis is being supplemented by ongoing consultation with stakeholders representing various areas of Vancouver's economy and workforce. Stakeholder engagement includes three primary components: interviews with key industry representatives and subject matter experts, working sessions with an External Advisory Group (EAG) comprised of representatives from various economic sectors, and two surveys of local Vancouver businesses and workers. Details on each component are summarized as follows:

### Stakeholder and Subject Matter Expert Interviews

One-on-one interviews comprised of a tailored list of questions for each industry representative and subject matter expert, covering a range of topics including the general and sector-specific economic outlook within the City of Vancouver and broader economic region, opportunities and constraints, and the changing nature of work and space needs. Eleven interviews have been conducted to date.

### External Advisory Group (EAG)

Assembled to help inform the Employment Lands & Economy Review, the EAG is comprised of a diverse range of stakeholders from industry associations, labour representatives, Indigenous groups, not-for-profit organizations, development industry, and businesses from over 18 economic sectors. The role of the EAG is to provide input and insight at key milestones throughout the planning process. To date, two presentations and working sessions have been conducted with the EAG. A summary of the feedback from the first EAG session is [available here](#), while a summary from the second EAG is [available here](#).

### Business Survey and Workers Survey

Online surveys designed for businesses and individuals that are located in, or have worked in the city. Survey questions covered a range of topics, including business space needs, location preferences, the changing nature of work, and challenges facing employers and employees when it comes to finding work and expanding their businesses. A total of 684 responses were received for the Business Survey, and 2,215 responses for the Workers Survey.

Issues and trends were also informed by consultation with a Technical Team comprised of City staff from a range of departments, as summarized in the following table.

### **City of Vancouver Technical Advisory Team**

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- **Arts, Culture and Community Services**
  - Cultural Services
  - Social Policy and Projects Division
- **Chief Resiliency Officer**
- **Civic Engagement and Communications**
- **Engineering**
  - Integrated Strategy & Utilities Planning
  - Transportation
- **Finance, Risk and Supply Chain Management**
  - Long-term Financial Planning
- **Parks and Recreation**
- **Planning, Urban Design & Sustainability**
  - City-Wide & Regional Planning
  - Community Planning
  - Special Projects
  - Sustainability Group
- **Real Estate and Facilities Management**
  - Real Estate Services
  - Film and Special Events

In addition to input to the forecast scenario assumptions the Technical Team and EAG will also assist with the development and refinement of policy options in Phase III of the study. City staff are also meeting with key groups throughout the review to present research findings and discuss issues and ideas.

## **FORECASTING FOR EMPLOYMENT AND LAND NEED**

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The City has retained Hemson Consulting to prepare a range of forecast outlooks for employment land needs to test the city's capacity to accommodate future employment opportunities under current land use policies. These forecasts will serve to identify potential supply gaps, and will inform the development of resilient policy alternatives where necessary. This section is organized around the following questions:

- What are the leading practices when it comes to forecasting for employment planning?
- What forecasting approach are we proposing for the Employment Lands & Economy Review?
- What are the key employment land use categories being considered and what are their characteristics?
- How will the Employment Lands & Economy Review quantify future demand for employment in these categories, and how will it inform the policy review?



## Lessons and Leading Practices from Other Forecast Exercises

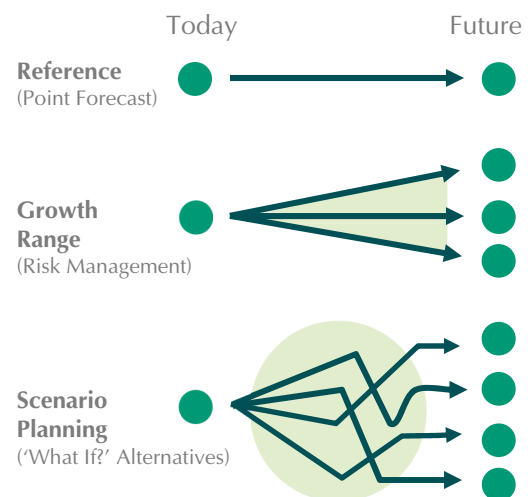
There are various approaches to planning for the future, each with their own merit depending on the purpose of their application. In order to determine a methodology that would best meet the needs of the City of Vancouver's Employment Lands & Economy Review, Hemson conducted a review of leading employment forecast practices. This review considered approaches applied in other prominent metropolitan areas across North America, including Toronto, Portland, San Francisco and Seattle.

While forecasting approaches vary based on the scope and objective of the study in question, it is typical for planning processes to start from the premise that current trends will generally continue forward within the established policy frameworks of today. These 'Reference' outlooks serve to provide a baseline idea of where growth is heading, building on what we know from the recent past with modest assumptions for anticipated economic shifts in the foreseeable future.

The future is always uncertain and any number of variables could affect the trajectory of growth for a city or economic region. To help manage some of this uncertainty, forecasts often consider a range of potential futures, building alternate outlooks which allow the testing of 'what if' scenarios.

In some cases, these alternate outlooks are designed as a 'Growth Range', representing high- and low-end alternatives to the reference scenario. This approach may be as simple as a percentage change to the growth rate, or may be built around certain assumptions, and provides a confidence interval for how growth could deviate from current trends for the purpose of policy testing.

Another alternative approach involves Scenario Planning. This approach develops a number of different outlook narratives based on external forces or disruptors that could potentially change the trajectory of growth. Depending on the narrative and assumptions in each scenario, these factors could result in more growth, less growth, growth in a different location, or possibly in a different form (i.e. different type of employment).



In the observed case studies, the approach to employment forecasting varied in scope and complexity depending on the planning objectives of each jurisdiction. A summary of the approaches and findings from each case study is as follows:

#### **Greater Toronto Area & City of Toronto**

**Approach:** Regional reference and growth range, local scenarios based on regional allocation.

In the case of the Greater Toronto Area, regional forecasts were prepared as part of the *Growth Plan for the Greater Golden Horseshoe* and were intended to guide local municipalities with land budgeting for residential and employment uses. For this purpose, the reference forecast served as a most likely outcome, with high and low alternate scenarios representing a reasonable range for confidence testing and risk management. The scope of these ranges depended on a number of key assumptions being changed regarding migration, settlement patterns and economic growth.

The forecast approach for employment allocation uses land-use based employment categories which then uses shares to assign future growth to regional and local municipalities. The approach has the benefit of directly considering the availability (or lack thereof) of land for different uses and for demands arising from population growth in communities.

The City of Toronto later used a variation of these land-use based

forecasts as the basis to plan for office and institutional floor space needs in the downtown. The City's own forecasts presented a range of scenarios related to employment allocations between downtown Toronto and the rest of the economic region. Given the purpose of the forecast was to assess possible floor space demand against land use capacity over the long term, the higher growth scenarios served as the target for ensuring the City could effectively accommodate economic opportunities.

#### **City of Portland**

**Approach:** Regional reference scenario for overall growth, local scenarios based on concentrating growth in different urban areas.

Building from forecasts prepared at the Metro level which were then allocated down to the local municipalities, the City of Portland prepared four growth scenarios based on conceptually concentrating growth in different urban areas: Default, Centres, Corridors and Central City-focused.

The purpose of the scenarios was to determine how the City might effectively and equitably distribute future population and employment growth, and to develop a framework of land use policies to accommodate growth in the desired locations and built forms. From the four scenarios, a preferred scenario was developed, building upon the Default (reference) scenario to incorporate elements of the other three in order to guide the City's Comprehensive Plan Update.

### San Francisco Bay Area

**Approach:** Regional scenario planning

As part of the ongoing update to the Plan Bay Area 2040 regional long-range plan, regional forecasts are being prepared to 2050. These forecasts will help to inform land use plans, and infrastructure and transportation investments locally and regionally.

Rather than choosing a preferred scenario, as had been done in previous studies, the project developed a number of possible futures based on external forces and their impact on population, housing and employment. Stakeholder input and technical refinements narrowed the initial list of eleven futures to three core narratives based on the following assumptions:

- *Clean and Green* – new technologies, national carbon tax, telecommuting and distributed job centres.
- *Rising Tides, Falling Fortunes* – cuts to federal spending and regulations, leaving decisions to states and regions, higher climate impacts.
- *Back to the Future* – an economic boom and new transportation options spur a new wave of development.

Under the current growth framework for the Plan Bay Area, forecast growth is primarily allocated to Planned Development Areas (PDA) for housing, transit access, and infill development, and Planned Production Areas (PPA) for long-term industrial activities and employment, with limited to no housing and commercial development.

### Seattle Region

**Approach:** Iterative small-area scenario modeling

The City of Seattle and Puget Sound Regional Council (PSRC) are somewhat unique in that they prepare small-area forecasts using a complex software model which goes well beyond traditional forecast methods. These UrbanSim models forecast land use at a micro-simulation level to predict individual decisions of households, workers, jobs, developers and land owners in relation to policy options.

This deviates from more traditional aggregate level approaches to enable area-specific testing of different policies and infrastructure investments based on assumptions in the model as to how the market would react. The benefit of this approach is that it allows for iterative testing of various different scenarios based on very specific assumptions. The key limitation of such a model is that it is much more complex than aggregate models, requires large quantities of quality data, and relies upon a very broad range of assumptions for individual actors within the system.

Generally, traditional forecasting methods tend to avoid such fine-grained modelling assumptions, as the decisions of individuals are inherently unpredictable. The UrbanSim model is still a relatively new tool, so the effectiveness of this approach is uncertain until it can be properly evaluated against updated Census and other data over time.

## Approach for Forecasting Employment in Vancouver

For the purposes of the understanding Vancouver's future employment land needs, five forecasts scenarios will be considered: a reference scenario based on current and emerging trends, and four alternative scenarios designed to test different directions that employment, the economy and built space needs could reasonably be expected to go.

Because the main objective of the Employment Lands & Economy Review is to provide a reasonable outlook for employment space demand in order to evaluate land use policy, the reference scenario will serve as the core outlook for the study. However, while the reference scenario will be designed to represent the most likely outcome based on what we understand today, no

one scenario will represent a preferred option for all purposes.

Instead, scenarios will allow a means to evaluate potential impacts and policy resiliency to future challenges and opportunities. To ensure the City is able to plan for the range of possible directions the economy could go, it is important that at least one alternative scenario demonstrate the higher threshold of potential growth and demand, while another will serve as a low end. These scenarios will serve as the bookends for the purposes of developing a policy response to the City's economic needs, and should provide a realistic range of floor space and land demand.

### Employment in the City of Vancouver and Broader Region

As the central city in a larger metropolitan region, the employment outlook for the City of Vancouver is closely tied to the outlook for the Metro Vancouver region. Economic forecasts for growth must consider the outlook for growth in the region as a whole, along with the share of employment that could be expected to locate in Vancouver.

The reference scenario will be based off of historic allocations of regional growth to the City of Vancouver, with the alternative scenarios considering factors that may affect both overall regional growth and local allocations of that growth to the city.

### Example of Possible Forecast Scenario Growth Trajectories



## Forecasting for Different Employment Land Uses

Forecasting employment for the purposes of land use policy, requires an understanding of the different needs of different types of employment. Businesses which involve activities such as manufacturing or transportation and logistics require specific building types, site layouts and access to certain types of infrastructure. These are entirely different from users that might require a free-standing office building in the heart of downtown.

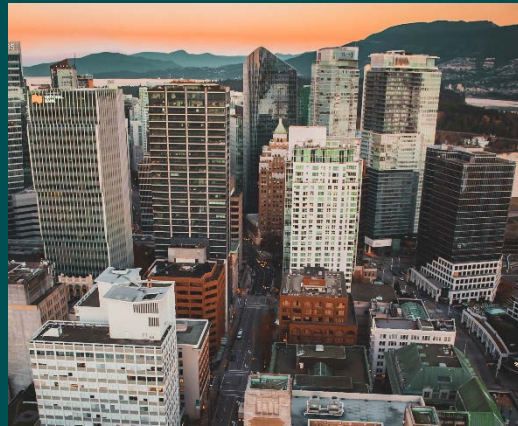
In a similar fashion, employment activities that tend to focus on serving the local and regional population, such as retail, health care, and education, tend to be more flexible in where they locate. These 'Population Related' types of employment often are quite

flexible in their land and built form preference, often being able to co-located in mixed-use buildings.

To account for these differences, the forecast considers the outlook for both jobs and the space required for future economic activity in four different land-use based categories. The demand for each category is quantified as a factor of historic allocations of employment by sector (as classified by 2-digit NAICS code<sup>1</sup>), with floor space demand estimated as an average floor space per worker in each respective category, based on space utilization trends. These categories are summarized as follows:

### Major Office

Employment uses which typically occur in large, free standing office buildings. Typically buildings of 20,000 sq.ft. or greater are included in this category. Businesses in these categories often seek a central location with access to transit infrastructure and proximity to various other amenities. Due to the agglomeration economics associated with this type of employment, it is typically distributed amongst a few major concentrations within the region; the largest by far is Vancouver's Central Business District.



<sup>1</sup> The North American Industrial Classification System (NAICS) is the standard used by Statistics Canada in classifying business establishments for the purpose of collecting, analyzing and publishing data related to the Canadian business economy.



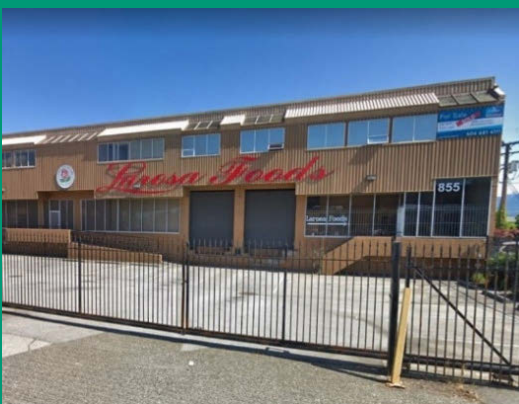


### Population Related (Retail, Services and Tourism)

This category includes employment activities that primarily serve the local resident population, along with some regional population serving and tourism related uses. Uses include retail, hotels, restaurants, and small offices. Businesses in this category can be accommodated in a range of built forms, including standalone shops, malls, and may be mixed in with other uses, including residential buildings.

### Population-Related (Institutional)

Like other population-related uses, activities in this group typically serve the local and regional population. They are distinct in their land needs in that they tend to require larger sites, buildings or campuses, and are often planned for separately from other population-serving uses. Examples of institutional employment uses include education, health care and local governance.



### Employment Areas

Uses accommodated in low-rise industrial-type buildings generally within employment areas. These often involve activities related to production, distribution and repair, which are traditionally not compatible adjacent to or mixed with residential uses. In many cases, these businesses support other businesses within the region, or may be more trade enabling in nature. Examples of employment uses include factories, distribution warehouses, vehicle repair facilities, and business parks.

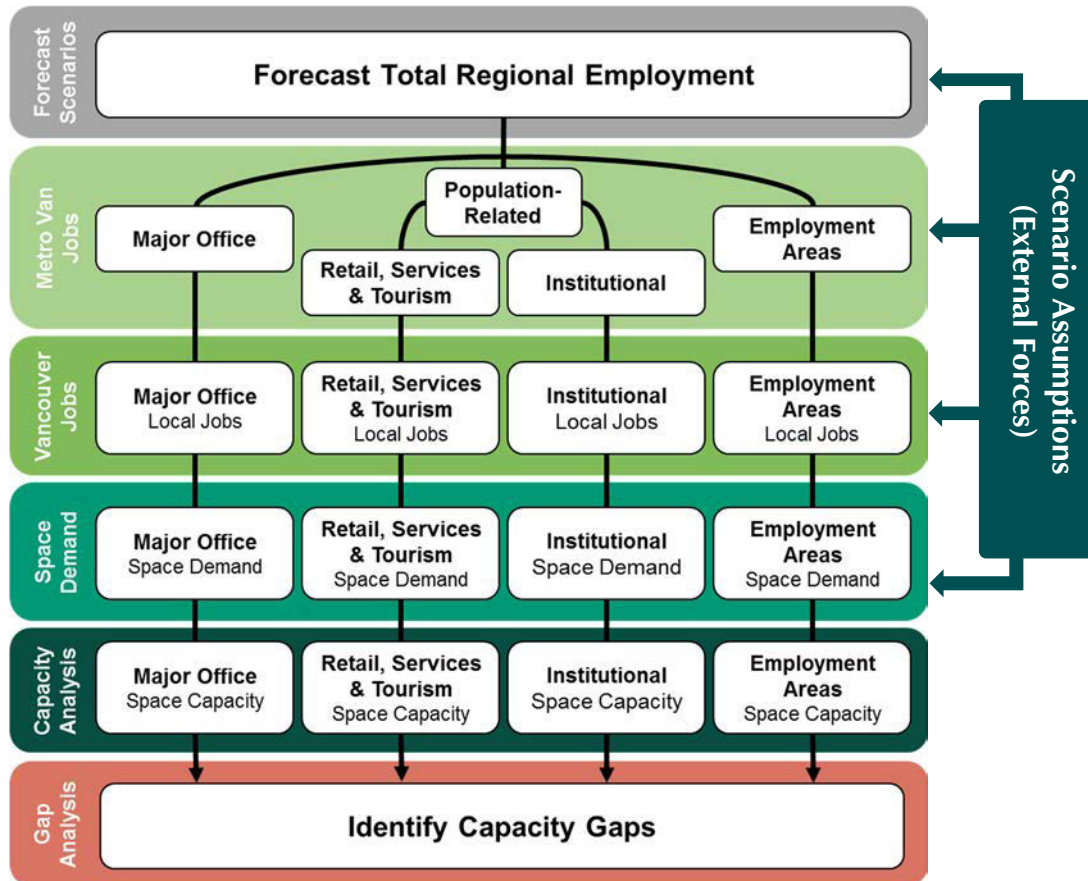
## Method for Quantifying Future Employment Demand

The approach to the forecast of employment and space growth and demand in the City of Vancouver is summarized in Figure 1, which tracks the forecast method from a broader regional economic outlook down to a forecast of employment and space demand for different land use categories within the city.

Starting with an understanding of trends and growth prospects for Metro Vancouver, a reference forecast of employment growth across the broader

region is developed (Metro Vancouver Regional Employment) from 2016 through to 2050. This reference forecast provides a baseline outlook for jobs in the region under reasonable assumptions for current trends towards the future, such as continuing floor space per worker trends due to gradual automation in certain sectors, while accounting for emerging trends and constraints which have a high likelihood of occurring, like increased climate change impacts.

**Figure 1: Employment Lands & Economy Review Forecast Methodology**



The increment of jobs is then split based on employment sectors (2-digit NAICS) amongst the four land-use based employment types used for planning purposes: Major Office, Employment Areas, Population-Related (Retail, Services, and Tourism), and Population-Related (Institutional). The share of total forecast regional employment in each of these categories is then allocated down to Vancouver, informed by historic sectoral trends and forecast scenario assumptions.

Once the local employment level for each land-use based category is established, assumptions for employment density (expressed as Floor Space per Worker, or FSW) will be used to estimate the total floor space demand by category based on a review of sectoral trends. Some of this demand may be accommodated within current stock in each land use category, while some would necessitate the construction of new space. The floor space demand metric will serve as the key output from the forecast work, providing a quantum to test against the city's capacity for accommodating additional floor space under current policies.

### Understanding Development Capacity in the City

In order to provide a supply-side counterpart to the demand forecast, City staff are currently preparing a development capacity model. The model will identify the potential for the accommodation of additional employment space through redevelopment of existing sites under current City land use policies.

It should be noted that not all sites that are built below current land use permissions are considered realistic opportunities for redevelopment. To account for this, the model will include a qualitative assessment of site redevelopment potential to reflect a realistic expectation of the city's capacity for additional employment space.

This process will be repeated for each alternative forecast scenario, making different assumptions regarding regional employment growth, sectoral splits, local allocation, or average floor space per worker in each industry, to name a few.

These scenario assumptions are based on the potential impacts of a number of external forces beyond the control of the City of Vancouver and broader economic region. As shown in Figure 1, these external forces could influence a number of assumptions in the forecast process, from the regional employment outlook all the way down to the floor space needs of specific land use categories. These forces and their potential impacts are described in greater detail in the following section of the report.

The ultimate purpose of the exercise will be to identify where gaps exist between the forecast for floor space demand and the city's current capacity for floor space development under existing policy. The identification of any gaps between these two metrics will guide the final phase of the Employment Lands & Economy Review, and policy responses the City should consider.

### Example of Key External Forces in the Alternative Scenarios

There are a number of forces that could lead to significantly different employment and space demand outlooks from the reference scenario. For example, the following forces could lead to a higher growth scenario:

- Increased overall regional economic activity across various sectors
- Increased levels of in-migration to the region
- Vancouver consistently achieves its housing targets over next 10 years
- Shift towards high-tech accelerates and results in additional office jobs
- Heightened concentration of regional jobs in the central city
- Trend towards decreased FSW in various sectors slows or levels off

The following section of this report describes the approach to alternate forecast scenarios in more detail.

## Reference Scenario and Alignment with Regional Forecasts

Metro Vancouver, in partnership with Translink, is currently preparing long-term forecasts of population, housing and employment across four potential growth scenarios. These Regional Long-Range Growth and Transportation Scenarios consider what the Metro Vancouver region will potentially look like by the year 2050, and will inform an update to the *Metro 2040* regional growth strategy and future infrastructure investments.

To ensure a degree of alignment between the regional growth outlook and the employment outlook for the City of Vancouver, the reference

scenario for the Employment Lands & Economy Review will be guided by similar assumptions as those used in Metro Vancouver’s forecast Scenario A. This regional growth scenario assumes the region will continue on a similar trajectory – a prosperous and diversified regional economy, with steady population and job growth. Key assumptions of the reference scenarios for both Metro Vancouver Scenario A and the Vancouver Employment Lands & Economy Review are summarized in Table 1. In our view these principles represent a sound basis for a reference forecast.

**Table 1: Reference Scenario Key Assumptions**

<b>Demographics</b>	Population continues to age, with most growth due to net in-migration
<b>Employment</b>	Employment to population rate declines as population ages, gradual increase in senior (65+) work force, in-migration meets labour force needs
<b>Economy</b>	Regional sectoral activity and employment remains relatively consistent, Vancouver gradually shifts towards office and population serving, while local shares of regional employment remain steady
<b>Environment</b>	Climate change impacts increase over time, including modest sea level rise and increased flooding events in low laying areas. Increased mitigation measures are required, and assumed to be sufficient to offset more significant impacts
<b>External Forces</b>	Current trends persist in most areas, employment impact of disruptors limited or offset by growth in other sectors, continued stability in policy

The alternative forecast scenarios being prepared for the Employment Lands & Economy Review are being developed to reflect local trends and issues observed in Vancouver and the need to test the resiliency of Vancouver’s land use policy to alternative future scenarios for job

space demand. As such, while these alternative scenarios will be informed by the Regional Long-Range Growth and Transportation Scenarios, they may not align directly. The approach to the alternate forecasts for the Employment Lands & Economy Review are described in the following section.

## **APPROACH TO ALTERNATE FORECAST SCENARIOS**

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To complement the reference forecast, scenario planning will be undertaken to prepare four additional alternative forecast scenarios. In line with other scenario planning examples discussed in the previous section, these alternative forecasts will be developed to enable sensitivity testing for possible policy options. The alternative scenarios will be crafted to represent possible realistic narratives where external forces change the trajectory of growth and land use in the city and region.

These external forces are trends or disruptors with the potential to change how many jobs we might expect, what sectors those jobs might come in, and the land needs those jobs might require. This section discusses the external forces with the highest potential to affect Vancouver's economic outlook, as informed by research and stakeholder consultation, and how these factors are planned to be integrated into the four alternate forecast scenarios.

### **Consideration of Key External Forces**

Through review of market forces, academic literature, and consultation with stakeholders and industry experts, the study team has narrowed down a list of external forces based on their likelihood and potential impact to Vancouver and the surrounding region. Over 20 individual external forces were noted, some being intrinsically linked, while some may be amplified or offset by the emergence of others. We have a reasonable expectation of how many of these forces may impact the economy and how they are likely to unfold, though others are more difficult to predict.

Based on our review and consultation with stakeholders, the external forces have been sorted into seven groups based on their potential to shape the direction of Vancouver's economic future. These key external forces formed the core considerations in creating and calibrating the four alternative scenarios, and will guide the employment mix and anticipated demand for floor space outlook for each forecast. These forces are summarized as follows:

### Housing and Space Affordability

Refers to various factors that are limiting affordable space for residents and businesses that may displace current residents and employers, or that might hinder other growth opportunities.

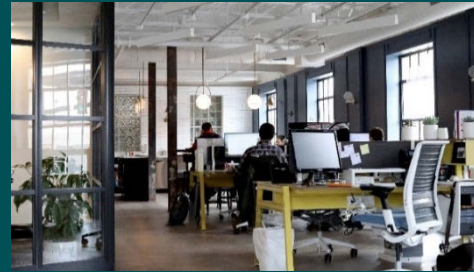


### Changes in Automation and AI

Refers to automation and artificial intelligence resulting in changing labour needs in both low and high skilled sectors. Automation of jobs in one sector is often offset by job creation in others, and does not necessary result in less economic activity or need for space.

### Rise of the Digital Creative Economy

Refers to macro-level shifts towards digital, creative and high-skill sectors, along with the impacts of increasing digital sales and connectivity on various other sectors, such as retail employment.



### Changes in Global Trade & Tourism

Refers to factors that could increase or decrease the volume and value of trade and tourism through Vancouver and its port, including policy changes or broader changes in market demand, such as a shift towards renewables over fossil fuels and increased competition from other markets.

### Changing Labour Competitiveness

Refers to the competitive advantages and disadvantages Vancouver has in attracting international business through access to high-skilled and comparatively affordable local labour.

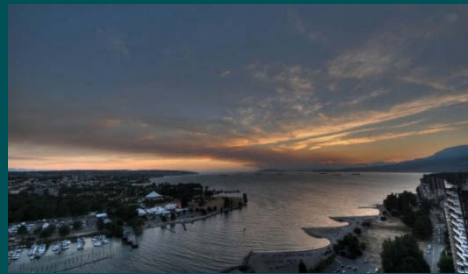


### Alternative Work Arrangements

Refers to the rise of non-traditional employment arrangements, including contract and gig-based work, as well as co-working and disruptive delivery models, such as AirBnB, Uber, and others.

### Climate Change

Refers to various climate change related impacts that could affect the demand-side outlook for employment. These include more frequent extreme weather events, including flooding and forest fires, rising sea levels, climate related migration, and increased strain on the region's water and food supplies.



It should be noted that the forecasts do not make any specific assumptions regarding the timing of any major disruptions, like 100-year floods or major earthquakes, as these events are inherently difficult to predict exactly when they will occur. However, the threat of certain weather related events becoming more common due to climate change (such as more frequent floods and forest fires) are assumed to negatively impact employment demand over the forecast window, depending on the magnitude of the assumption in each forecast scenario.



Assumptions regarding the impacts of each of these external forces inform the core narratives for assessing employment and floor space demand in each of the alternative scenarios. It should also be noted, that in addition to the demand side impacts of climate change, rising sea levels will be considered as to their potential impact on the city's employment land supply

as part of the capacity modeling. Given a significant portion of Vancouver's designated employment lands are located in flood prone areas, it will be important to recognize how much of the city's employment capacity may be affected or compromised by flooding events, particularly in the case of rising sea levels.

**Figure 2: Areas within Flood Plain**



Note: Flood plain as shown represents areas at risk of serious flooding during a 1 in 500 year flood event, assuming 1 meter sea level rise.

Source: City of Vancouver

## Alternative Forecast Scenarios

Building on the reference scenario, the objective of the alternative forecast scenarios is to develop a range of high and low outlooks to stress test the resiliency of existing and potential changes in policy.

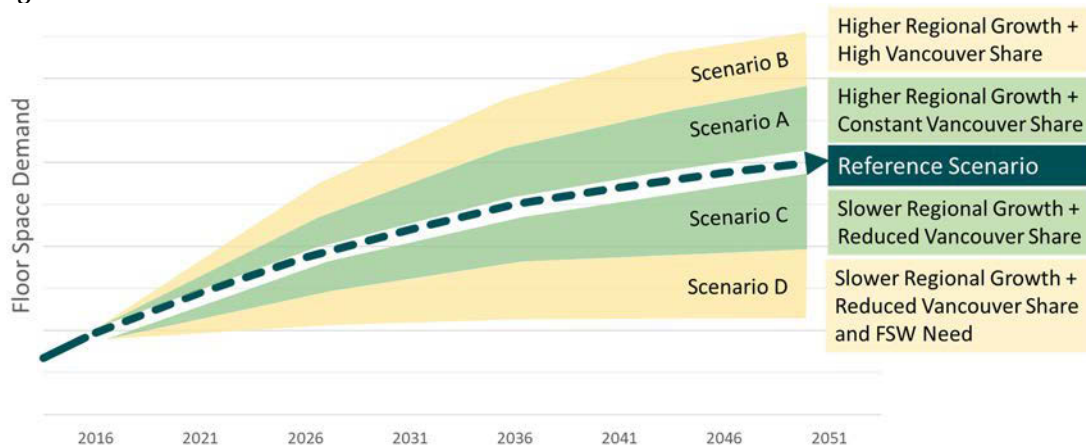
To do so, each alternative forecast will consider scenarios where external forces could reasonably be expected to result in greater or, alternatively, more concentrated employment space needs.

The range of alternative scenarios will be structured according to their potential demand for employment space. This means that a ‘low’ scenario, for example, may not necessarily result in a significantly decreased number of anticipated jobs, but may be a result of reduced Floor Space per Worker (FSW) requirements in many sectors via key external forces, such as automation.

An initial high demand scenario (Scenario A) will contemplate factors leading to higher overall growth in the region, while the City of Vancouver’s share of total regional employment remains close to historic norms. An even higher demand scenario (Scenario B) will be prepared to serve as a bookend, assuming both increased regional growth and an increased concentration of employment within the central city.

Meanwhile, a low demand scenario (Scenario C) will consider factors that could result in less employment growth in both Vancouver and the region. A bookend low demand scenario (Scenario D) will anticipate what space needs could look like if reduced employment growth was met with a reduced FSW across various sectors. The hypothetical structure of these scenarios is illustrated in Figure 3.

**Figure 3: Structure of Alternate Forecast Scenarios**



Note: Ranges shown are for illustrative purposes and may not represent actual forecast results.

With this in mind, the external force analysis will serve to guide how jobs are allocated between the different land use categories, and how much floor space is required per worker in different

sectors. A summary of each proposed alternative scenario, along with a description of the external forces that could be at play in each scenario, is as follows:

**Scenario A** (Higher Regional Growth + Constant Vancouver Share)

The Vancouver region is able to take advantage of its location and emerging prestige as a market for technology and innovation, positioning itself as a preferred location for talent in the wake of less hospitable administrations in the US and other parts of the world. Regional growth patterns remain in line with historic allocations.

**Sample key external forces that could be at play in this scenario:**

- The Metro Vancouver region becomes an even more attractive destination for global talent as rhetoric and policies in the US, Britain and other markets discourage and limit migration.
- Traditional and non-traditional office employment is expected to rise, along with some advance manufacturing and related industries as a result.
- Location preferences remain relatively unchanged, resulting in growth being distributed across the region in line with historic patterns.

**Scenario B** (Increased Regional Growth + Increased Vancouver Share)

Vancouver has adopted ambitious housing growth targets for the City in its Housing Vancouver Strategy. Achieving these targets would mean a greater concentration of regional housing and population growth in the City. Scenario B mirrors this increased concentration in the City for employment. Extending some of the elements of Scenario A, this scenario would be based on the City attracting a higher regional share of almost all employment types, including those jobs that provide services to the larger population achieved through the housing strategy.

**Sample key external forces that could be at play in this scenario:**

- A healthy mix of housing options reduce local affordability concerns for residents, creating new economic demand for a range of services across numerous sectors.
- The concentration of global talent positions Vancouver to take advantage of the rising tide of digital innovation and investment.
- In addition to continued office demand, a greater share of population-serving employment is required to support the inflow of new residents.

**Scenario C (Slower Regional Growth + Reduced Vancouver Share)**

While the general economic trends remain steady, affordability issues facing both businesses and residents limit labour pool growth, putting a damper on overall growth in the city, and to some extent the region, as many opportunities choose instead to locate further out in Metro Vancouver where space and housing is more affordable, or simply not come to region in the first place.

**Sample key external forces that could be at play in this scenario:**

- Local wages and housing supply are unable to keep pace with market prices, limiting the attractiveness of the city and forcing more resident and businesses further out.
- Limited labour availability spurs increased automation in certain sectors to offset demand.
- Non-traditional and contract employment becomes more prevalent, resulting in reduced incomes and less financial stability for some.

**Scenario D (Slower Regional Growth + Reduced Vancouver Share and FSW Need)**

While external factors could result in reduced overall employment in terms of jobs, it is also important to recognize the impact these factors could have on the demand for space itself. Scenario D serves as a low space demand bookend by forecasting a future where slower job growth is coupled with changes to technology and workplace arrangements that result in significantly reduced space needs across all sectors.

**Sample key external forces that could be at play in this scenario:**

- Policy changes amongst global competitors undercut some of the Vancouver's comparative trade and labour advantages, slowing the rate of growth for sectors, including trade-enabling uses which tend to require more land.
- Increased space costs and technological advances in automation and telecommuting enable employers to significantly reduce the floor space required per worker, lowering the demand for new space for many sectors.
- The trend towards the gig-economy and non-traditional work arrangements continues to grow, resulting in more people working from home or with no fixed place of work.

Coupled with the reference outlook, each of these alternative scenarios will allow the City to prepare a comprehensive outlook for its economic future. Considering a range of possible futures will enable for sensitivity testing when considering

existing and potential changes in land use policy, and will help to better position Vancouver when seeking to ensure an effective and resilient approach to employment land planning.

## NEXT STEPS

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The Employment Lands & Economy Review has considered Vancouver's current economic context and the various forces that have led us to where we are today. Combined with a review of a range of external forces based on their likelihood to impact the growth trajectory of the City and broader Metro Vancouver region, the reference scenario and four alternative scenarios will be modelled in the coming months.

Taken together, these five forecast demand scenario forecasts will provide a reasonable and realistic range of how many jobs and how much floor space the City may need to accommodate by 2050. For each scenario, the total

number of jobs and floor space need will be forecast by each of the four land use categories for testing against the City's capacity modelling.

Moving forward, Hemson and the City of Vancouver will test the demand forecasts against the City's potential supply capacity in order to identify any gaps between the two. The findings of this gap analysis will be published in a follow-up report, due in the fall of 2019. This report will provide guidance for the formulation of land use policy responses, should they be deemed necessary.

**APPENDIX A**  

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***STAKEHOLDER INTERVIEWS SUMMARY***

## **Stakeholder Interviews Summary:**

To provide greater detail on trends, opportunities and constraints facing specific industries and employment sectors and how they might affect different forecast scenarios, a series of interviews were conducted with stakeholders and subject matter experts. In total, 11 interviews were conducted with 13 individuals, either in-person or via telephone. Interviewees represented a range of sectors including:

- Local brokerage firms
- Healthcare authorities
- Canada Lands Corporation
- Non-residential developers and land owners
- Post-secondary institutions
- The Port of Vancouver
- National Association for Industrial and Office Parks (NAIOP)
- Members of the academic community with research on economic matters
- Local Business Improvement Areas
- Vancouver Economic Commission

Interviews were tailored to the interviewee's field of expertise, and covered a range of topics including:

- The general economic outlook for their sector in the City of Vancouver and broader Metro Vancouver region;
- Recent trends and issues that have significantly affected economic change in their sector;
- Areas of opportunity for employment and economic growth in the near future; and,
- Key challenges that are limiting growth, or may limit growth in the near future.

Information from these interviews helped to inform the scenario planning approach, including the range of external force considerations that are being incorporated into the development of the alternative forecast scenarios, and will help to define the assumptions in each forecast scenario. A general summary of the responses gathered for each of these categories is as follows:

### **General Economic Outlook**

- Vancouver is incredibly competitive in North America and globally when it comes to the cost of doing business. We have significant advantages over many US cities in this regard.
- There are high levels of interest for many firms to come to Vancouver. Recent wave of big tech firms likely to continue.
- As central city, Vancouver will always play central role in providing services, healthcare and education.
- City and region need to compete globally. Other markets may try to undercut.
- Change in consumer spending patterns. More e-commerce is raising demand for traditional employment lands for fulfillment centres and distribution.
- Film industry is strong in recent years, driving space demand for studio and production facilities.

- Enrollment trends in post-secondary often inverse of economic cycles – more people look for skills training and consider going back to school when the economy is slow.
- City is well positioned as western Asia Pacific Gateway for both port trade and as business hub.
- Limited availability of H1B visas in US is making Vancouver key destination for many high skilled migrants. Many tech firms like location due to proximity to rest of west coast innovation hubs.
- We have the talent pool and low cost of labour. Could likely go up by a large amount before we start out-pricing other markets.
- Worries that there is a lack of regional vision when it comes to economic planning.
- Affordability and mix of uses a key concern for many businesses. Mixing of uses can be very helpful but also needs to be regulated carefully to be successful.
- Current zoning and land use permissions frustrating innovation at prices that we would need to attract and retain investment.
- Lifestyle factor in attracting business to Vancouver is a quantifiable driver of growth.
- Few large scale employment sites are left in the region, with very few opportunities in the City of Vancouver proper, limiting opportunities for major employment developments.

### **Recent Trends**

- Emerging demand for clean tech requires more industrial style spaces (high ceilings, logistics bays, manufacturing space).
- Strong office development in the pipeline, but will not be available in time for many opportunities. Almost no new space available in near term.
- Downtown core of office market beginning to shift towards the east.
- Recent rise of tech market in Vancouver a big driver of space need.
- Rise of co-working space an alternative to traditional office leasing.
- Recent port related growth faster than other major global ports.
- Trend towards larger fulfillment centres, but very few locations that could accommodate them.
- Space needs are changing for institutional uses – we need more space for hospital operating rooms than we used to, post-secondary space needs dictated by programs.
- Starting to see a shift in retail models. Shift towards pick-up and fulfillment centres, food delivery, and artisan work.
- Rising assessment costs very difficult for many businesses, particularly smaller businesses.
- High demand for office space resulting in redevelopment of employment areas. Displacing other existing uses and businesses that can't compete.
- Strong growth in most industrial categories with change in dollar, decline in oil prices.
- We are still seeing increased demand in specific manufacturing sectors (food processing, textiles, design processes happening in town before spinning off globally).



- Self storage in employment areas act as a holding activity, but also support employment with no fixed place of work (contractors, etc.).
- Some instances of multi-level industrial, but these are largely purpose built – more the exception than the rule right now. May change further into the future.
- Stratification of office and industrial a concern. May limit flexibility and opportunities for future use, but too soon to say what impacts will be for certain.

### **Areas of Opportunity**

- Need space for lab space like biotech, mixed light industrial, large space for visual effects companies.
- Data storage facilities an emerging market with specific land and space needs, including increased power and fibreoptic infrastructure requirements.
- South Vancouver is the last real concentration of land available for major large format industrial and logistics businesses in the city.
- Some opportunities to mix light industry with office, but need to be careful about definition, mix.
- While we have lost some businesses over time, the ones that remain have chosen to do so because the majority of their clientele are within the city.
- Some emerging industrial users are able to work with smaller space (less than 10,000 sq. ft.).
- Many tech companies require industrial component for manufacturing.
- International enrollment in post-secondary has driven demand in many institutions.
- Protection for large format logistics space may be necessary.
- Some possibility for residential rental with employment uses. Unclear about economics or impact on other users. Likely needs to be purpose built. Would need to be very careful implementing.
- Movement of St. Paul's Health Campus to False Creek Flats creates many new opportunities for health care expansion and supporting uses and businesses.
- High level master planning for other health campuses ongoing, including VGH. Most expansion expected to be on campus, but may need additional land in future.
- Residential care facilities ancillary to hospitals an emerging factor.
- Recent infrastructure investments have helped with goods movement around port.
- Improving timeline for approvals and clarity of expectations will go long way to encouraging investment.
- Major space development opportunities with arrival of Broadway Extension of Skytrain. East-west connection a major route for potential labour access.
- Planning mix of uses and complete communities important, but need to be careful that we are not undercutting access and utility of businesses – can't sanitize too much.
- Public transportation and walkable neighbourhoods key for many businesses, particularly in retail sector.

- Still some opportunity sites available for developing major office in the Central Business District and downtown, but none are development ready. Would require demolition of existing uses and rezoning in most cases.
- Many misconceptions about industrial uses. We need to reframe how we think about them in the future.

### **Constraints and Concerns**

- Industrial lands have been almost halved in recent years by conversions and encroachment from various users.
- Record low vacancy for both office and industrial makes finding space very hard, very expensive.
- Limited space for expansion of existing businesses.
- Many factors that have driven the tech boom in Vancouver are beyond the City's control. Could very easily reverse if policies or cost of labour change in other markets.
- Not enough industrial land in Metro Vancouver region as a whole. Major constraint for port related and logistics jobs. If we can't find more space, we run the risk of losing business to other markets.
- Congestion and lack of reliable transit a concern for businesses in certain areas of the city.
- Very strong NIMBY culture in Vancouver, more so than other markets.
- Increasing density permissions may work for certain users, but may limit options for others that require space, like logistics and transportation.
- Housing affordability a major concern. Many businesses struggle to find workers that live within commuting distance. Pressure to develop employee housing nearby.
- Current land use policy protections for industrial uses are insufficient. Nearly half of industrial businesses in community anticipate being displaced in next 2-5 years.
- Getting building permits and development permits takes longer than other jurisdictions.
- Many users, including institutions, run into issues with zoning – including usage and height limits.
- Most health and post secondary campuses looking to make efficient use of their existing lands. Some may need more space in near future but land often too expensive.
- Zoning needs to be updated to permit for advanced manufacturing uses.
- Mixing of uses often leads to conflicts – even when covenants are established, businesses still struggle to operate due to having to spend so much time responding to complaints.
- Many mixed-use developers focus on residential component of projects – failing to create retail space that meets the needs of local businesses and communities.
- Not enough focus given to smaller businesses, existing operators.
- Increased stratification of industrial space makes consolidation difficult when looking to develop large format uses (logistics, port, etc).
- Influx of consumer facing operations in industrial spaces (restaurants, micro-breweries, bakeries) may be undercutting other industrial and manufacturing uses.

**List of Interviewees**

<b>Organization</b>	<b>Interviewee</b>	<b>Role</b>
Avison Young	Andrew Petrozzi	Principal and VP Research (BC)
BC Provincial Health Services Authority	Dave Ingram	Vice President
Canada Lands Company	Deana Grinnell	VP, Real Estate
Hungerford Properties	Tegan Smith	Director of Planning
Ministry of Advanced Education, Skills and Training	Kevin Brewer	Assistant Deputy Minister
NAIOP & Industrial	Beth Berry	VP Industrial Development
Polygon Homes	Chris Ho	VP Development
Economic & Planning Systems Inc.	Ben Sigman	Principal
Port of Vancouver	Marc Ballard	Manager, Real Estate
University of British Columbia School of Community and Regional Planning	Jay Wollenberg	Adjunct Professor and Principal, Wollenberg Munro Consulting Inc.
Vancouver Business Improvement Areas	Patricia Barnes	Executive Director, Hastings North BIA
Vancouver Economic Commission	Bryan Buggey Pietra Basilij	Director, Strategic Initiatives Manager of Industrial Initiatives